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Master thesis

Collecting relevant images context information

by

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Abstract

Digital photographing has become more and more popular as cameras and mobile phones get more advanced and have newer technology embedded. Manually searching in these growing image collections is problematic because of missing context information related to the image itself. If related context information could be added as an automated process, it could help the user view and locate images and information about the image.

In this thesis I propose a system that tries to collect relevant context information connected to an image using time and date, gps location and a user given *image category* taken with a Nokia N95 using mobile image capturing software like described in [1].

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Chapter 1

Introduction

This chapter will give some background information about the thesis, what motivation lies behind the work, what the problem description is, limitations and specifications, and will end with an overview of the rest of the thesis

1.1 Background

Images are taken every day by people around the world with both mobile phones and digital cameras. When the user comes home he usually would want to transfer the images to his computer for storage and viewing. But browsing for certain images or searching in this collection is rather bothersome as he would have to search for what date the image was taken on or rather just browse through the entire collection for finding that exact image which he is searching for.

Newer mobile phones with decent cameras now have built-in gps that can gps-tag the image. Image software applications as if today such as Google Picasa[22] can show pictures pinpointed on the map giving the user the ability to see where the pictures were taken. If the user would want to find any other image related context information, he would have to manually search the internet for this information.

An image itself can only hold a limited set of information about itself in its Exif header. The Exif standard holds information like time, date, dimension, orientation, if the flash was used, camera-model, gps-coordinates and so on, while there are other fields like copyright holder, comments, tags, that can be filled in during later stages of processing.

Context is defined by Dey & Abowd [2] as "any information that can be used to characterize the situation of an entity". In our situation the entity is the image, or a user searching for images that could be used in a specific setting. There are many kinds of image context information, from at what time the image was captured, where it was taken and in what context it is used in. The context information itself defines at what setting and at which

surroundings the image was taken in, which can be useful in image retrieval or context related searching. Or the context information itself can be useful to describe what the image itself can not such as what the image shows, people in the image, description of the setting the image was taken in etc.

By providing an *image categorization* at capture time, there is a possibility to classify the meaning or the setting around the image. An image category can be described as a generalized tag with categories such as "football", "concert", "architecture", "tower", and "bridge" etc. Together, the image category, location data, and date/time can possibly provide good enough data to automatically search and collect image related data. Relevancy is normally determined through some sort of distance function. *Location* relevancy can be based on the significance of distance. *Date/time* relevancy can be a distance in time, distance from capture time or a time span specter from capture point. *Category* relevancy can typically be proximity or the nearness in the category conception, or with the help of ontologies.

In this thesis we will try to develop and test a system that automatically collects related context for image with the help of an added image category at capture time, and in this way contribute to closing the semantic gap between user information request and problems regarding image retrieval search.

1.2 Motivation

As of today there are not many image viewer systems that is able to automatically collect image related context. Of those who are, for example Googles Picasa is able to show geographically close Wikipedia articles, but it does not show off the related information to the user. As of image location related pictures, the web sites such as Flickr and Panoramio are some of the most popular sites on the web today for sharing and reviewing related images.

I have previously been working on a project that involved tagging images at capture point with an "image category". The usefulness of this image category is by itself not very interesting, but put together with all the other meta data that is embedded at capture time, the combinations of this meta data could possibly provide a automatic context retrieval system enough data to find relevant related context information with the use of services and the world wide web.

1.3 Problem Description

The goal of this project is to design, develop and test out a system that automatically collects relevant context information for images based on exif information and a categorization[1] of images.

Based on the image category, together with capture context information the system will try to locate and provide the user with a collection of relevant context information. This information can include map data, weather data, location information, object information, related images and more.

1.4 Specification, prerequisites and limitations

1.4.1 GPS

GPS location coordinates is crucial for this system to work. Thereby we will assume that pictures used in this system have Exif embedded gps coordinates. Without the latitude and longitude coordinates the system will *not* be able to find any context that could be related to the image.

Gps location information for images are mostly originated from the device used for taking the image. Newer mobile phones these days now have integrated gps system that can automatically gps-tag the image at capture time. Other methods such as using computer software like Google Picasa[22] and Google Earth[18] to explicitly pinpoint a gps location and save this back to the image Exif can be used.

1.4.2 Testing

The images used in the testing part will be images that are collected from points of interest from different places around the world to see if the system will work on a general basis. These images will be embedded with an image category and gps coordinates. The images will vary from architecture attractions, concerts, sports arrangements, minor attractions and other points of interest what could be worthwhile testing out.

There is also a reason to believe that images taken at "not interesting" points will have problems to have any positive context search match with the use of "image categorization" search. This type of images will also be included in the tests.

1.5 Overview of thesis

The rest of the thesis is structured as following. Chapter 2 will go through some related work that has been done on mobile systems regarding gathering context information, and work around finding context for gps tagged images with the help of image sharing community web sites. Chapter 3 will give a overview of the design principles of the system and explain how things will work and what sort of context sources that could be utilized. Chapter 4 will give an overview over collecting relevant context information and how this could be done. Chapter 5 describes how the system is implemented and how context information are collected from the different sources with the

combination of the meta data. Testing of the system will follow in chapter 6 before ending with the conclusion in chapter 7.

Chapter 2

Background and related work

This chapter will introduce some of the terms and technologies that are related to the work in the thesis. Related work that are could be connected in different manners will also be discussed.

2.1 Context

As stated in chapter 1, Day & Abowd defines in [2] context as information that can be used to characterize the situation of an entity. Any context information that is related to an image will help identifying the image semantics meaning in what surroundings the image were taken in, where was the image taken and in what setting it was in, will all help describe the image in a way or another. Schilit et. al claims in [13] that context are the important aspects of; where you are, who you are with, and what resources are nearby. This means that one of the most valuable contexts, would be the location of where an image is taken. Date/time and location information seems to be the most appreciated image context information as of today. This can be seen in photo sharing communities like Panoramio[21] and Flickr[19]. Panoramio is an large photo community, specially developed to share images from around the world based on location.

Karlsen & Nordbotten[8] defines two kinds of image context classes; *Capture context* and *Usage context*. Capture context describes the environment that an image was taken in, while usage context describes the environment where an image is used. If these classes are expanded we can identify a variety of context information types.

Capture context can be retrieved from the capture device itself, or from a variety of sources like physical sensors or system services available as application programming interfaces to developers throughout the internet. This context is data such as, time and date, gps coordinates, temperature, wind speed and other weather related data. After collecting this context the information can by itself or chained together retrieve new context information

such as geographical location information, nearby places or maybe geographically related images.

Usage context will potentially be data collected from the document meta data content, such as title, tags, file-name description etc. For images this will e.g. be what tags an images is tagged with. Taking pictures on vacation or in combination with work will typically set the environment in what the image is related to.

2.2 Image context capturing

Håkansson et al. have been working on a concept they call *context photography*[5] where they have developed a camera software for mobile devices (they have also developed camera prototypes) where they capture additional context that surrounds the image scene. Temperature, sound, pollution, presence of others or their activity is collected from sensors and with the combination of using custom made graphic effects on the image they can represent the surrounding context in the image itself in real time. Their research also included a six week user study where seven participants would use and perceive the context camera as an photographic device. The people in the study consisted of seven people with general interest in photography. The results of the study were that the context photography added innovative ways of associating context to photography. Making the users expecting to get visual effects in their pictures. Pictures that showed no effects would not be a considered satisfactory context photograph. This made the users be more creative in taking pictures that would be more artistic.

2.3 Mobile device camera annotation

In the paper *Photo annotation on a camera phone*[6] and in [7] Sarvas et al. describes a system that allows users to annotate digital photos at the time of capture. With the use of networked mobile camera phones it provided the creators a platform for creating an infrastructure for networked cameras to allow users to assign meta data at the point of capture, and to utilize a collaborative network. Together with automatically captured environmental cues the system were to aid the users in automating the annotation process, reducing the effort required by the user. The system is based on a client-server architecture where the user takes a picture which is sent to a server together with automatically captured location meta data such as GSM network cell ID, phone user name, time and date. Then the picture is matched against a repository of annotated images, where the server has generated annotation *guesses* and returned this to the users mobile phone for confirmation of correction. These guesses were computed from any previous submitted information. The system were tested on 40 students and

15 researches with ongoing interactions where they learned that the mobile camera enabled a new approach for annotating media that could reduce the user effort in three ways. Facilitating meta data capture, adding meta data automatically and using networked collaborative meta data resources.

Anguera & Oliver have created a mobile-phone prototype called MAMI (Multimodal Automatic Mobile Indexing)[11] who allows users to annotate and search images taken with the mobile device with the use of speech. The images are captured with the mobile device and the user has the opportunity to store a speech annotation at capture time or at a later stage. The system also stores meta data such as time and date, location, user identity and image-based features together with the image. The system is a mobile application who runs without any server, but images can be uploaded to a remote server(MAMI Database) if the user wants. Anguera & Oliver points out in the paper that the use of speech has been claimed to be a natural input modality for mobile phones. This because of as phones computation capabilities increases, so does the complexity of the type of applications that can be run on them. But the mobile devices have their limitations in browsing and inputting information on them with a smaller screen size and slower text input than a regular desktop system. As speech recognition systems mostly operates in a specified domain for a given vocabulary, they use a *pattern matching metric* for speech search. The system thereby does not need to figure out what the speech annotations *mean*, and additionally is domain and language independent.

2.4 Geo- and geo-event-based tag collection from photo communities

Spirittagger[10] is a geo-aware tag suggestion tool created by Moxley, Kleban & Manjunath. They have created a tool that utilizes Flickr and their large collection of geographically tagged photo data. By combining tag re-ranking based on geographic context with content-based image analysis they are able to suggest geographically relevant tags for photos newly tagged with GPS coordinates. The tags suggestions that the system provides can help users organize their photos or help in image retrieval.

Quack et.al. describes in [9] an approach for mining images of objects from community photo collections (such as Flickr) in an unsupervised fashion. The system retrieves geo-tagged photos from web-sites that uses a grid of geo spatial tiles. These images are then clustered together into entities of interest through processing such as visual, textual and spatial proximity. The result of this is analyzed and automatically classified into objects and events. These objects and events are then labeled using mining techniques before finding a corresponding Wikipedia article. A final process verifies the link with the Wikipedia article using content and images.

2.5 Augmented reality

Augmented reality is a term for merging live or indirect view of physical real-world environment with virtual computer-generated data. Augmentation is usually done with real-time imagery and in semantic context with the environmental elements. This makes it possible for information about the environment and objects to be used as an information layer on top of our real world view. Good examples of augmented reality can be taken from a broadcast of a football match. Whenever there is a free kick situation on the field, an arrow can appear from the free kick spot to the goal showing the distance to the goal. Another example in the same situation is a circle around the free kick spot viewing the 9 meter distance opponents have to remain outside of.



Figure 2.1: Wikitude application running on an iPhone.

This technology has now reached the mobile market and is available for users for various mobile systems. Mobilizy have developed a software for Symbian, iPhone and Android mobile systems called Wikitude World Browser[16]. This software makes the user able to use the mobile devices camera as a "looking glass", where the user uses the camera for retrieving information about objects. Figure 2.1¹ shows the application running on an iPhone, standing in Piccadilly street in London, England. It is achieved by using mobile built-in technology such as data from GPS, compass and a movement sensor. The sources they use are Wikipedia, Yellow Pages and the user community Wikitude and makes this application a sort of travel guide that is usable all over the world.

¹Image taken from article "Wikitude World Browser - First Look" - <http://www.augmentedplanet.com/2009/10/wikitude-for-the-iphone-first-look/>

Applications and projects such as Around[14] and Nokia Research Centers MARA(The Mobile Augmented Reality Applications) have also looked into augmented reality for providing location/environment information and viewing friends within the camera frame.

2.6 Web Page Classification

Web page classification or Web page categorization, is the process of assigning a Web page to one or more predefined category labels. The Web page classification problem can be divided into more specific problems; subject classification, functional classification, sentiment classification, or other types of classification. In our matter the interesting part is subject classification, as it is concerned about the subject or topic of a Web page. This is the matter of judging whether the page is about "arts", "business", "history", or "sports" or maybe combined categories.

Qi & Davison examines in [12] the space of Web classification approaches in the role of information management and retrieval tasks. It is traditionally posed as a supervised learning problem, in which a set of labeled data is used to train a classifier that can be applied to label future examples. Textual content, visual analysis, neighbor features, and URL analyzing are some of the methods used for classifying web pages. Of the textual content methods, the use of bag-of-words and N-gram representation are widely used.

2.7 Tagging

A tag is in general a keyword or term type of context, assigned to a piece of information or data usually in the form of words or other identifying marks. This meta data helps to describe an item, and helps in finding the item by browsing or searching. Tagging are also done to perform functions like aiding in a classification manner, and are generally created by the items creator or viewer.

A very good example of adding tag context to images can be seen at Flickr, a incredibly popular image sharing community. Most images are tagged with many words and described with a title and description. Through tagging and descriptions, image collections can be detected. Here relationships between images can be detected by time spans, location information, descriptions or tags. Without this context information the ability to doing context based image retrieval is useless.

2.8 Image categorization

An image category is a type of manual tag, and can be described as a generalized tag, neither too descriptive, but short enough to describe the image

object. With normal tagging of an image a user would most probably use multiple tags, keywords or proper names to describe the image and surroundings. If a user was on vacation in Rome taking a picture of the old amphitheater Colosseum, the user would most probably tag the picture with at least "Colosseum". If the user was using image tags active for searching and retrieving images from his collection, other tags could have included at least "vacation" and "Rome". Also normal image tagging is usually done at a computer at a latter stage to taking the picture itself.

In the autumn of 2008 I worked on a project[1] creating a camera application for the Nokia N95 mobile phone. The goal of this project was to create an image capturing application that would allow the user to easily input an "image category" for the image that was about to be taken. The process of inputting the information were to be easy and some pre defined categories were included, together with a custom option where the user could input his or hers own category. Figure 2.2 shows the camera application running on the mobile phone. The image category would then together with gps location information be written to the JPEG image Exif header, for future use. The intention was to use an image category together with the gps location and time and date as a query for an automated context retrieval system. This query could then be used in a search to retrieve any relevant or related context information.

Image categorization in this matter is intended to be added prior to image capture, and in this work an images category will aid in the search for related context information.

As of today Googles Picasa[22] can map picture locations to a map, show related images through Panoramio[21] and nearby Wikipedia[20] articles on the map through Google Earth[18]. But there is no way of searching within this information, here search is done by searching filename and image exif information.

2.9 Contribution

The work in this thesis will differ from other in the way that we will combine images with a pre tagged user selected image category at capture time, with an automated post contextual relation search through different sources.



Figure 2.2: Camera application

Chapter 3

Design

This section will describe the overall design layout of the system and what kind of context sources that are intended to be used and how they can be used.

3.1 Overview

The general idea of the system is to import images from a user and use image Exif header information from each image to perform searches to find related context information.

Figure 3.1 displays a figure of all the components in the system. The intended image origin are those taken with a mobile device with an image capturing software with a image categorization like the one described in [1]. With this software, the images has Exif embedded information like; time and date, gps coordinates, and an image category which the user has selected at capture time.

The system that will utilize this information will have three connected components. A context information collector(from now on called CIC) system for automatic collection of image context information from the images Exif header information. A database for storing image data and data that is collected for an image in the CIC. And at least, a web server that will act as the users front end to the system where images and collected context information will be displayed to the user.

The choice of using a database as storage of the information is of its ability to store large amount of information and the ability to make relations between data which makes both insertion and retrieval of data less complicated than using either file storing like CSV(comma separated value). As an image Exif header only can hold a limited set of information, the possibility to store this back to an image is not reasonable. The possibility for having the system storing some information like location name and weather data back to the image Exif could though be considered. Additionally having

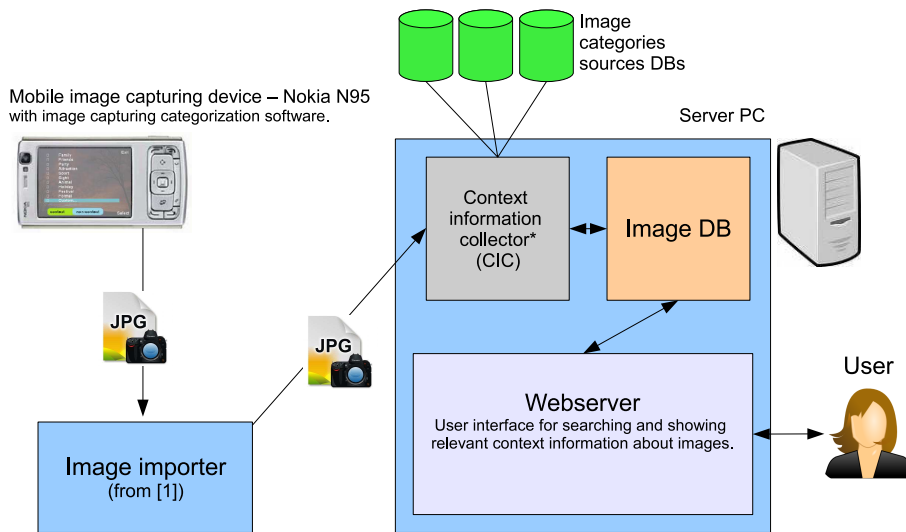


Figure 3.1: Overall system layout.

stored the data in the database, makes it easy to retrieve and display this data from a general-purpose scripting language like PHP (PHP: Hypertext Preprocessor¹).

The web side will be the users interface to the system, figure 3.2 displays how information could be presented to the user. Here the user will be able to show what information the system has found for each image, maps, related images from the same *geographical area or location* can be added from Flickr[19] or Panoramio[21]. In addition a search field could be added for searching the images in the system. The choice of using a web interface as the front-end makes the user software independent, and current web developing tools almost provides the same functionality from a web browser as a stand alone application can provide. This makes the system usable from any computer that has a internet connection, and makes the system accessible from any location, like while on traveling or vacation. The possibility of having a multi user setup where each user has their own account on the system is also possible. Today more and more applications are moved and developed for the web for easy access and seems to become a popular way of reaching users. Using PHP as programming language the system can utilize online APIs to e.g. gather and show Flickr/Panoramio location related images on the fly for a selected image, and could be used add dynamical content to the page.

The process of an image will work like this;

1. The user inputs the directory location of the images to be processed through a web front end.

¹<http://php.net/>

2. The CIC will then copy the images to the *context information collector* program directory for local storage and extract the jpeg image Exif information time and date, GPS location and image category and insert this in the database.
3. The CIC will then process the images, meaning that it will use the data from the exif header with the context sources to collect location information, sensor data and other information that could be related to each image and store this back to the database.
4. The user can now display the images and collected context information in the web front-end.

3.1.1 Context

As described in chapter 1, context is "any information that can be used to characterize the situation of an entity". Context adds information that the image itself can not provide, and even if the information itself is not used to anything specifically, it makes the possibility of doing image retrieval through search possible. Drawbacks can though be having too much context information or the matter of having unrelated information which in this case would provide false results in image retrieval searches. More information and discussion around context and related context information will be found in chapter 4.

3.1.2 Usage

The systems range of use could be seen from two sides. One, the user of the system is only interested in information about the image target. Two, the user of the system is interested in information about the image target and the surroundings. This can be described in these scenarios:

Scenario 1: A user is attending a football match in a city at a specific date. The football match is held at a well known football stadium, but the user is only be interested in information about the football result and teams.

Scenario 2: A user is on vacation and taking pictures in an area with lots of tourist attractions. The user is interested in information about the image object and surrounding attractions.

In either way of the users expectations to the system it will try to locate information , the image categorization context search will include sources of error

In *scenario 1*, the user has an image from a date specific event. This means that the system will have to do a search combining location, image

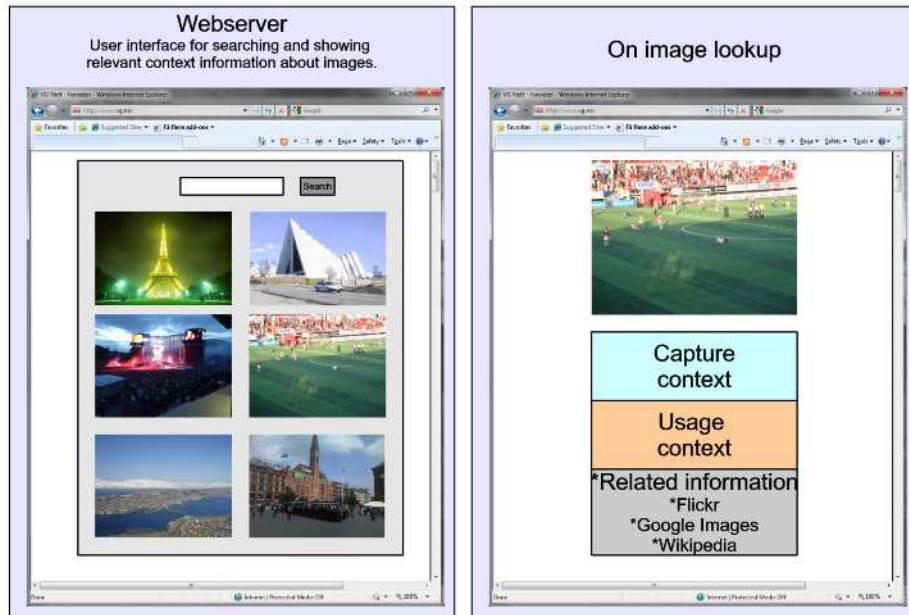


Figure 3.2: Overall user design layout.

category, and the date of the capture. The date variable will here be crucial for finding any information that can be informative for the event. This will include trying to locate context data such as pages which include the result of the football match, which also could include team lineups and other match statistic and information. A search for date and location specific images through Flickr is also possible for finding images taken at this exact location for the given time period.

In *scenario 2*, the user has an image from a location and even if is date specific it does not necessary have to be included in a context search. In this case, the system will do a search combining location and image category. Here the search for the specific object is the main target, while nearby points of interest can be found from using a Wikipedia through Geonames search(more on function this in section 3.3.3.). Flickr and Panoramio can provide related images from the given location that is either non date specific or date and time limited.

As mentioned above, information that is collected and displayed to the user will be based on location, image category, and date/time where needed. Location related information like nearby objects of interest will not necessary be the information the user wants to see, but will still relate to the image in a locational matter, but will possibly be excess information for the user in *scenario 1* because he is just looking for object related information. The

excess information and the actual wanted information could be "separated" by adding a rating system for the collected info. This can be achieved by parsing the retrieved information and having it rated by content. This means that the system can parse through the collected information and rate the occurrences of the "image category". This makes it able to value some of the collected information more than others, but in the end the value of the relation between the collected context information and the image will have to be determined by the user himself. This is because of performing a filtering process will not necessary rule out all of the none wanted information and rate the rest as relevant.

3.2 Context information collector

3.2.1 Requirements

The requirements for the context information collector needs to meet are:

- Extract meta data from image
- Retrieve a location name from given gps coordinates.
- Collect weather data from area for given time and date.
- Locate Wikipedia articles from area and rate these.
- Combine meta data from image in a query in search engines and rate these.

The above list describes in short terms what the CIC needs to do and is displayed in figure 3.3. The CIC needs to extract the Exif data from an image and store this information in the database along with an identifier that connects this information to the image. As soon as the Exif information is extracted, the CIC will use this data in a series of services and sources that are listed in the next section. The data can be collected from web services directly or by parsing specific pages and grabbing the interesting information through a html parser. The preferable way is to use web services because of direct access to data and not having to trouble with different character sets as parsing web pages can induce. Another negative way of parsing web pages is that the design of a web page can change and then the parser customized specifically for that page needs to be revised and adapted to the new design. More discussion around collecting relevant context information from the image Exif meta data will be found in chapter 4.

3.3 Context information sources

As of context information sources, there are some that are more available and open than others. Some of them have a developers API available, so

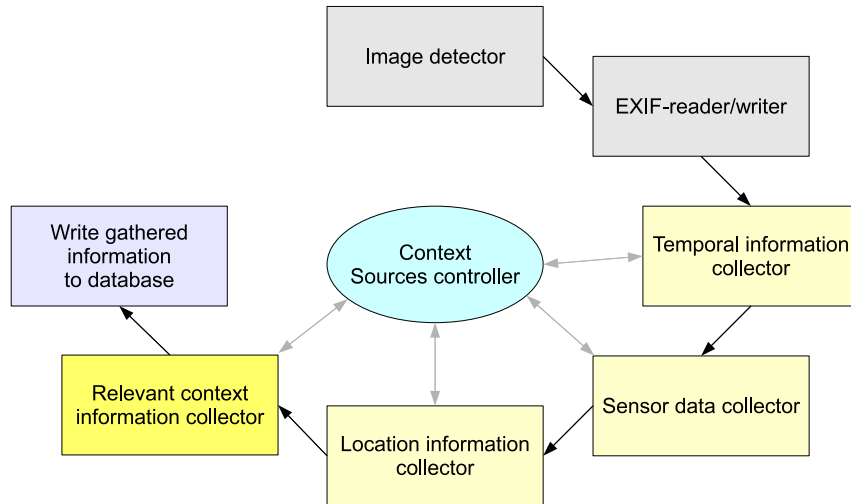


Figure 3.3: Content of context information collector.

direct access to their data through web services can be used. Those that are not available through an API can be extracted through doing a web parsing of the specified site/url to "grab" the information that is needed.

3.3.1 Google Maps

Google Maps[17] is maybe the first that comes to mind when someone thinks of internet related map data. The Google Maps API lets anyone embed Google Maps in their web page with JavaScript. Their API provides a number of utilities for manipulating the maps and adding content to it and is widely open for everyone to use.

This service will be used to provide maps with pinpointed location of the images which have geographical tagging.

3.3.2 Geonames

Geonames[23] is a geographical data base that is available through a various of web services. It is licensed under a Creative Commons attribution licence²and is also downloadable, so developers can set up their own database with the data and query on it locally. The database contains over 8 000 000 geographical names of places in a variety of languages. The data set also include geographical latitude and longitude data, which will be useful

²<http://creativecommons.org/>

for finding out location names of where an image was taken at, also called reverse geo-coding. This can be used for finding locations that again can be used for finding weather data for a given location. If the location itself is not enough for finding weather data, it can possibly be used for finding the nearest airport where the airport ICAO³ code that can help out to retrieve weather data.

These services can if wanted, be used to pull out city and country data if that was needed to show information about the city and country either from a relayed Wikipedia search or another search.

3.3.3 Wikipedia

Wikipedia[20] is maybe the number one free, non-profit, web-based multilingual encyclopedia available on the web as of now. The articles in Wikipedia can be extremely valuable as a context source, if the search criteria can correspond to get the correct and relevant information.

The geonames API provides searches in Wikipedia articles through searches called *findNearbyWikipedia* and *WikipediaSearch*. The geonames database contains Wikipedia related articles for locations since the geonames periodical performs a synchronization of the Wikipedia gps-tagged articles. Wikipedia currently have an own project⁴ of people working on geo-tagging articles to better organize information in articles, and as this continues it can make future searches better in a way of locating location related data. Figure 3.4 shows a world map of number of geo tagged articles for every country in the Wikipedia article database.

This source can be used to find image related articles that can add locational context information.

3.3.4 Flickr

Flickr[19] is an image and video hosting web site, and online community platform. It is a very popular site for users to share their personal photographs and at the time of writing the site claims to have an estimated 4 billion images.

Flickr also provides a developer API for non-commercial use. This can be used to search for images within a given location pinpoint and will be used to search for pictures taken within the same area that could be of interest to the user of this system. They also provide a lot of other services⁵ such as reverse geo-coding for finding out a location name for a geographical location, but

³ICAO airport code, or location indicator is a four-letter code that designates each airport around the world.

⁴http://en.wikipedia.org/wiki/Wikipedia:WikiProject_Geographical_coordinates

⁵Full list over API methods can be found at <http://www.flickr.com/services/api/>

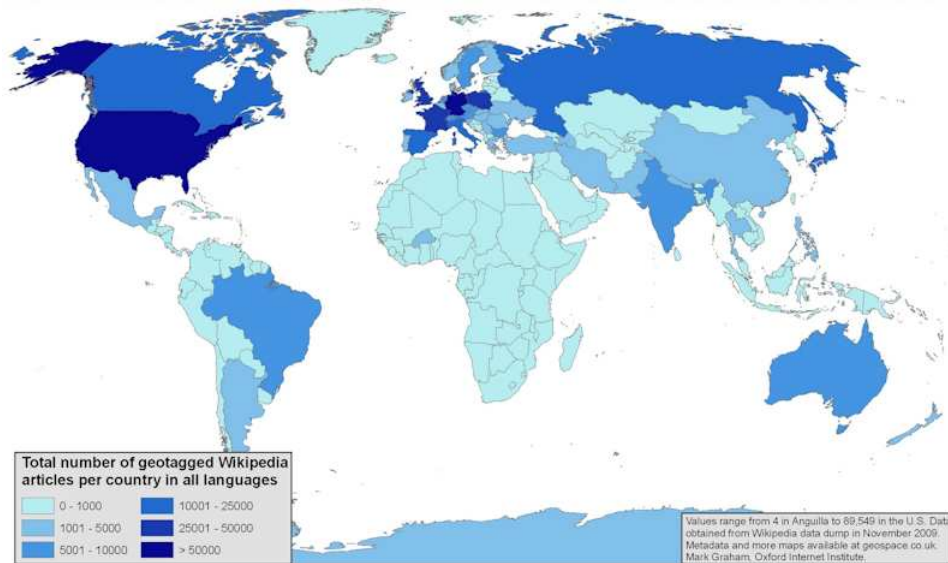


Figure 3.4: Location mapped Wikipedia articles.

they state that this should not be used for this matter. This function which is called *flickr.places.findByLatLon* has a level of detail from 1 to 16, where 1 is world level, and 16 is street level. Table 3.1 displays an example of a gps coordinate search in Flickr for Trondheim, Norway.

3.3.5 Panoramio

Panoramio[21] is a geolocation-oriented photo sharing web site by Google. The sites goal is for users to learn about a given location by viewing photos that other users has taken in the same area. It is quite similar to Flickr, but does not have the same user mass and the framework is not as rich as Flickr provides to its users. Panoramio also provides a developer API that allows pictures to be retrieved from a geographical location.

3.3.6 Weather Underground

Weather underground[24] is a weather information web site that provides users with weather conditions and forecasts for locations across the world. They also have the possibility to search for historical weather data as far as 1997 back in time for many locations.

They provide an API for developers that services current weather conditions and forecasts, but do not include historical data. That means that their site has to be crawled for finding approximately weather conditions for a given image. This can be done by finding the nearest airport and looking up weather conditions for the given date with the ICAO code.

Level	Location type	Location name
1	country	Norway
2	country	Norway
3	region	Sor-Trondelag
4	region	Sor-Trondelag
5	region	Sor-Trondelag
6	county	Trondheim Kommune
7	county	Trondheim Kommune
8	county	Trondheim Kommune
9	locality	Trondheim
10	locality	Trondheim
11	locality	Trondheim
12	neighborhood	Marinen
13	neighborhood	Marinen
14	neighborhood	Marinen
15	neighborhood	Marinen
16	neighborhood	Marinen

Table 3.1: Level of detail in Flickr location name gps coordinate search in Trondheim, Norway.

3.3.7 WordNet

WordNet[26] is a large lexical database of English. Nouns, verbs, adjectives and adverbs are grouped into sets of cognitive synonyms or synsets, each expressing a distinct concept. A purpose of using the WordNet database could be to provide help for the image categorization context search. The search is done by parsing the HTML page where a search for a word has been done, collecting any synonyms for the search term.

Chapter 4

Collecting relevant context information

This chapter will give a discussion about the different types of context meta data what we are working with and how to combine these in different manners to locate related context information.

4.1 Overview

Relevant context information will in general be information that relates to an object in either way. The meta data from the image provides the system with a time and date, gps location and an image category. From the gps location the system can be able to find out at what location the image is taken at. The sources Geonames and Flickr provides web services for finding location information down to a very narrow point. Time and date provides the system with a point of capture, giving the system together with a location name the ability to find out what the temperature was in that location on that day and even around that specific hour. The image category will provide the system with a generalized name of the object or the surroundings the image was taken in. By combining these three information sets the possibility for finding more related data is there.

4.2 Image category

The image category is the most describing meta data about the image that we can extract. The image category tells us something about the image, at what occasion it is taken in or what the category the object is within. It tells us something about what the image show and at the same time it tells us something about what the image does not show. This information can typically be used in a matter where an image is taken at a location where there are numerous points of interest. An example of this can be a museum

located by a beach and an image is taken at the beach by the museum, the image is taken with an image category "beach" and not "museum". This information will then be useful for filtering out the museum as direct related information, but is still related to the image regarding its location.

A category like "architecture" can be used for a number of objects and describes the object as a member of the "architectural" word family. This term includes words like "butchery", "restaurant" and "theater". The image category that is selected for an image should describe the image in a general matter, meaning that taking images of the "golden gate bridge" should go under the category bridge and not architecture. This gives the image a more descriptive category and is a better selection for the system which will mean that the system can be able to find more relevant information than the more general term "architecture".

As discussed in chapter 2 section 2.6 we have web page classification where there are some approaches trying to classify what sort of information is on a web page. This classification can be seen in aspect with our own image categorization. In an ideal world the possibility for locating web pages with the same category as an image would be useful. Figure 4.1 illustrates this matter, where an image is used in a search and web pages with the same category or classification would create a match. This assumes that the categories on both sides is able to be compared in a way or another.

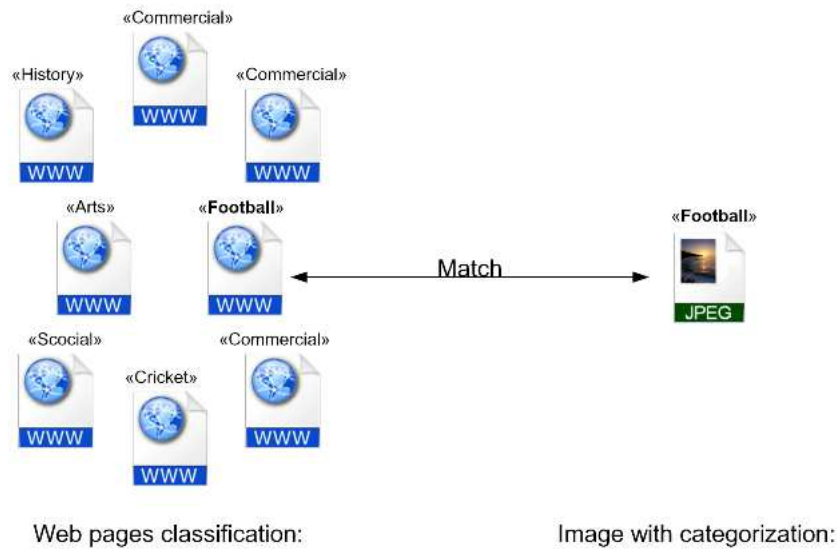


Figure 4.1: Image and web classification matching.

4.3 Location

The location information is maybe the next most important information data for doing a search for related context. The name of the location pinpoints the image to that specific spot on the map. There are though different strengths and weaknesses in the name itself. A very detailed location name will be very descriptive for where the image is taken at, but in an automated search this could be both good or bad depending on the environment the image. The name can show itself to be either too wide or too narrow to produce any good results in an automated search. An example of this can be an image from a football match in Oslo. Oslo currently have three top football clubs and even more in the lower divisions, and they all play at different locations within Oslo city. Using a too wide span of a location name will produce the name "Oslo" from a set of gps coordinates within the city, while using a medium to a very narrow span will produce a name of the area or neighborhood. This produces the problem of at what level the location name should be retrieved from. The possibility is to test out what generally works and what does not, or having the ability to adjust the location name after the system has automatically selected one. This is a problem that will be tested in chapter 6.

4.4 Time and date

Time and date tells us when the image is taken, but does not necessary need to be used in a related context search. An image of a beach in Thailand with a image category "beach" does not need a date in a search for related information. But if there was an event like a surfing competition or another form of happening at this location, the date would have to be included in the search query for trying to locate this event specific information. If the search had been carried out without the date, the possibility for finding related information to this event would have been minimal. This means that the date variable should be used in searches which includes specific events, concerts, sports events, and football matches to narrow the search results to those which includes date specific information.

4.5 Location related images

Locating images from the same area as an image a user has taken can provide new information that the users image has not captured in his own image. A good example of this could be that the user had taken an image of a building from outside, the located images from that area could then include images from the interior of that building. The possibility of seeing multiple images of the same object or area from different angles can provide an overview

about the object or area that the user was not aware of, accordingly the possibility to see what others have written about the images and what tags they used can help looking up specific information related to the object or area in a latter manner.

The possibility of defining to show only images taken between two specified dates makes it also possible for the user to gain a historical view of the image, meaning that the user can travel "back in time" and see what the place looked like at a specific date, given that users of the image community used for collecting these has provided images from that location.

4.6 Combining meta data

The combination of the different meta data is the key for finding related context information. Figure 4.2 shows how combination of these data can be combined together in searches to collect context from available context.

A gps location will give us a name for the location and together with the time and date data this can be used for finding the temperature for the area at the point of capture. The same data combined can be used for finding images taken by others at the same date from Flickr[19] within an area of the original location. Or the location information alone can be used for finding location related images both from Flickr[19] and Panoramio[21].

Combining location data, image category e.g. "Football", could produce information about football teams and football stadiums within the location. Combining location data, image category e.g. "Football", and date could be able to produce information about events in area and maybe the concrete event the image is taken at.

4.7 Relevancy

Relevancy is normally determined through some sort of distance function. But to determine relevancy in our matter we have to determine how pieces of information relate to each other. *Location* relevancy can typically be based on the significance of distance. *Date/time* relevancy can typically be distance in time, distance from capture time or a time span specter from capture point. *Category* relevancy can typically be proximity or the nearness in the category conception, or with the help of ontologies.

Determining the relevancy of the collected data can be supported by information filtering. In this case the most important filtering option that is available is the image category. The image category does not include glitches that an automated location name process can induce, and can provide a filter basis for rating of the collected information.

The context search sources are; Wikipedia through Geonames, Google, Bing, Yahoo, and Wikipedia free text search. Since the Wikipedia articles

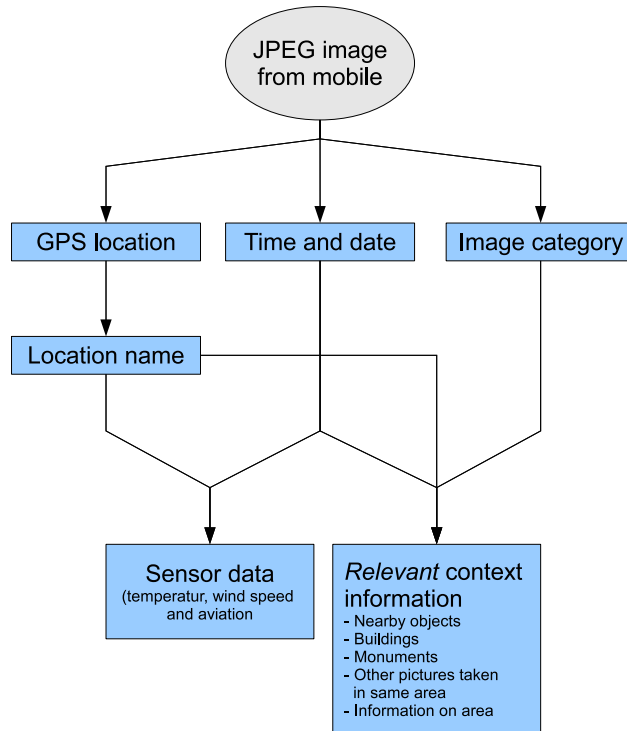


Figure 4.2: Context data collection hierarchy.

that are gathered from the Geonames API search are already limited to the location specific area, they are somewhat already confirmed as location related. By providing an image categorization filter upon these, the ability to rate these articles of image relevancy is possible and makes the system able to give reasonable information.

Google, Bing, and Yahoo could also produce related context information, but will introduce noise to the results, meaning that the appearance of unrelated information like web sites for hotel and car rental, commercial sites and other unrelated web sites could be encountered in the results. These sources will induce sources of error to the system, and even though the system rates the web pages that are collected, the level of relevancy the filter provides will in the end be up to the user to decide. The Wikipedia free text search brings commercial-free search result information, and represents a more clean and direct source for information and knowledge. If the location name that is collected is somewhat correct, this makes the system able to find articles from Wikipedia that are not geographical tagged and not retrievable through the

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Geonames Wikipedia search.

Chapter 5

Implementation

This section will describe the system implementation in a not to detailed manner. The first sub chapters will describe what kind of software that is used and later how the system is set up, combined and the uses of the context sources to gather context related information.

5.1 Software

The system is implemented and tested with the listed software set-up:

5.1.1 Web server

The web server are set up with Apache HTTP server version 2.2 and with PHP version 5.3.0 for being able to dynamically communicate with the database and context sources.

5.1.2 Database (MySQL)

The database are set up with MySQL version 5.1.39-community for communication between the CIC and the web server.

The database will have tables like:

- image
- wikiarticle
- related
- tags
- settings

The image table needs to hold data like filename, date time, category, temperature, gps latitude, gps longitude, location name, country, ICAO code

and tags. The majority of these are gathered from the image Exif header, while `location_name`, `country`, `temperature`, `tags` and `ICAO code` are gathered through using data from Exif in context searches.

The `wikiarticle` and `related` tables will hold data like `title`, `URL`, `summary` and `value` of parsed context information that is done during a context search. The `value` will hold the rating this piece of information has according to the image category of the image.

The `tags` table will hold a finite number of weighted tags that are collected from a geographical area around the image.

The `settings` table will hold the an image directory that the user has input from the web front-end.

5.1.3 MySQL

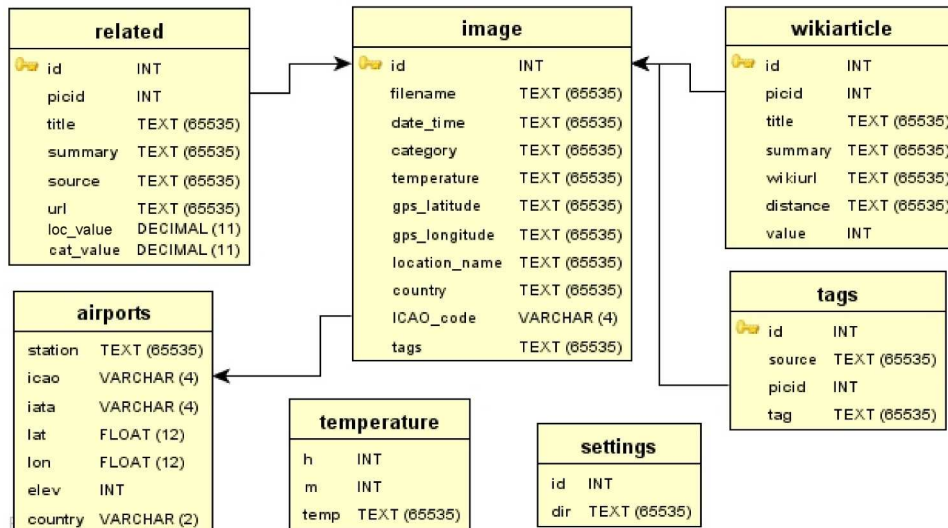


Figure 5.1: Mysql data model.

Figure 5.1 shows the database and the relations between the tables. The table `temperature` is a temporary holding table for storing temperatures that are grabbed for a given airport from Weather Underground for finding the temperature for the given hour. It is not used by the other tables in the database, and just used for querying and finding the temperature for the nearest hour. The table `settings` has two values `id` and `dir`. The `dir` variable is set when the user posts a new image directory in the web front end. The CIC uses this variable to find the images and will reset this value when the images in that folder is processed.

5.2 Context information collector

The CIC can be developed in almost any kind of programming language, but the decision fell on Ruby programming language¹ because of it has easily imported libraries through its `rubygem` plugin`includegraphicsfootnotemark`

Ruby Version 1.8.6

Ruby libraries:

Geonames Version 0.2.2

exifr Version 0.10.8

mysql Version 2.8.1

hpricot 0.8.1

JSON 1.1.9

flickrwrap 0.7.1

The context information collector consists of these classes:

ContextHandler Class for handling all of the context gatherer classes.

CategorizationHandler Class for handling the image category context gathering.

DirHandler Class for handling file related operations.

DatabaseHandler Class for handling MySQL database operations.

ExifHandler Class for reading Exif meta data from images.

GeonamesHandler Class for gathering place names, country and geographical related articles from Wikipedia with geonames as source.

WeatherHandler Class for finding temperature for a given image at geo location at given date/time.

Figure 5.2 displays the composition of the classes in the context information collector.

The *ContextHandler* class will in turn use the connected classes in the following sequence:

- Retrieve file list from database set *upload directory variable* from the web front end.
- Extract exif meta data such as *image category, date and time, gps coordinates* from an image and add this to the database.

¹<http://www.ruby-lang.org>

¹<http://www.rubygem.org>

- Retrieve geographical information using *GeonamesHandler* for extracting *location name*, *country* and *Wikipedia articles* that relates to the image gps coordinates.
- Retrieve weather data for the gps coordinates and image taken date and time, using *WeatherHandler* class.
- Using *CategorizationHandler* if will first use an images gps coordinates to create a bounding box around the image making four new gps coordinates that is used in a Flickr and Panoramio search to retrieve the most used tags for images within this geographical box. Then the terms *image category*, *date and time* and *location name* are used in a HTML parser for search engines for extracting possible related context information.

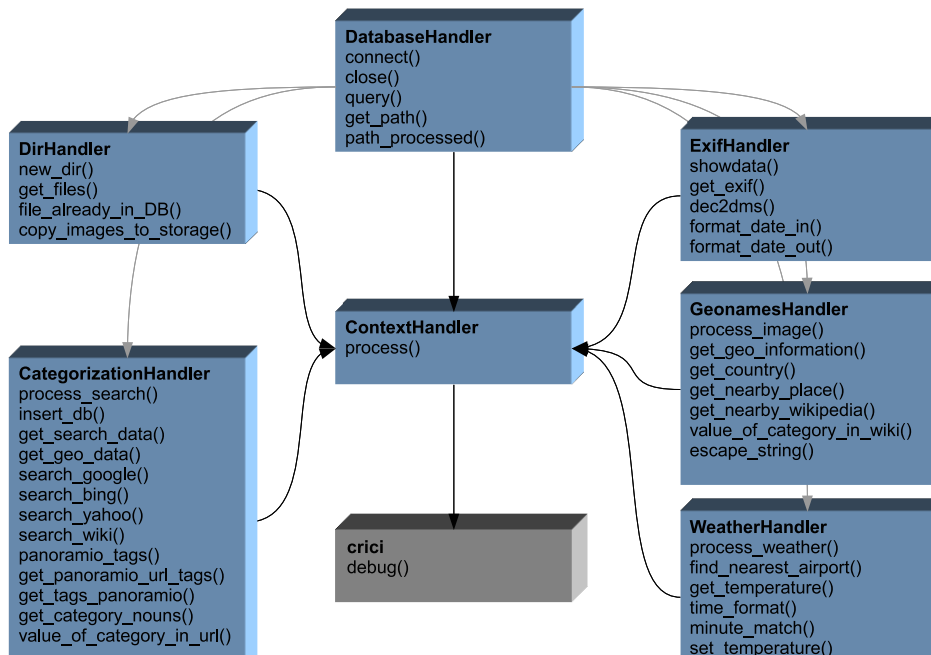


Figure 5.2: Classes and functions in the system.

5.2.1 HTML parsing

Some of the context sources does not have a developers API and to get data from these the CIC needs to make a HTTP call through the sources search field and parse through the HTTP page to select the given search results and store these. This can be done with the use of the *hpricot*²html parser library

²<http://wiki.github.com/hpricot/hpricot>

for ruby. Hpricot can parse through HTML code and find exact pieces of text on a page with the use of either *xpath*³ or *css* searching.

The downside of scraping HTML pages like this is that it is dependent of the host not changing the layout of the pages that is scraped. Once changed, the parser needs to be reconfigured to be able to fetch the right information.

A xpath is short for "XML Path Language" and is actually a query language for selecting nodes from an xml document. In this case the xpath is used with HTML pages, and can be extracted with the use of the Firebug⁴ that is an addon for Mozilla Firefox⁵ web browser. The xpath of an HTML document can be seen like a tree structure of the document. Figure 5.3 displays the use of firebug with a Wikipedia search results page for finding the xpath of a result listing.

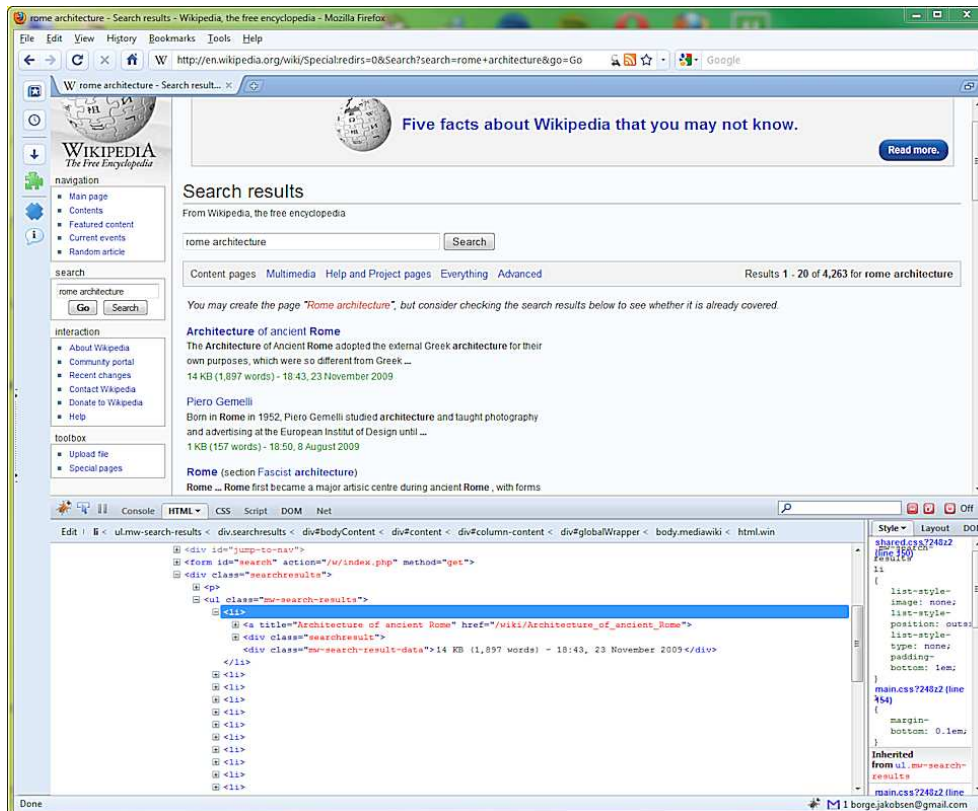


Figure 5.3: Using Firebug to extract xpath of a Wikipedia search results page.

³<http://www.w3.org/TR/xpath20/>

⁴<https://addons.mozilla.org/en-US/firefox/addon/1843>

⁵<http://www.mozilla-europe.org/en/firefox/>

5.2.2 Google Maps

The Google Map section is embedded on the web page for an image through javascript code. On an image lookup on the web page, the PHP code will search the database for the image id and gather the gps coordinates and put this into the javascript which will embed the map.

5.2.3 Geonames and Wikipedia

The geonames web services *findNearbyPlaceName* and *findNearbyWikipedia* are used in the search for location name and to find possible Wikipedia corresponding articles. The location name service will reply with the nearest possible location name. Doing a search for nearby Wikipedia articles from a gps coordinate, provides a list of articles from Wikipedia with a *distance from* variable. This variable indicates how far away from the coordinate the article has its coordination set at.

5.2.4 Panoramio

The Panoramio is used for finding images from the same area as the image the user is currently looking at. Either by generating a map through Google Maps with embedded photos on geo locations, or just having the images for a given area showing.

Showing a map with embedded images at geo locations is nearly the same as embedding a Google Map.

Finding geographically related images is done by doing a PHP call such as:

```
file_get_contents('http://www.panoramio.com/map/get_panoramas.php?order=upload_date&set=full&from=0&to=20&minx=' . $minx . '&miny=' . $miny . '&maxx=' . $maxx . '&maxy=' . $maxy . '&size=thumbnail');
```

There is some possibility to define the search by showing pictures by upload date or popularity, different sizes on the images, and a bounding box gps latitude longitude search. By defining an upload date will not provide the user the ability to show images "taken" in a specific period and can at most me used to provide "newer" images from location.

The search used here is organized by upload date and a defined small gps bounding box that will show pictures from a relatively small area from the gps coordinates in the image. The returned call is a JSON object, where the image URL and the Panoramio image URL can be extracted from.

5.2.5 Flickr

Flickr has a huge list of API methods that developers can use. In this case I have used their API methods `flickr.photos.search`, `flickr.photos.getInfo` and `flickr.places.findByLatLon` for finding related images within a radius of 200 meters of the original image and location name from gps coordinates. These images are displayed to the user together with the ability to define a date interval for when the images are taken and show these pictures instead. By giving the user the ability to range the images, the user is able to find or lookup special "happenings" occurring at this spot for a given time interval. In example a user is taking photos in Paris France at the Champs-Élysées, and would like to see what the place looks like when the Tour De France finishing stage is held along this avenue. The user could then find out when the final stage in the last or previous Tour De France was and use these dates in the search. If any Flickr users have taken pictures at this date and geo tagged the images, they will show up if they were taken within the radius of the search.

To find the location name the Rubygem flickraw is used. This gem makes it possible to easily use the flickr API without coding your own methods for extracting data. By providing the function `flickr.places.findByLatLon` a gps coordinate set it will return a list sorted by "World level, Country, Region, City, and Street".

5.2.6 Weather Underground

As there are no weather web services that provides historical weather data this is grabbed from the Weather Underground[24] web site.

Very many places have identically names with other places in the world. To have a system gather temperature information automatically, the only way to make places some sort of unique is to link them with the nearest airport. This is because each airport has an unique ICAO-code associated with it determined by the International Civil Aviation Organization, hereby the name. The good thing about this is that, given an airport code the weather data from exactly this airport can be looked up. Also periodically weather forecasts at airports is a must for their daily conduct.

All the worlds airport codes together with the gps latitude and longitude are available in a list[25] created by Greg Thompson, this was last updated 6. October 2009 and this is the one that is used here. The list is parsed and put into the MySQL database for lookup availability. When the `WeatherHandler` is called on an image with gps coordinates it will first do a bounding box search with the latitude and longitude to find the nearest airport. Then it will parse the Weather Underground web page (see figure 5.4) for this airport at the image taken date and hour and grab the hourly temperature changes with the help of the Ruby library `mechanize` which

is used for automating interaction with web sites. Then the nearest hourly temperature measure is grabbed and stored in the database for the image.

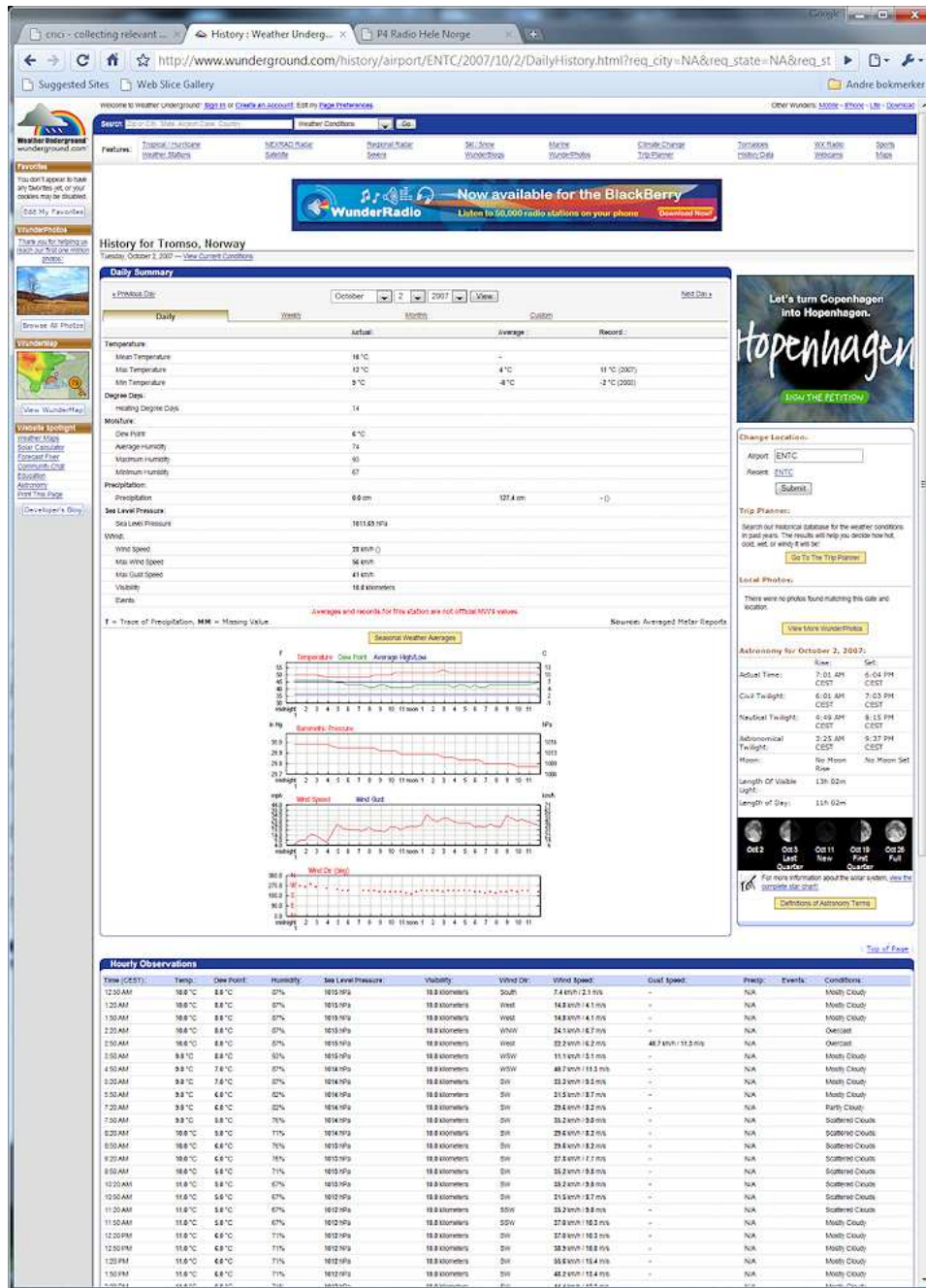


Figure 5.4: Weather underground historical forecast on an airport.

5.2.7 Image Categorization Context Retrieval

The search for corresponding context for an image categorization is done by doing a searches through a number of search providers. This includes google, bing, yahoo and Wikipedia where each one have their own customized HTML search result page parser. The system will for each picture fetch the *image category*, *location name* and *date-time* variables from the image database and use these as arguments of the search in each engine. The result list is split into title, summary and URL and each inserted into to the database. The parser will for each search only save the first page of search results from each source.

After a result has been located the function *value of category in url* is used to parse the URL to count the number of occurrences that the *image category* has, the same is done for the location name. These values are stored back to the database together with the title, summary and URL.

5.3 Web application

Figure 5.5, 5.6, 5.7, and 5.8 shows the web site showing related context information for an image. The numbered marks in the figure displays different gathered context and they display the following:

1. **Detailed image information.**
This information includes; image id, image category, filename, date/-time of image capture, location name, country, gps coordinates, approximate capture time temperature and top 5 panoramio image tags for the given area.
2. **Panoramio location related images from nearby area.**
Shows a list of 20 images that is collected from Panoramio that relates to the same geographical area as the image.
3. **Search field**
Search field to make the user able to search for images and image related context.
4. **Google Maps**
Shows a Google map of image capture location.
5. **Panoramio Map nearby images collection.**
Shows a Google map of Panoramio images from the related area with location related images.
6. **Flickr location related images from nearby area.**
This section will display 20 images that are collected from Flickr that

relates to the same geographical area as the image. The possibility to filter out what dates the images are taken at is also available.

7. Wikipedia related articles

Shows a list of Wikipedia articles generated from Geonames with a summary text that relates to the image gps coordinates. Each article has a *distance from* variable that describes the distance in kilometers from the image gps coordinate, to where the article has been located on the map. Each Wikipedia article also have a set of stars behind its header, marking the relevancy according to the image category. The rating goes from zero to ten stars, meaning that the article is supposedly relevant to the image.

8. Image Categorizational context

This list displays *image categorization* related context that is retrieved through searches in Google, Bing, Yahoo and Wikipedia free text search. These are also rated by image category like the Wikipedia articles in 7.



Figure 5.5: Top of image selection view with image data, search field, and Panoramio location related images.



Figure 5.6: Google maps and Panoramio location related pictures map.

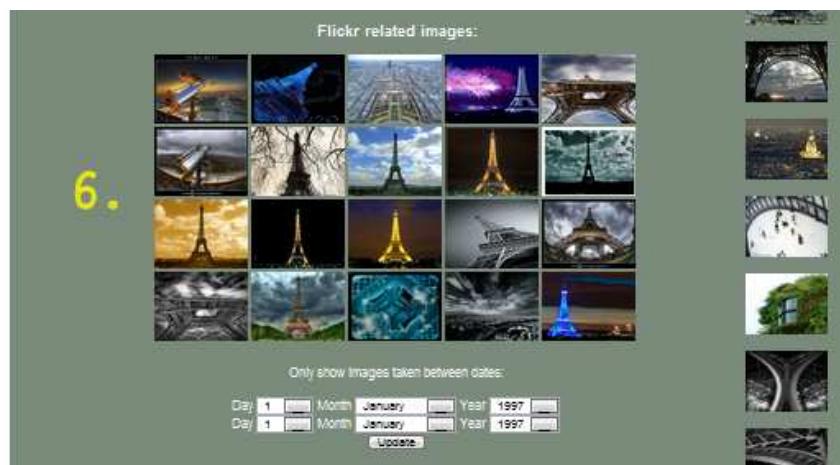


Figure 5.7: Flickr location related images with date specific search.

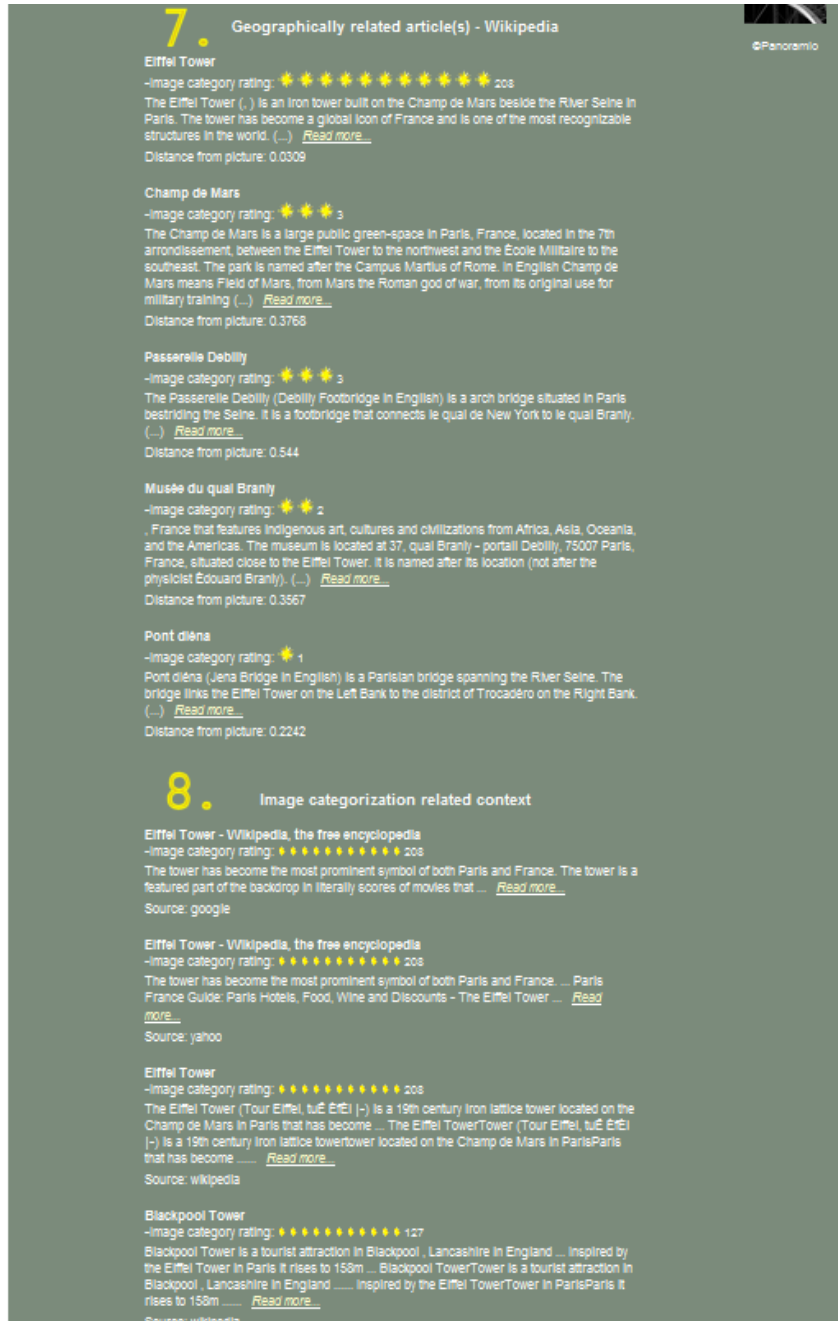


Figure 5.8: Wikipedia location related articles and search results from the other sources.

Chapter 6

Testing

In this chapter I will evaluate the system using a range of images to see if the collected context information has any connected relevancy. Ending the chapter with remarks of possible future work.

6.1 Test images

The images used in the test are listed in table 6.1. The test set is a combination of images. The images are popular attractions from world wide, football matches, concerts and some other events and places.

6.2 Results

The results for this evaluation is located in Appendix C.2 on page 135, but is best viewed online at <http://plaza.dyndns.info/cric/> where all images and collected data is located.

6.2.1 Location name selection

The first thing that attracts interest in the image categorization context search, is the automatic selection of a location name. Both Geonames and Flickr have reverse geographical coding web services where they provide tools for finding a place name for a given gps coordinate. The interesting point in this information is how detailed the location name should be. The Flickr API is used for finding the location names from gps coordinates. As stated in the Flickr section in chapter 3 the detail value between 1 and 16 can be applied, but tuning the location name detail to a level of 9 shows reasonable location name results. This is because choosing a wide span place or a less detailed name will e.g. for image nr. 3(Ishavekatedralen, Tromsø, Norway) give the location name "Troms Fylke", and not "Tromsø" or "Tromsdalen" as this is more correct. The same concurs when using a to narrow span,

Id	Object	Country	City	Image category
1	Notre Dame, church	France	Paris	Church
2	Nidarosdomen, church	Norway	Trondheim	Church
3	Ishavskatedralen, church	Norway	Tromsø	Church
4	Ulm Minster, church	Germany	Ulm	Church
5	Westminster Abbey, church	United Kingdom	London	Church
6	Golden Gate Bridge	U.S.A.	San Francisco	Bridge
7	Washington Monument	U.S.A.	Washington D.C.	Monument
8	Colosseum	Italy	Rome	Architecture
9	Leaning tower of Pisa	Italy	Pisa	Tower
10	Eiffel tower	France	Paris	Tower
11	Burj Al-Arab, hotel	United Arab Emirates	Dubai	Hotel
12	Ice hotel	Sweden	Jukkasjärvi	Architecture
13	Cheops Pyramid	Egypt	Giza Necropolis	Pyramid
14	Brandenburger Tor	Germany	Berlin	Gate
15	Bagration bridge	Russia	Moscow	Bridge
16	North Shore, beach	Oahu	Hawaii	Surfing
17	ASP World Tour, surfing (20.05.2009)	Teahupoo	Tahiti	Surfing
18	Star Beach	Greece	Hersonissos	Beach
19	Polar Zoo	Norway	Bardu	Zoo
20	Ayers Rock	Australia	Uluru	Mountain
21	Manchester United vs. Sunderland, Premier League (6.12.08)	United Kingdom	Manchester	Football
22	Manchester United vs. Aalborg, Champions League (10.12.08)	United Kingdom	Manchester	Football
23	Tromsø IL vs. Vålerenga, Tippeligaen (6.4.08)	Norway	Tromsø	Fotball
24	FC København vs. FC Nordsjælland, Danish Superliga (9.5.09)	Denmark	Copenhagen	Football
25	Vålerenga vs. Liverpool, Training Match (5.8.08)	Norway	Oslo	Fotball
26	Døgnvill festival (29.8.2008)	Norway	Tromsø	Konsert
27	U2 concert (27.07.2005)	Norway	Oslo, Valle	Konsert
28	Muse concert (24.10.2009)	Sweden	Stockholm	Concert
29	U2 concert (30.06.2009)	Spain	Barcelona	Concert
30	Bruce Springsteen and The E Street Band concert (16.04.2009)	U.S.A.	Los Angeles	Concert

Table 6.1: Table over the test images.

example using image nr. 21(Manchester United vs. Sunderland, Premier League (6.12.08)) will produce "Gorse Hill", and not "Manchester" as this is a more suited name. A complete list of all name ranges for the locations in the images can be seen in Appendix C.1 on page 126. The level of detail can be defined, testing out different values shows that cities and locations from place to place have different levels of what is defined as a city and what is a area or a community name. The same problem will span over the other images as well and using a "wrong", "too accurate" or "to wide" location

name in the search makes the search results less accurate and the amount of related information fell.

6.2.2 Weather data

The weather data search shows itself approximately accurate by manually confirming weather data from airports from the weatherunderground web site. As the temperature is gathered from the nearest airport is must be seen at as an approximate value for the location.

6.2.3 Flickr & Panoramio

Both Flickr and Panoramio displays location related images from a given gps radius or offset from a a given place, and this function works great if the user is interested in seeing images that others have taken within the same location. But if the gps coordinate is somewhat "off" the originated place, this makes wrong or none related images to show in the list. An example of this can be seen in image nr. 19(Polar Zoo), where no images is displayed from Flickr and only two images from Panoramio. This picture has its gps coordinate somewhat off where it should be and could correspond to this glitch in related images.

The ability to view images taken between a specific date also works good, as long as there are images that matches the date selection. It displays good accuracy for viewing images taken within a date specter and can especially be seen with image nr. 30(U2 concert, Barcelona). Initially the images that are showed are from "Camp Nou" which is the stadium of the football club Barcelona FC, but selecting the date to correspond with the image, a selection of images taken at the concert is viewed. See an example of this in figure 6.1 where no date is specified, opposed to figure 6.2 where the image date is specified.

6.2.4 Wikipedia through Geonames

Using the geographical related Wikipedia search through the Geonames API provides good articles of interest related to the surrounding location where an image is taken at. This source of context related information must be seen as extremely valuable, and works as a good information source regarding nearby interesting objects and places. And when the system rates these articles by the ratio of the image category, each article can be valued by the range of relevancy or interest.

Having these articles valued by the image category makes them ratable in the system, but this does not mean that it is superb in all location areas and situations. It also shows that locations of "non-interesting" points such as picture number 18, 19, and 27 does not display any related articles from Wikipedia.



Figure 6.1: Images from Flickr with no date specification.

6.2.5 Level of relevancy in searches

The search results for context information throughout the search engines google, bing, yahoo and wikipedia varies from good to bad. This shows itself especially for information about places and buildings to events such as soccer matches and concerts.

The images of buildings and places have reasonable good matches in the search. Some of the searches in images provides the same articles as Wikipedia through Geonames and other relevant web articles, and the rating system for valuing the matches seems to work in the degree that more valuable articles are placed on top of the list. Even though there are articles that does not explicitly have any relation to the image object that also gets high categorization and location value rating. A more powerful way of determining the value of interest an article would be preferable and could maybe help filter out meaningless articles.

The level of detail in the location name selection also influences the search results in a great degree. As mentioned above the selection ranges from 1 to 16 in detail, and choosing values that are out of range, either using an area

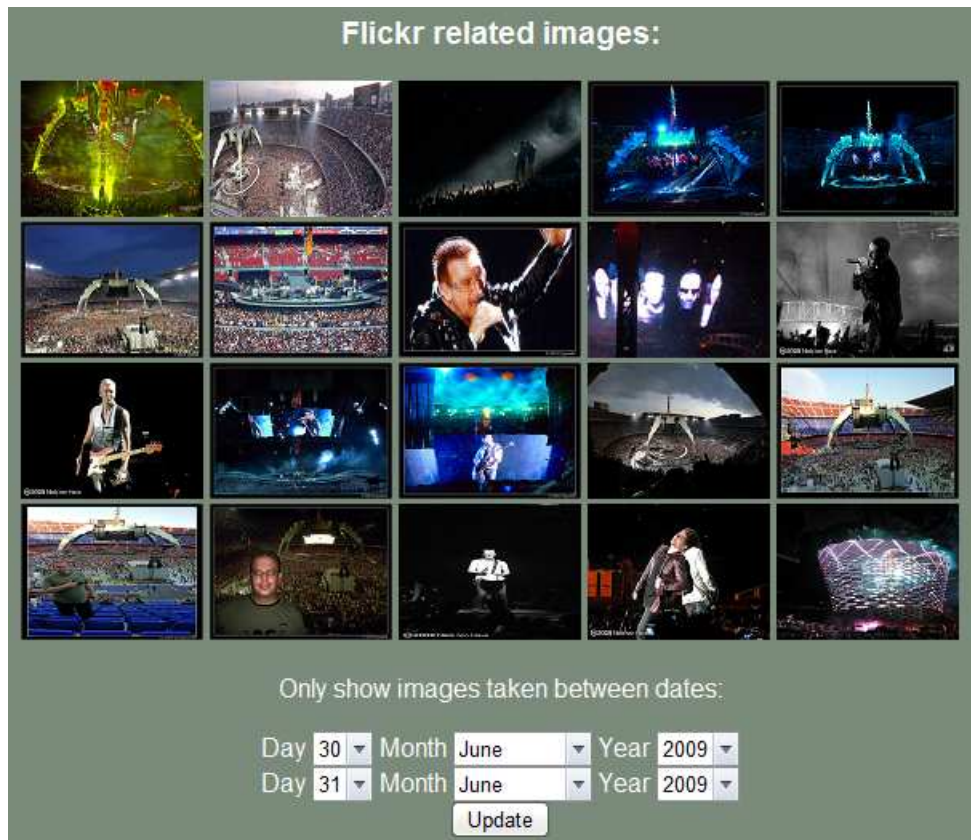


Figure 6.2: Images from Flickr with date specification.

name or street name made the results worse.

Another remark is the natural language of the information. An example of this can be explained with image nr. 23 (Tromsø IL vs. Vålerenga, Tippeligaen) where the image is from the norwegian soccer match between Tromsø and Vålerenga. Using the english category name "football" and the norwegian name "fotball" made differences in the results. While the english name provided some international score results web pages from the game, the norwegian name provided more match related hits and information about the whole soccer round that was played on this date. The same problem can be related to image nr. 29 (Døgnvill festival (29.8.2008)) where the norwegian and english names for concert provided different results.

So overall for the images including either concert events and football events, the system did not manage to collect that much event specific data. The exception is image number 29 (U2 concert (30.06.2009), Barcelona), where a lot of the retrieved data was relevant for the specific event. This is possibly because of the extreme interest there is in U2 as a band, and small events needs a more specific search for finding information about it

than an image category can provide. This can be seen in contrast to image number 30.(Bruce Springsteen and The E Street Band concert (16.04.2009), Los Angeles) where only one search result matched the event itself, and this article provided the set-list the band played at this concert.

6.3 Future work

The system works in the degree that is described in this thesis, but could be further developed so that there is more interaction with the user and provide more usability in a way that the user can add and edit information that is provided for an image. As of now the system is merely a "give and tell" type of system, meaning that it does not allow the user to change information that is added to the system.

Also a better way of evaluating articles from searches is preferable, to decrease the amount of non-related information and increase the relevancy of the results.

The list under provides some of my ideas of what could be done to develop the system further.

1. **Upload system**

The way the system imports images now is not very user friendly, and made for this thesis only. There should be a way for the user to select images or folders from their computer and upload to the system. This could be done with e.g. Javascript or Macromedia Flash. This makes the system able to run at a remote location/service and have multiple users.

2. **Image administration**

The user should have the opportunity to view the images in a file-like structure and have the ability to delete images.

3. **Meta data editing**

The user should be able to:

- geo tag an image that is not geo-tagged on import.
- apply an image categorization to an image that does not have image category on import.
- add a description to an image.

4. **Re-search of context information** The possibility for the user to use the post in-putted tags and description to do a new search for related context information.

5. **Remove unwanted image categorization context search results**

The possibility for the user to remove unwanted results in the image categorization results.

6. **Back to exif saving**

The possibility to have context information that is retrieved from the system or added manually saved back to the image exif.

Chapter 7

Conclusion

In this thesis I have presented a system where a user can upload images with an image category through a web page, and then it automatically gathers context information that an image and its setting can relate to. The system utilizes many sources that spans from location name data, weather data, location specific articles, to finding specific images that relates both locational, and date/timewise. All the sources that are used, are available for public use. With a starting point of only image captured meta-data, the system uses this information separately and in combinations with retrieved context to further span the search for more context. In the end the user can view his or hers images through a web page displaying the retrieved context containing location data, location specific articles, related images, map, and articles retrieved through various searches. The articles are also rated for location and image category, providing the user with a visual feedback on how interesting the article could be.

As the evaluation of the system shows, the amount of related information that is retrieved varies a lot from what setting or situation an image is taken at. Images of known buildings and places together with a somewhat "correct" image category provided a good source for finding related information about it. However finding event specific related information was not as successful as thought, even though there were some images that provided some good results. This also brought the problem of what natural language the search should be done in, testing showed that some events had more related searches using the natural language of the location rather than English. This could probably be improved by having the ability for the user to add tags or keywords post of image processing, as mentioned in the future work. As this thesis is about using image categorization data together with image meta-data, adding data to the system goes outside the ground rules of the thesis, but should be implemented if the system is improved.

Overall this thesis shows that the ability to automatically retrieve related context information for an image is quite possible using available information

sources and a user provided image category, even though it is not as effective in all situations.

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Appendix A

Context information collector

A.1 crici.rb

Listing A.1: crici.rb

```
1 #!/usr/bin/env ruby
2
3 # Add project classes
4 require 'DirHandler'
5 require 'ContextHandler'
6 require 'DatabaseHandler'
7 require 'ExifHandler'
8 require 'constants'
9 require 'GeonamesHandler'
10 require 'WeatherHandler'
11 require 'CategorizationHandler'
12 require 'timeout'
13
14 # Program constants
15 # Show or not show debug messages
16 DEBUG = 1
17
18 ##
19     #####
20
21 app = ContextHandler.new
22 app.run
23
24 ##
25     #####
```

A.2 constants.rb

Listing A.2: constants.rb

```
1 #!/usr/bin/env ruby
2
3 SELF_DIR = Dir.getwd
```

```
4 IMAGES_DIR = "C:/Program Files (x86)/Apache Software Foundation/Apache2
  .2/htdocs/cric/images/store"
```

A.3 categorizationhandler.rb

Listing A.3: CategorizationHandler.rb

```
1 #!/usr/bin/env ruby
2 require 'DatabaseHandler'
3 require "hpricot"
4 require "open-uri"
5 require 'htmlentities'
6 require 'json'
7 require 'net/http'
8 require 'iconv'
9 require 'cgi'
10
11 # class for finding related image category context
12 class CategorizationHandler
13   def initialize()
14     # database handler
15     @dbh = DatabaseHandler.new
16     @id = nil
17   end
18
19   # do categorization context search on all sources
20   def process_search(filename)
21     # get ID from filename
22     q = "Select id from image where filename = '#{filename}'"
23
24     @dbh.connect
25
26     r = @dbh.query(q)
27     row = r.fetch_hash
28     id = row["id"]
29
30     begin
31       Timeout::timeout(240) do
32         debug(" Google searching... #{Time.now}")
33         # search google and insert into DB
34         list = self.search_google(id)
35         if list
36           self.insert_db(list, "google", id)
37         end
38       end
39     rescue Timeout::Error
40       debug(" Timeout error")
41     end
42
43     begin
44       Timeout::timeout(240) do
45         debug(" Yahoo searching... #{Time.now}")
46         # search yahoo and insert into DB
47         list = self.search_yahoo(id)
48         if list
49           self.insert_db(list, "yahoo", id)
50         end
51       end
52     rescue Timeout::Error
53       debug(" Timeout error")
54     end
```

```

55
56 begin
57   Timeout::timeout(240) do
58     debug(" Bing searching... #{Time.now}")
59     # search bing and insert into DB
60     list = self.search_bing(id)
61     if list
62       self.insert_db(list, "bing", id)
63     end
64   end
65 rescue Timeout::Error
66   debug(" Timeout error")
67 end
68
69 begin
70   Timeout::timeout(240) do
71
72     debug(" Wikipedia searching... #{Time.now}")
73     # search wikipedia and insert into DB
74     list = self.search_wiki(id)
75     if list
76       self.insert_db(list, "wikipedia", id)
77     end
78   end
79 rescue Timeout::Error
80   debug(" Timeout error")
81 end
82 @dbh.close
83
84 end
85
86 # inputs result list into related table in database
87 def insert_db(list, source, id)
88   @dbh.connect
89
90   if list == -1:
91     return 0
92   end
93
94   # parse list of search results
95   list.each do |item|
96
97     title = item[:title]
98     url = item[:url]
99     summary = item[:summary]
100    cat_value = item[:cat_value]
101    loc_value = item[:loc_value]
102
103    url = url.lstrip
104    url = url.rstrip
105
106    title = @dbh.escape_string(title.to_s)
107    summary = @dbh.escape_string(summary.to_s)
108    url = @dbh.escape_string(url)
109
110    # create query
111    q = "INSERT INTO related (picid, title, summary, url, source,
112      cat_value, loc_value) VALUES
113      ('#{id}', '#{title}', '#{summary}', '#{url}', '#{source}',
114      '#{cat_value}', '#{loc_value}')"
115
116    #puts q

```

```
115
116     # insert into DB
117     @dbh.query(q)
118
119     end
120
121     @dbh.close
122 end
123
124
125 # function to find image category, date and place name of an image id
126 # @returns image category, date_time and location
127 def get_search_data(id)
128
129     coder = HTMLEntities.new
130
131     # connect to db
132     @dbh.connect
133
134     q = "Select category, location_name, date_time, country from image
135         where id = '#{id.to_s}'"
136
137     res = @dbh.query(q)
138     row = res.fetch_hash
139
140     cat = row["category"]
141     date_time = row["date_time"]
142     location = row["location_name"]
143     country = row["country"]
144
145     # check for context return nil if no context image
146     if cat == "" || cat == nil
147         return nil
148     elsif location == "" || location == nil
149         return nil
150     else
151         # remove trailing spaces
152         cat = cat.lstrip
153         cat = cat.rstrip
154         location = location.lstrip
155         location = location.rstrip
156         date_time = date_time.lstrip
157         date_time = date_time.rstrip
158
159         country = CGI.escape(country)
160
161         location = Iconv.conv('utf-8', 'utf-8', location)
162
163         location = CGI.escape(Iconv.new('utf-8', 'UTF-8').iconv(CGI.
164             unescape(location)))
165
166         # escape
167         #location = escape_string(location)
168
169         cat = CGI.escape(cat)
170         loc = CGI.escape(location)
171
172         date_time = date_time.split(' ')[0]
173
174         #location = coder.encode(location)
175
```

```

175     # date specific events
176     if cat.include?("Football") || cat.include?("Fotball") || cat.
177         include?("Concert") || cat.include?("konsert")
178         nil
179     else
180         date_time = country
181     end
182     return location, cat, date_time
183 end
184
185 end
186
187 # get geo data for image
188 def get_geo_data(id)
189     @dbh.connect
190
191     q = "select gps_latitude, gps_longitude from image where id='#{id}'
192         "
193
194     res = @dbh.query(q)
195
196     row = res.fetch_row
197
198     lat = row[0]
199     lon = row[1]
200
201     return lat, lon
202 end
203
204 # function to get search results from google
205 # returns array with searches in each hash with :title, :url, summary
206 :
207 def search_google(id)
208     # get search terms
209     location, image_category, date = get_search_data(id)
210
211     if location == nil || image_category == nil
212         return nil
213     end
214
215     # results array, returned
216     results = Array.new
217
218     debug "    http://www.google.com/search?q=#{location}+#{
219         image_category}+#{date}"
220
221     begin
222         page = Hpricot( open( "http://www.google.com/search?q=#{location}
223             }+#{image_category}+#{date}" ) )
224     rescue EOFError || SSLerror || Errno::ETIMEDOUT || ECONNRESET
225         return -1
226     end
227     #page = Hpricot( open( "http://www.google.com/search?q=#{location}
228         }+#{image_category}+#{date}" ) )
229
230     url_pre = "http://"
231
232     page2 = (page/'/*[@id="res"]')
233     resultlist = (page2/'div[1]/ol/li')

```

```

231
232     # parse through search results and add to array
233     resultlist.each do |elem|
234         begin
235             title = (elem/'/h3/a').inner_text
236             summ = (elem/'//div[@class="s"]')
237             url = (elem/'/h3/a').first.attributes["href"]
238             #url = elem.search("//a").first.attributes["href"]
239             #url = url[7, (url.length - 2)]
240
241
242             summ.search("/cite").remove
243             summ.search("/div").remove
244             summ.search("/span").remove
245             summary = summ.inner_text
246
247             if url == nil
248                 next
249             end
250
251             a = Hash.new
252
253             a[:title] = title
254             a[:url] = url
255             a[:summary] = summary
256             a[:cat_value] = self.value_of_category_in_url(url,
257                 image_category)
258             a[:loc_value] = self.value_of_category_in_url(url, location)
259
260             results.push(a)
261         rescue
262             next
263         end
264     end
265     return results
266 end
267
268 # functin to get search results from bing
269 # returns array with searches in each hash with :title, :url, summery
270 :
271 def search_bing(id)
272     # get search terms
273     location, image_category, date = get_search_data(id)
274
275     if location == nil || image_category == nil
276         return nil
277     end
278
279
280
281     debug "      http://www.bing.com/search?q=#{location}+#{
282         image_category}+#{date}+&go=&form=QLH&filt=all"
283
284     begin
285         page = Hpricot( open( "http://www.bing.com/search?q=#{location
286             }+#{image_category}+#{date}+&go=&form=QLH&filt=all" ) )
287     rescue EOFError || SSLError || Errno::ECONNRESET || Errno::
288         ETIMEDOUT
289         return -1
290     #page = Hpricot( open( "http://www.bing.com/search?q=#{location

```

```

        )+#{image_category}+#{date}&go=&form=QBLH&filt=all" ) )
288   end
289
290   results = Array.new
291
292   tmp = page.search('//*[@id="wg0"]')
293
294   # parse through search results and add to array
295   (tmp/"li").each do |elem|
296     title = (elem/"div[1]/h3").inner_text
297
298     summary = (elem/"p").inner_text
299
300     url = (elem/"div[1]/h3/a").first.attributes["href"]
301
302     a = Hash.new
303     summary = Iconv.conv('latin1//IGNORE', 'utf-8', summary)
304     a[:title] = title
305     a[:url] = url
306     a[:summary] = summary
307     a[:cat_value] = self.value_of_category_in_url(url, image_category
308     )
309     a[:loc_value] = self.value_of_category_in_url(url, location)
310     results.push(a)
311   end
312   # return result array
313   return results
314
315 end
316
317 # function to get search results from yahoo
318 # returns array with searches in each hash with :title, :url, summary
319 :
320 def search_yahoo(id)
321   # get search terms
322   location, image_category, date = get_search_data(id)
323
324   if location == nil || image_category == nil
325     return nil
326   end
327
328   url_pre = "http://"
329
330   debug "      http://no.search.yahoo.com/search?p=#{location}+#{
331     image_category}+#{date}&fr=yfp-t-501&ei=UTF-8&meta=vc%3D"
332   begin
333     docy = Hpricot( open( "http://no.search.yahoo.com/search?p=#{
334       location}+#{image_category}+#{date}&fr=yfp-t-501&ei=UTF-8&
335       meta=vc%3D" ) )
336   rescue EOFError || SSLError || Errno::ECONNRESET || Errno::
337     ETIMEDOUT
338     return -1
339   #docy = Hpricot( open( "http://no.search.yahoo.com/search?p=#{
340     location}+#{image_category}+#{date}&fr=yfp-t-501&ei=UTF-8&
341     meta=vc%3D" ) )
342   end
343
344   # results array
345   results = Array.new

```



```

341
342 # parse through search results and add to array
343 (docy/"html/body/div/div[2]/div/div[2]/div/div/ol/li").each do |
    result|
344     res = (result/"div[@'res'"]
345
346     title = (res/"h3").inner_text
347     url = (res/"h3/a").first.attributes["href"]
348     summary = (res/"div[@'abstr'"]).inner_text
349     summary = summary.sub(title, '')
350
351     a = Hash.new
352     a[:title] = title
353     a[:url] = url
354     a[:summary] = summary
355     a[:cat_value] = self.value_of_category_in_url(url, image_category
    )
356     a[:loc_value] = self.value_of_category_in_url(url, location)
357     results.push(a)
358
359 end
360 # return result array
361 return results
362
363 end
364
365 # function to get search results from wikipedia
366 def search_wiki(id)
367     # get search terms
368     location, image_category, date = get_search_data(id)
369
370     if location == nil || image_category == nil
371         return nil
372     end
373
374     debug "    http://en.wikipedia.org/wiki/Special:redirs=0&Search?
        search=#{image_category}+#{location}&go=Go"
375
376     begin
377         page = Hpricot( open( "http://en.wikipedia.org/wiki/Special:
            redirs=0&Search?search=#{image_category}+#{location}&go=Go" )
        )
378     rescue EOFError || ETIMEDOUT || SSLError || Errno::ECONNRESET ||
        Errno::ETIMEDOUT
379         sleep(3)
380         return
381         #page = Hpricot( open( "http://en.wikipedia.org/wiki/Special:
            redirs=0&Search?search=#{image_category}+#{location}&go=Go" )
        )
382     end
383
384     result_list = page.search('/html/body/div/div/div/div[2]/div[3]')
385
386     list = result_list.search("ul[@class='mw-search-results'"]
387
388     url_pre = "http://en.wikipedia.org"
389
390     # results array
391     results = Array.new
392
393     (list/'/li').each do |elem|
394         a_tmp = elem.search("/a")

```

```

395     ahref_tmp = a_tmp.attr('href')
396
397     a = a_tmp.inner_text
398     summ_tmp = elem.search("/div[1]'"")
399     summ = summ_tmp.inner_text
400
401     title = a
402     url = url_pre + ahref_tmp
403     summary = summ_tmp
404
405     a = Hash.new
406     a[:title] = title
407     a[:url] = url
408     a[:summary] = summ
409     a[:cat_value] = self.value_of_category_in_url(url, image_category
410     )
411     a[:loc_value] = self.value_of_category_in_url(url, location)
412     results.push(a)
413 end
414 # return result array
415 return results
416 end
417
418 # process panoramio tags
419 def flickr_tags(filename)
420   @dbh.connect
421
422   q = "Select id from image where filename = '#{filename}'"
423
424   r = @dbh.query(q)
425   row = r.fetch_hash
426   id = row["id"]
427   self.get_tags_flickr(id)
428
429   @dbh.close
430 end
431
432 # process panoramio tags
433 def panoramio_tags(filename)
434   @dbh.connect
435
436   q = "Select id from image where filename = '#{filename}'"
437
438   #debug(filename)
439   #debug(q)
440
441   r = @dbh.query(q)
442   row = r.fetch_hash
443   id = row["id"]
444   #debug(id)
445   self.get_tags_panoramio(id)
446
447   @dbh.close
448 end
449
450 # get panoramio tags from panoramio_photo_url
451 # @returns list of panoramio tags
452 def get_panoramio_url_tags(pano_url)
453
454   begin
455     page = Hpricot( open( pano_url ) )

```

```
456 rescue OpenURI::HTTPError
457   return -1
458 end
459
460 coder = HTMLEntities.new
461
462 a = Array.new
463
464 (page/"html/body/div/div[2]/div[2]/div[2]/ul/li").each do |tmp|
465   tag = (tmp/:a)
466   tag_name = tag.inner_html.lstrip
467   tag_name = tag_name.rstrip
468   tag_name.gsub!(/\W+/, '')
469
470   tag_name = Iconv.conv('latin1//IGNORE', 'utf-8', tag_name)
471
472   a.push(tag_name.downcase)
473 end
474
475 return a
476 end
477
478 def get_tags_flickr(id)
479   lat, lon = self.get_geo_data(id)
480
481   if lat == nil
482     return nil
483   end
484
485   key = "e496cb4c3a379b2de0aae18f5528eb22"
486   secret = "0aef1c50d532f48c"
487
488   offset = 0.00005
489
490
491   minlat = lat.to_f - offset
492   maxlat = lat.to_f + offset
493   minlon = lon.to_f - offset
494   maxlon = lon.to_f + offset
495   min_taken_date = "2000-12-31 00:00:00";
496   max_taken_date = "2009-12-31 23:59:59";
497   radius = 0.5
498
499   hbox = minlon.to_s + "," + minlat.to_s + "," + maxlon.to_s + "," +
500         maxlat.to_s
501
502   call = flickr.photos.search :api_key => key, :secret => secret, :
503         min_taken_date => min_taken_date, :max_taken_date =>
504         max_taken_date, :lat => lat, :lon => lon, :radius => radius
505
506   #photo ids array
507   images = Array.new
508   secrets = Array.new
509
510   maxpictures = 50
511   i = 0
512   call.length.times do |elem|
513     images.push(call[elem].id)
514     secrets.push(call[elem].secret)
515     i += 1
516     if i == maxpictures
517       break
518     end
519   end
520 end
```

```

515     end
516   end
517
518   #iterate through ids and get tags
519   h = Hash.new
520
521   images.length.times do |elem|
522     call = flickr.photos.getInfo :api_key => key, :photo_id => images
523       [elem], :secret => secrets[elem]
524
525     call.tags.each do |tag|
526       tag = tag.to_s.downcase
527       if h.has_key?(tag)
528         h[tag] = h[tag] + 1
529       else
530         h[tag] = 1
531       end
532     end
533     #break
534   end
535
536   res = Array.new
537   maxtags = 5
538
539   i = 0
540   h.sort{|a,b| b[1]<=>a[1]}.each { |elem|
541     #puts "#{elem[0]} - #{elem[1]}"
542
543     res.push(elem[0])
544
545     if i == maxtags
546       break
547     else
548       i = i + 1
549     end
550   }
551   # connect to db
552   @dbh.connect
553
554   # insert tags into db
555   res.each do |tag|
556     q = ("INSERT INTO tags (tag, picid, source) VALUES ('#{tag}', '#{
557       id}', 'flickr')")
558     @dbh.query(q)
559   end
560   @dbh.close
561 end
562
563 # get a list of panoramio tags from images from same location
564 def get_tags_panoramio(id)
565
566   # get geo coordinates for image
567   lat, lon = self.get_geo_data(id)
568
569   # no geo context
570   if lat == nil
571     return nil
572   end
573   # gps coordinates offset
574   lat = lat.to_f

```

```
575     lon = lon.to_f
576     offset = 0.0005
577     minx = (lon - offset)
578     miny = (lat - offset)
579     maxx = (lon + offset)
580     maxy = (lat + offset)
581
582     # number of images
583     nr = 30
584
585     # max number of tags
586     maxtags = 5
587
588     # panoramio url
589     uri = "http://www.panoramio.com/map/get_panoramas.php?order=
          upload_date&set=full&from=0&to=#{nr}&minx=#{minx}&miny=#{miny}&
          maxx=#{maxx}&maxy=#{maxy}&size=thumbnail"
590
591     begin
592       resp = Net::HTTP.get_response(URI.parse(uri))
593       # try again, timeout
594       rescue OpenURI::HTTPError
595         return -1
596       end
597
598     data = resp.body
599
600     # decode JSON data
601     object = JSON.parse(data);
602
603     # counter
604     i = 0
605
606     # tags hash
607     h = Hash.new
608
609     # collect image uris
610     object['photos'].each do |row|
611       url = row['photo_url']
612
613       # retrieve tags from uri
614       res = self.get_panoramio_url_tags(url)
615
616       if res == -1:
617         return -1
618       end
619
620       # add to result set
621       res.each do |tag|
622         if h.has_key?(tag)
623           h[tag] = h[tag] + 1
624         else
625           h[tag] = 1
626         end
627       end
628       i += 1
629     end
630
631     res = Array.new
632
633     i = 0
634     h.sort{|a,b| b[1]<=>a[1]}.each { |elem|
```

```

635     #puts "#{elem[0]}\n" - "#{elem[1]}"
636
637     res.push(elem[0])
638
639     if i == maxtags
640         break
641     else
642         i = i + 1
643     end
644 }
645
646 # connect to db
647 @dbh.connect
648
649 # insert tags into db
650 res.each do |tag|
651     q = ("INSERT INTO tags (tag, picid, source) VALUES ('#{tag}', '#{
652         id}', 'panoramio'")
653     @dbh.query(q)
654 end
655 @dbh.close
656
657 end
658
659 # function to retrieve synonyms for image category from WordNet
660 # @returns list of synonyms
661 def get_category_nouns(term)
662     # wordnet
663     page = Hpricot( open( "http://wordnetweb.princeton.edu/perl/webwn?s
664         =#{term}&sub=Search+WordNet&o2=&o0=&o7=&o5=&o1=&o6=&o4=&o3=&h
665         =000000000" ) )
666
667     syn = Array.new
668
669     # parse wordnet
670     (page/"//a[@class='pos']").each do |tmp|
671         if tmp.to_s.include?("n")
672             # add to synonym array unless already in
673             syn.push(tmp.next_node.inner_html) unless syn.include?(tmp.
674                 next_node.inner_html)
675         end
676     end
677     return syn
678 end
679
680 def value_of_category_in_url(url, term)
681     if url.include?("https")
682         return -1
683     end
684
685     image_category = term
686
687     #puts url
688     #puts term
689
690     #
691     #return 0
692

```

```
693     #sleep(1)
694     begin
695         page = Hpricot( open(url) )
696         content = (page//'/html/body').inner_text
697     rescue Timeout::Error
698         return -1
699     rescue OpenURI::HTTPError
700         return -1
701     rescue RuntimeError
702         return -1
703     rescue EOFError
704         return -1
705     #rescue SSLError::NameError
706     # return -1
707     rescue NameError
708         return -1
709     rescue Errno::ECONNRESET
710         return -1
711     rescue RuntimeError
712         return -1
713     rescue
714         return -1
715     end
716
717     h = Hash.new(0)
718
719     image_category.downcase!
720     content = content.to_s.downcase!
721
722     if content == nil
723         return -1
724     end
725
726     content.gsub!(/\W+/, ' ')
727
728     content.split.each do |w|
729         h[w] += 1
730     end
731
732     return h["#{image_category}"]
733 end
734
735 # count occurrences of location name in url-body
736 def value_of_location_in_url(url, term)
737
738     if url.include?("https")
739         return -1
740     end
741
742     begin
743         page = Hpricot( open(url) )
744         content = (page//'/html/body').inner_text
745     rescue Timeout::Error
746         return -1
747     rescue OpenURI::HTTPError
748         return -1
749     rescue RuntimeError
750         return -1
751     rescue EOFError
752         return -1
753     #rescue SSLError::NameError
754     # return -1
```

```
755     rescue NameError
756         return -1
757     rescue Errno::ECONNRESET
758         return -1
759     rescue RuntimeError
760         return -1
761     rescue
762         return -1
763     end
764
765     location_name = term
766
767     location_name.downcase!
768
769     content = content.to_s.downcase!
770
771     if content == nil || location_name == nil
772         return -1
773     end
774
775     content.gsub!(/\W+/, ' ')
776
777     location_length = location_name.length
778     content_length = content.length
779
780     tmp = location_name.split(' ', ' ')
781     location_name = tmp[0]
782     location_name.rstrip!
783     location_name.gsub!(/\W+/, ' ')
784
785     number_of_location = 0
786     offset = location_length
787     counter = 0
788
789     while (counter + offset) < content_length
790         if content[counter, (offset + counter)].include?(location_name)
791             number_of_location += 1
792         end
793
794         counter = counter + 1
795     end
796
797     return number_of_location
798
799 end
800
801 def debug(msg)
802     if (DEBUG)
803         puts "DEBUG: " + msg.to_s
804     end
805 end
806
807 def escape_string(string)
808     string.gsub!('/', "\\'")
809     string.gsub!('/', "'")
810     string.gsub!('/', "'")
811     string.gsub!(/\\/, "\\")
812     string.gsub!(/â/, "a")
813     string.gsub!(/ø/, "o")
814     string.gsub!(/æ/, "ae")
815     return string
816 end
```



```
817
818 end
```

A.4 contexthandler.rb

Listing A.4: ContextHandler.rb

```
1  #!/usr/bin/env ruby
2
3  # Add classes
4  require 'DirHandler'
5  require 'DatabaseHandler'
6  require 'ExifHandler'
7  require 'constants'
8  require 'GeonamesHandler'
9  require 'WeatherHandler'
10 require 'CategorizationHandler'
11 require 'timeout'
12
13
14 #
15 # A context handler class
16 #
17 class ContextHandler
18
19   def run()
20     debug("
21       -----
22       ")
23     debug("Started application - Listening for applied picture
24       directories...")
25     debug("
26       -----
27       ")
28
29     # database handler
30     db = DatabaseHandler.new
31     #connect handler
32     db.connect
33
34     # file and directory handler
35     dirh = DirHandler.new
36
37     # exif information handler
38     exifh = ExifHandler.new
39
40     # geonames data handler
41     geo = GeonamesHandler.new
42
43     # weather context handler
44     weah = WeatherHandler.new
45
46     # categorization handler
47     ch = CategorizationHandler.new
48
49     # statistics
50     total_files = 0
51
52     ##### START CYCLE
53     #####
54     while true
```

```

49
50   # fetch directory
51   path = db.get_path
52
53   if(path != "")
54     # check if directory
55     if (!dirh.new_dir(path))
56       debug(dirh.directory + " is not a directory")
57       # reset dir table in DB
58       db.path_processed
59       next
60     end
61
62     debug("STATUS: #{Time.now} directory found: #{path}")
63     debug("
64         -----
65         ")
66     # jpg files in directory
67     image_files = dirh.get_files
68
69     # copy to local storate
70     dirh.copy_images_to_storage
71
72     # cycle through folder and add images to DB
73     added_files = 0
74
75     image_files.each do |file|
76       # output info to console
77       debug("Processing file: " + file)
78
79       debug("EXIF process #{Time.now}")
80       exif_info = exifh.get_exif(file)
81
82       debug("Adding image to DB #{Time.now}")
83       res = db.add_image(exif_info)
84
85       #begin
86       debug("Geo information process #{Time.now}")
87       res = geo.process_image(file)
88
89       debug("Weather data process #{Time.now}")
90       res = weah.process_weather(file)
91
92       res = nil
93       begin
94         Timeout::timeout(60) do
95           debug("Panoramio tags process #{Time.now}")
96           res = ch.panoramio_tags(file)
97         end
98       rescue Timeout::Error
99         debug(" Timeout error")
100      end
101
102      res = nil
103      begin
104        Timeout::timeout(60) do
105          debug("Flickr tags process #{Time.now}")
106          res = ch.flickr_tags(file)
107        end
108      rescue Timeout::Error
109        debug(" Timeout error")

```

```

109         end
110
111         debug("Image categorizational process")
112         res = ch.process_search(file)
113
114         added_files += 1
115         total_files += 1
116         # output info to console
117         debug("Added #{file} to database and image storage")
118         debug("
119             -----
120             ")
121         #rescue
122         # db.query("delete from image where filename = '#{file}'")
123         # debug("ERROR: "+$!+", removed '#{file}' from database")
124         #end
125
126         end
127
128         debug("Status: #{Time.now} Added a total of #{added_files} to
129             the DB.")
130         debug("Status: #{Time.now} Total of #{total_files} in the DB.")
131         debug("
132             -----
133             ")
134
135         # reset dir table in DB
136         db.path_processed
137
138         # change CWD back to standard
139         Dir.chdir(SELF_DIR)
140
141         #debug(Dir.getwd)
142         end
143
144         # sleep for 10 seconds
145         sleep 10
146
147         end
148         ##### END CYCLE
149         #####
150
151         #close db handler
152         db.close
153
154         debug("end")
155
156     end
157
158     def debug(msg)
159         if (DEBUG)
160             puts "DEBUG: " + msg.to_s
161         end
162     end
163 end

```

A.5 databasehandler.rb

Listing A.5: DatabaseHandler.rb

```
1 #!/usr/bin/env ruby
2
3 # require mysql ruby-module
4 require "mysql"
5
6 #
7 # Database handler
8 #
9 class DatabaseHandler
10   def initialize()
11     @address = "localhost"
12     @username = "root"
13     @password = "*****"
14     @dbname = "test"
15     @dbh = nil
16   end
17
18   # initiate database connection
19   def connect
20     @dbh = Mysql.new(@address, @username, @password, @dbname)
21   end
22
23   # close database connection
24   def close
25     @dbh.close if @dbh
26   end
27
28   # query db
29   def query(q)
30     # number of retries
31     c = 4;
32
33     count = 0
34
35     begin
36       r = @dbh.query(q)
37
38     rescue
39       r = @dbh.query(q)
40
41     end
42
43     return r
44   end
45
46   # get directory path from DB
47   # @returns path as string
48   def get_path
49     result = self.query("SELECT dir from settings where id = 1 LIMIT 0,
50                          30 ")
51     r = result.fetch_row
52     r = r[0]
53
54     return r
55   end
56
57   # reset directory table
58   def path_processed
59     result = @dbh.query("UPDATE settings SET dir = \"\" WHERE id = 1")
60   end
61 end
```

```

60
61 # escape string
62 def escape_string(string)
63   return @dbh.escape_string(string)
64 end
65
66 # insert image information into database
67 def add_image(exif_info)
68   begin
69     # With GPS info
70     if (exif_info.length > 3)
71       q = ("INSERT INTO image (filename, date_time,
72         category, gps_latitude,
73         gps_longitude) VALUES (
74         '#{exif_info[0]}',
75         '#{exif_info[1]}',
76         '#{exif_info[2]}',
77         '#{exif_info[3]}',
78         '#{exif_info[5]}')")
79       result = @dbh.query(q)
80       #debug("--exif info > 3")
81
82     # without GPS info
83     else
84       q = ("INSERT INTO image (filename, date_time,
85         category ) VALUES (
86         '#{exif_info[0]}',
87         '#{exif_info[1]}',
88         '#{exif_info[2]}')")
89       result = @dbh.query(q)
90       #debug("--exif info = 3")
91     end
92
93   rescue
94     puts @dbh.error()
95
96   end
97
98   return result
99 end
100
101 end

```

A.6 databasehandler.rb

Listing A.6: DirHandler.rb

```

1 #!/usr/bin/env ruby
2
3 #Add several methods to the File class
4 require 'ftools'
5
6 def debug(msg)
7   if (DEBUG)
8     puts "DEBUG: " + msg.to_s
9   end
10
11 end
12
13 #
14 # Directory handler, check given folder and insert images into DB

```

```

15 #
16 class DirHandler
17
18   def initialize()
19     @directory = ""
20     @image_files = nil
21     @dbh = DatabaseHandler.new()
22     @dbh.connect
23   end
24   attr_accessor :directory, :image_files
25   attr_writer :directory, :image_files
26
27   # set new directory
28   # returns 1 if directory, 0 else
29   def new_dir(path)
30     @directory = path
31     if(File::directory?(path))
32       return true
33     else
34       return false
35     end
36   end
37
38   # get files from path
39   # @returns list of files
40   def get_files
41     img_files = Array.new
42
43     Dir.chdir(@directory)
44
45     # cycle through each image file
46     Dir.foreach(@directory) do |entry|
47
48       if entry.include?(".JPG")
49         if (!file_already_in_DB(entry))
50           img_files.push(entry)
51         end
52
53       elsif entry.include?(".jpg")
54         if (!file_already_in_DB(entry))
55           img_files.push(entry)
56         end
57
58       end
59
60       #debug("File " + entry)
61     end
62     @image_files = img_files
63
64     return img_files
65   end
66 end
67
68 # check if file is already ion DB
69 def file_already_in_DB(filename)
70   result = @dbh.query("SELECT id from image where filename = '#{
71     filename}'")
72   r = result.fetch_row
73
74   if (r == nil)
75     return false
76   else

```

```

76     return true
77   end
78
79 end
80
81 # copy files from given directory to local image storage
82 def copy_images_to_storage
83   @image_files.each do |file|
84     #debug("Copy from: " + @directory)
85     File.copy(@directory + "\\ "+ file, IMAGES_DIR)
86   end
87 end
88
89 end

```

A.7 dirhandler.rb

Listing A.7: ExifHandler.rb

```

1  #!/usr/bin/env ruby
2
3  # require EXIF reader
4  require "exifr"
5
6  #
7  # Exif information handler
8  #
9  class ExifHandler
10
11   # DEBUG function, show exif information
12   # @returns nothing unless no exif information is found
13   def showdata(image)
14     exifdata = Array.new
15
16     image_file = image
17
18     exif_info = EXIFR::JPEG.new(image_file)
19
20     if(!exif_info.exif?)
21       return 0
22     end
23
24     puts "Standard items".center(72)
25     puts "=" * 72
26     puts "                               File : #{image_file}"
27     puts "                               Height : #{exif_info.height}"
28     puts "                               Width : #{exif_info.width}"
29     puts
30
31     if exif_info.exif? then
32       puts "EXIF information".center(72)
33       puts "=" * 72
34       h = exif_info.exif.to_hash
35       h.each_pair do |k,v|
36         puts "#{k.to_s.rjust(30)} : #{v}"
37       end
38     else
39       puts "No EXIF information in this image"
40     end
41   end
42

```

```
43 # get exif information
44 # @returns array with
45 # filename, date_time, category,
46 # gps_latitude, gps_latitude_ref, gps_longitude, gps_longitude_ref
47 def get_exif(image)
48   # return array
49   exifdata = Array.new
50
51   image_file = image
52
53   # create exif info object
54   exif_info = EXIFR::JPEG.new(image_file)
55
56   # check if there is exif information
57   if(!exif_info.exif?)
58     return false
59   end
60
61   # convert exif data to hash
62   h = exif_info.exif.to_hash
63
64
65   # retrieve wanted information
66   filename = image.split("\\").last
67   date_time = h[:date_time_original]
68   date_time = self.format_date_in(date_time)
69   category = h[:image_description]
70
71   # add gps location information
72   if(h[:gps_latitude])
73     gps = true
74     gps_latitude = self.dms2dec(h[:gps_latitude][0], h[:gps_latitude
75       ][1], h[:gps_latitude][2], h[:gps_latitude_ref])
76
77     gps_latitude_ref = h[:gps_latitude_ref]
78
79     gps_longitude = self.dms2dec(h[:gps_longitude][0], h[:
80       gps_longitude][1], h[:gps_longitude][2], h[:gps_longitude_ref
81       ])
82
83     gps_longitude_ref = h[:gps_longitude_ref]
84   end
85
86   # add to returned object array
87   exifdata.push(filename)
88   exifdata.push(date_time)
89   exifdata.push(category)
90
91   # add gps data
92   if gps
93     exifdata.push(gps_latitude)
94     exifdata.push(gps_latitude_ref)
95     exifdata.push(gps_longitude)
96     exifdata.push(gps_longitude_ref)
97   end
98
99   return exifdata
100 end
101
102 # converts gps DMS to decimal value
103 #@returns decimal value
104 def dms2dec(deg, min, sec, ref)
```



```

102     # calculate total number of seconds
103     seconds = ((min * 60) + sec.to_f)
104     seconds = (seconds / 3600)
105     # add fractional degrees to whole degrees for final result
106     result = deg + seconds
107
108     # check if West of South degree, negate
109     if ref[0,1] == "W" || ref[0,1] == "S"
110         result = -result
111     end
112
113     return result
114 end
115
116 # converts gps decimal to DMS
117 def dec2dms(float)
118     # compute degrees, minutes and seconds
119     deg = long.to_i
120     minfloat = 60 * (float - deg)
121     min = minfloat.to_i
122     secfloat = 60 * (minfloat - min)
123
124     # seconds to desired precision
125     secfloat = "%.5f" % secfloat
126
127     # seconds might become 60
128     if secfloat >= 60
129         min = min + 1
130         secfloat = secfloat - 60
131     end
132
133     if min >= 60
134         deg = deg + 1
135         min = min - 60
136     end
137
138     return deg, min, secfloat
139 end
140
141 # function to format time and date from the form:
142 # Day Mnt #Day HH:MM:SS #timezone #year
143 def format_date_in(date)
144     r = 0
145
146     if date != nil
147         date = date.to_s
148         time_array = date.split(' ')
149
150         day = time_array[0]
151         month = time_array[1]
152         day = time_array[2]
153         time = time_array[3]
154         timezone = time_array[4]
155         year = time_array[5]
156
157         # month lookup
158         month_corr = {"Jan" => 1, "Feb" => 2, "Mar" => 3, "Apr" => 4,
159                     "May" => 5, "Jun" => 6, "Jul" => 7, "Aug" => 8,
160                     "Sep" => 9, "Oct" => 10, "Nov" => 11, "Dec" => 12}
161
162         month = month_corr["#{month}"]
163

```

```

164     r = "%2s.%02d.%4s %s " % [day, month, year, time]
165     end
166
167     return r
168
169 end
170
171 # function to read date and time string
172 # returns array with (day, month, year, time)
173 def format_date_out(date)
174
175     if date.nil?
176         return 0
177     end
178
179     tmp = date.split('.')
180
181     day = tmp[0]
182     month = tmp[1]
183
184     tmp2 = tmp[2].split(' ')
185     year = tmp2[0]
186     time = tmp2[1]
187
188     return day, month, year, time
189 end
190
191
192 end

```

A.8 geonameshandler.rb

Listing A.8: GeonamesHandler.rb

```

1  #!/usr/bin/env ruby
2  require 'geonames'
3  require 'DatabaseHandler'
4  require 'iconv'
5  require 'flickrapi'
6
7  # Geonames class for extracting location information from gps lat, long
   values
8  # uses the 'geonames' library for collecting data
9  class GeonamesHandler
10     def initialize()
11         @dbh = DatabaseHandler.new()
12     end
13
14     # adds geodata to DB for an image
15
16     def process_image(filename)
17         @dbh.connect()
18
19         q = "Select id from image where filename = '#{filename}'"
20
21         r = @dbh.query(q)
22         row = r.fetch_hash
23         id = row["id"]
24
25         q = "Select gps_latitude, gps_longitude from image where id = '#{id}'"

```

```

26
27     r = @dbh.query(q)
28     row = r.fetch_hash
29     lat = row["gps_latitude"]
30     lon = row["gps_longitude"]
31
32     geo_res = self.get_geo_information(lat, lon, id)
33
34     @dbh.close()
35
36     return geo_res
37
38 end
39
40
41 def get_geo_information(lat, long, id)
42
43     # no gps location available
44     if(!lat || !long)
45         return 0
46     end
47
48     # connect to db
49     @dbh.connect()
50
51     country_name = self.get_country(lat, long, id)
52     @dbh.query("Update image SET country = '#{country_name}' WHERE id =
53         '#{id}' ")
54
55     location_name = self.get_nearby_place(lat, long, id)
56     @dbh.query("Update image SET location_name = '#{location_name}'
57         WHERE id = '#{id}' ")
58
59     # updates DB inside function
60     r = self.get_nearby_wikipedia(lat, long, id)
61
62     # close db connection
63     @dbh.close()
64
65     return 1
66
67 end
68
69 # Get country for given given lat long gps coordinates
70 # @returns name of country
71 def get_country(lat, lon, id)
72     begin
73         r = Geonames::WebService.find_nearby_place_name(lat, lon)
74     rescue
75         r = Geonames::WebService.find_nearby_place_name(lat, lon)
76     end
77
78     return r[0].country_name
79 end
80
81 # Get nearby place name for given lat long gps coordinates
82 # @returns nearest place name
83 def get_nearby_place(lat_, lon_, id)
84     begin
85         i = 8

```

```

86     call = flickr.places.findByLatLon :lat => lat_, :lon => lon_ , :
      accuracy => i
87     location_name = call[0].name
88     #puts location_name
89     place_type = call[0].place_type
90     #puts place_type
91     #puts i
92     tmp = location_name.split(', ')
93     location_name = tmp[0]
94     location_name.rstrip!
95
96     location = CGI.unescape(location_name)
97 rescue
98
99     status = 0
100    for h in (0..5)
101        call = flickr.places.findByLatLon :lat => lat_, :lon => lon_ ,
          :accuracy => i
102        location_name = call[0].name
103        #puts location_name
104        place_type = call[0].place_type
105        tmp = location_name.split(', ')
106        location_name = tmp[0]
107        location_name.rstrip!
108
109        if call != nil
110            status = 1
111            break
112        end
113    end
114
115    if !status
116        raise "get_nearby_place" error'
117    end
118    location = CGI.unescape(location_name)
119 end
120
121 #return r[0].name
122 return Iconv.conv('LATIN1//IGNORE', 'utf-8', location)
123 end
124
125 # get wikipedia articles from area of lat long gps coordinates
126 def get_nearby_wikipedia(lat_, long_, id)
127     radius_ = 1
128     maxrows_ = 10
129     lang_ = "en"
130
131
132     hash = Hash.new
133     hash[:lat] = lat_
134     hash[:long] = long_
135     hash[:radius] = radius_
136     hash[:maxrows] = maxrows_
137     hash[:lang] = lang_
138
139     begin
140         r = Geonames::WebService.find_nearby_wikipedia(hash)
141     rescue
142         r = Geonames::WebService.find_nearby_wikipedia(hash)
143     end
144
145

```

```

146 # extract info from wikipedia article
147 r.each do |entry|
148   #title
149   title = entry.title
150
151   title = @dbh.escape_string(title)
152   title = Iconv.conv('latin1//IGNORE', 'utf-8', title)
153   title = self.escape_string(title)
154   #url
155   wikiurl = entry.wikipedia_url
156   #distance
157   distance = entry.distance
158   #summary
159   summary = entry.summary
160   #puts summary
161   summary = @dbh.escape_string(summary)
162   summary = Iconv.conv('latin1//IGNORE', 'utf-8', summary)
163   summary = self.escape_string(summary)
164
165   value = self.value_of_category_in_wiki(wikiurl, id)
166
167
168   #insert into DB
169   @dbh.query("INSERT INTO wikiarticle (picid, title, summary,
170             wikiurl, distance, value)
171             VALUES ('#{id}', '#{title}', '#{summary}', '#{wikiurl}
172             ', '#{distance}', '#{value}') ")
173
174 end
175
176 return r
177 end
178
179 # find occurrences of image category word in wikipedia article url
180 # returns number of occurrences of word given as argument
181 def value_of_category_in_wiki(url, id)
182
183   @dbh.connect
184
185   q = "Select category from image where id = '#{id}'"
186
187   r = @dbh.query(q)
188   row = r.fetch_hash
189   image_category = row["category"]
190
191   begin
192     page = Hpricot( open(url) )
193     content = (page/'/html/body').inner_text
194   rescue
195     content = (page/'/html/body').inner_text
196   end
197
198   h = Hash.new(0)
199
200   image_category.downcase!
201   content = content.to_s.downcase!
202   content.gsub!(/\W+/, ' ')
203
204   content.split.each do |w|
205     h[w] += 1
206   end
207 end

```

```

206
207     return h["#{image_category}"]
208 end
209
210
211 def escape_string(string)
212     string.gsub!(/'/, "'\''")
213     string.gsub!(/"/, "\"")
214     string.gsub!(/"/, "\"")
215     string.gsub!(/\\/, "\\")
216
217     return string
218 end
219 end

```

A.9 weatherhandler.rb

Listing A.9: WeatherHandler.rb

```

1  #!/usr/bin/env ruby
2  require "hpricot"
3  require "open-uri"
4  require 'DatabaseHandler'
5  require 'constants'
6
7  # Class for finding temperature for a given airport at any time > year
   1996
8  class WeatherHandler
9      def initialize()
10         # weather string should be
11         # @uri /ICAO/YEAR/MM/DD/ @uri_end
12         @uri = 'http://www.wunderground.com/history/airport/'
13         @uri_end = 'DailyHistory.html?req_city=NA&req_state=NA&
                req_statename=NA'
14
15         @dbh = DatabaseHandler.new()
16     end
17
18     def process_weather(filename)
19         @dbh.connect()
20
21         q = "Select id, date_time from image where filename = '#{filename}'
                "
22
23         r = @dbh.query(q)
24         row = r.fetch_hash
25         id = row["id"]
26         date_time = row["date_time"]
27
28         # no date time on image
29         if date_time.to_i == 0
30             @dbh.close()
31             return false
32         end
33
34         q = "Select gps_latitude, gps_longitude from image where id = '#{id}
                }'"
35
36         r = @dbh.query(q)
37         row = r.fetch_hash
38         lat = row["gps_latitude"]

```

```

39     lon = row["gps_longitude"]
40
41     if lat == nil || lon == nil
42         return 0
43     end
44
45     icao = self.find_nearest_airport(lat, lon)
46
47     if icao.include?(" ")
48         return 0
49     end
50
51     #format datetime
52     # returns array with (day, month, year, time)
53     #puts date_time
54     dtime = self.format_date_out(date_time)
55
56     if dtime == 0
57         return 0
58     end
59
60     temp = self.get_temperature(icao, dtime[3], dtime[2], dtime[0],
61                               dtime[1])
62
63     # update database with temperature
64     self.set_temperature(id, temp, icao)
65
66     # close DB handler
67     @dbh.close()
68
69     return 1
70 end
71
72 # function to find learest airport for gps lat long coordinates
73 def find_nearest_airport(lat, lon)
74     @dbh.connect()
75     offset = 0.1
76     lat = lat.to_f
77     lon = lon.to_f
78
79     # create offsets for searching
80     min_lat = lat - offset
81     max_lat = lat + offset
82     min_lon = lon - offset
83     max_lon = lon + offset
84
85     # DB query
86     q = "SELECT icao, station, country, lat, lon from airports WHERE
87         (lat BETWEEN '#{min_lat}' AND '#{max_lat}') AND
88         (lon BETWEEN '#{min_lon}' AND '#{max_lon}') AND
89         (icao IS NOT NULL)"
90
91     res = @dbh.query(q)
92
93     row = res.fetch_row
94     count = 0
95
96     # while no result query again with broader gps coordinate bounding
97     # box
98     while (row == nil) do
99         min_lat = min_lat - offset.to_f

```

```

99     max_lat = max_lat + offset.to_f
100    min_lon = min_lon - offset.to_f
101    max_lon = max_lon + offset.to_f
102
103    q = "SELECT icao, station, country, lat, lon from airports WHERE
104          (lat BETWEEN '#{min_lat}' AND '#{max_lat}') AND
105          (lon BETWEEN '#{min_lon}' AND '#{max_lon}') AND
106          (icao IS NOT NULL)"
107
108    res = @dbh.query(q)
109
110    row = res.fetch_row
111    count = count + 1
112    #printf "count %d      : %f : %f      : %f : %f \n",
113    # count, min_lat, max_lat, min_lon, max_lon
114  end
115
116  # close DB handler
117  @dbh.close()
118
119  # return the ICAO for the nearest airport
120  return row[0]
121 end
122
123 # find temperature for given airport and return this
124 def get_temperature(icao, time, year, day, month)
125
126   # connect to DB
127   @dbh.connect()
128
129   # truncate temperature table
130   @dbh.query("TRUNCATE TABLE temperature")
131
132   begin
133     page = Hpricot(URI.parse("http://www.wunderground.com/history/
134                          airport/#{icao}/#{year}/#{month}/#{day}/DailyHistory.html?
135                          req_city=NA&req_state=NA&req_statename=NA").read)
136   rescue
137     page = Hpricot(URI.parse("http://www.wunderground.com/history/
138                          airport/#{icao}/#{year}/#{month}/#{day}/DailyHistory.html?
139                          req_city=NA&req_state=NA&req_statename=NA").read)
140   end
141
142   #puts "http://www.wunderground.com/history/airport/#{icao}/#{year
143   }/#{month}/#{day}/DailyHistory.html?req_city=NA&req_state=NA&
144   req_statename=NA"
145
146   # find table with temperature contents
147   table = page.search("//table[@class='dataTable obsTable']")
148
149   # find rows that contains temperature contents
150   cells = table.search("tr").inner_text
151
152   # result set hash where time and temperatures are put in
153   hash = {}
154
155   l = 0
156   k = 0
157   cells.each do |k|
158
159     # find cells with time

```



```

155     if k.include?("AM") || k.include?("PM")
156         l = k.lstrip
157         l = l.rstrip
158         l = time_format(l)
159         hash["#{l}"] = 0
160     end
161
162     # find connecting temperature cell
163     if k.include?("°")
164         k = k.gsub!(/C/, "")
165         k = k.gsub!(/\302\240\302\260/, "")
166         k = k.rstrip
167         k = k.lstrip
168
169         # insert temperature in result set hash for given hour
170         if hash["#{l}"] == 0
171             hash["#{l}"] = k
172             #insert into DB
173             # encode time variables
174             l = l.split(':')
175             q = "INSERT INTO temperature (h, m, temp) VALUES ('#{l[0]}',
176                 '#{l[1]}', '#{k}')"
177             @dbh.query(q)
178         end
179     end
180
181     # debug, print out key values for hour-temperature result set
182     #hash.each do |k, v|
183     #   printf("%s , %s \n", k, v)
184     #end
185
186     # match time and return result
187     time = self.minute_match(time)
188     tmp = time.split(':')
189     hour = tmp[0].to_i
190     minute = tmp[1]
191     offset = 1
192
193     # create offsets for searching
194     hour_max = hour + offset
195     hour_min = hour
196
197     # DB query
198     q = "SELECT temp from temperature WHERE
199         (h BETWEEN '#{hour_min}' AND '#{hour_max}')"
200
201     res = @dbh.query(q)
202
203     row = res.fetch_row
204     count = 0
205
206     # find nearest temperature reading
207     while (row == nil) do
208         # create offsets for searching
209         hour_max = hour_max + offset
210         hour_min = hour_min - offset
211
212         # DB query
213         q = "SELECT temp from temperature WHERE
214             (h BETWEEN '#{hour_min}' AND '#{hour_max}')"
215         res = @dbh.query(q)

```

```
216
217     row = res.fetch_row
218     count = count + 1
219     if count == 12
220         return "None"
221     end
222 end
223
224 @dbh.close()
225
226 # return temperature
227 return row[0]
228 end
229
230 # change time format from AM and PM to digital format
231 # returns time in HH:MM format
232 def time_format(str)
233     length = str.length
234
235     if length == 7
236         hour = str[0, 1]
237         minutes = str[2, 2]
238         format = str[5, 2]
239
240         hour = hour.to_i + 12
241
242         if format.include?("AM") && hour == 24
243             hour = 00
244         end
245         if format.include?("AM") && hour != 00
246             hour = hour - 12
247         end
248         if format.include?("PM") && hour == 24
249             hour = 12
250         end
251
252         r = "#{hour}:#{minutes}"
253         return r
254
255     elsif length == 8
256         hour = str[0, 2]
257         minutes = str[3, 2]
258         format = str[6, 2]
259
260         hour = hour.to_i + 12
261
262         if format.include?("AM") && hour == 24
263             hour = 00
264         end
265         if format.include?("AM") && hour != 00
266             hour = hour - 12
267         end
268         if format.include?("PM") && hour == 24
269             hour = 12
270         end
271
272         r = "#{hour}:#{minutes}"
273         return r
274     end
275
276 end
277
```

```

278 # function to find if minutes is closest to 30 min or whole hour
279 # returns HH:00 or HH:30
280 def minute_match(time)
281
282 # split up time string
283 time_split = time.split(':')
284 minute = time_split[1].to_i
285
286 hour = 0
287 half_hour = 30
288
289 # check wether minutes are closest to hour or half an hour
290 if (minute < 15 || minute > 45)
291   result = "00"
292 else
293   result = 30
294 end
295
296 # returns time in HH:MM format with nearest half hour
297 #r = "%2s.%02d.%4s %s " % [day, month, year, time]
298 r = "%02s:%02s" % [time_split[0], result]
299 return r
300
301 end
302
303 # function to insert the temperature and ICAO airport code for image
304 # ID
305 def set_temperature(id, temp, icao)
306
307 # connect to DB
308 @dbh.connect
309
310 # query
311 q = "UPDATE image SET ICAO_code = '#{icao}', temperature = '#{temp
312   }' WHERE id = #{id}"
313
314 # insert query, update termpertatre and icao code for given image
315 @dbh.query(q)
316
317 # close DB connection
318 @dbh.close
319 end
320
321 # function to read date and time string
322 # returns array with (day, month, year, time)
323 def format_date_out(date)
324
325 if date == 0
326   return 0
327 end
328 tmp = date.split('.')
329
330 day = tmp[0]
331 month = tmp[1]
332
333 tmp2 = tmp[2].split(' ')
334 year = tmp2[0]
335 time = tmp2[1]
336
337 return day, month, year, time
338 end
339
340 end

```

338 [end](#)

Appendix B

Web front-end

B.1 index.php

Listing B.1: index.php

```
1 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://
   www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
2 <html xmlns="http://www.w3.org/1999/xhtml">
3 <head>
4 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
5 <title>crici - collecting relevant images context information</title>
6 <script src="http://maps.google.com/maps?file=api&v=2&key=
   ABQIAAAAK0cDiBSrjXH2x3i jAMWQ3hRpdw-fVY0wd7ns4lsWxWRxV-
   NTfhQyrGT9Ro7A0nmGgWC-t6aDdS92iA" type="text/javascript"></script>
7 <style type="text/css">
8 <!--
9 body {
10  background-color: #909690;
11 }
12 body,td,th {
13  font-family: Arial, Helvetica, sans-serif;
14  color: #FFFFFF;
15 }
16 a:link {
17  color: #FFFFCC;
18  text-decoration: none;
19 }
20 a:visited {
21  text-decoration: none;
22  color: #FFFFCC;
23 }
24 a:hover {
25  text-decoration: underline;
26  color: #FFFF00;
27 }
28 a:active {
29  text-decoration: none;
30  color: #FFFF00;
31 }
32 body {
33  margin-left: 0px;
34  margin-top: 0px;
35  background-color: #FFFFFF;
```

```

36 }
37 -->
38 </style>
39 <script type="text/javascript">
40
41 /*****
42 * Image w/ description tooltip- By Dynamic Web Coding (www.dyn-web.
      com)
43 * Copyright 2002-2007 by Sharon Paine
44 * Visit Dynamic Drive at http://www.dynamicdrive.com/ for full source
      code
45 *****/
46
47 /* IMPORTANT: Put script after tooltip div or
48 put tooltip div just before </BODY>. */
49
50 var dom = (document.getElementById) ? true : false;
51 var ns5 = (!document.all && dom || window.opera) ? true: false;
52 var ie5 = ((navigator.userAgent.indexOf("MSIE")>-1) && dom) ? true :
      false;
53 var ie4 = (document.all && !dom) ? true : false;
54 var nodyn = (!ns5 && !ie4 && !ie5 && !dom) ? true : false;
55
56 var origWidth, origHeight;
57
58 // avoid error of passing event object in older browsers
59 if (nodyn) { event = "nope" }
60
61 /////////////////////////////////////////////////// CUSTOMIZE HERE ///////////////////////////////////////////////////
62 // settings for tooltip
63 // Do you want tip to move when mouse moves over link?
64 var tipFollowMouse= true;
65 // Be sure to set tipWidth wide enough for widest image
66 var tipWidth= 400;
67 var tipHeight = 300;
68 var offX= 20; // how far from mouse to show tip
69 var offY= 12;
70 var tipFontFamily= "Verdana, arial, helvetica, sans-serif";
71 var tipFontSize= "8pt";
72 // set default text color and background color for tooltip here
73 // individual tooltips can have their own (set in messages arrays)
74 // but don't have to
75 var tipFontColor= "#000000";
76 var tipBgColor= "#DDECFE";
77 var tipBorderColor= "#000080";
78 var tipBorderWidth= 3;
79 var tipBorderStyle= "ridge";
80 var tipPadding= 4;
81
82 // tooltip content goes here (image, description, optional bgColor,
      optional textcolor)
83 var messages = new Array();
84 // multi-dimensional arrays containing:
85 // image and text for tooltip
86 // optional: bgColor and color to be sent to tooltip
87 messages[0] = new Array('red_balloon.gif', '', "#FFFFFF");
88 messages[1] = new Array('duck2.gif', '', "#DDECFE");
89 messages[2] = new Array('test.gif', '', 'black', 'white');
90
91 /////////////////////////////////////////////////// END OF CUSTOMIZATION AREA ///////////////////////////////////////////////////
92
93 // preload images that are to appear in tooltip

```

```

94 // from arrays above
95 if (document.images) {
96     var theImgs = new Array();
97     for (var i=0; i<messages.length; i++) {
98         theImgs[i] = new Image();
99         theImgs[i].src = messages[i][0];
100     }
101 }
102
103 // to layout image and text, 2-row table, image centered in top cell
104 // these go in var tip in doTooltip function
105 // startStr goes before image, midStr goes between image and text
106 var startStr = '<table height="' + tipHeight + '" width="' + tipWidth
107     + '><tr><td align="center" width="100%"><img ' +
108 var midStr = '" border="0"></td></tr><tr><td valign="top">';
109 var endStr = '</td></tr></table>';
110
111 ////////////////////////////////////////////////////
112 // initTip - initialization for tooltip.
113 // Global variables for tooltip.
114 // Set styles
115 // Set up mousemove capture if tipFollowMouse set true.
116 ////////////////////////////////////////////////////
117 var tooltip, tipcss;
118 function initTip() {
119     if (nodyn) return;
120     tooltip = (ie4)? document.all['tipDiv']: (ie5||ns5)? document.
121         getElementById('tipDiv'): null;
122     tipcss = tooltip.style;
123     if (ie4||ie5||ns5) { // ns4 would lose all this on rewrites
124         tipcss.width = tipWidth+"px";
125         tipcss.fontFamily = tipFontFamily;
126         tipcss.fontSize = tipFontSize;
127         tipcss.color = tipFontColor;
128         tipcss.backgroundColor = tipBgColor;
129         tipcss.borderColor = tipBorderColor;
130         tipcss.borderWidth = tipBorderWidth+"px";
131         tipcss.padding = tipPadding+"px";
132         tipcss.borderStyle = tipBorderStyle;
133     }
134     if (tooltip&&tipFollowMouse) {
135         document.onmousemove = trackMouse;
136     }
137 }
138
139 window.onload = initTip;
140
141 ////////////////////////////////////////////////////
142 // doTooltip function
143 // Assembles content for tooltip and writes
144 // it to tipDiv
145 ////////////////////////////////////////////////////
146 var t1,t2; // for setTimeouts
147 var tipOn = false; // check if over tooltip link
148
149 function doTooltip(evt,num,imgsrc,title, heig, widt) {
150     if (!tooltip) return;
151     if (t1) clearTimeout(t1); if (t2) clearTimeout(t2);
152     tipOn = true;
153     // set colors if included in messages array
154     if (messages[num][2]) var curBgColor = messages[num][2];
155     else curBgColor = tipBgColor;

```

```

154     if (messages[num][3]) var curFontColor = messages[num][3];
155     else curFontColor = tipFontColor;
156     if (ie4||ie5||ns5) {
157         var tip = startStr + ' height="' + heig + '" width="' + widt + '"
            src="' + imgsrc + midStr + '<span style="font-family:' +
            tipFontFamily + '; font-size:' + tipFontSize + '; color:' +
            curFontColor + ';"><center>' + title + '</center></span>' +
            endStr;
158         tipcss.backgroundColor = curBgColor;
159         tooltip.innerHTML = tip;
160     }
161     if (!tipFollowMouse) positionTip(evt);
162     else t1=setTimeout("tipcss.visibility='visible'",100);
163 }
164
165 var mouseX, mouseY;
166 function trackMouse(evt) {
167     standardbody=(document.compatMode=="CSS1Compat")? document.
        documentElement : document.body //create reference to common "
        body" across doctypes
168     mouseX = (ns5)? evt.pageX: window.event.clientX + standardbody.
        scrollLeft;
169     mouseY = (ns5)? evt.pageY: window.event.clientY + standardbody.
        scrollTop;
170     if (tipOn) positionTip(evt);
171 }
172
173 ///////////////////////////////////////////////////////////////////
174 // positionTip function
175 // If tipFollowMouse set false, so trackMouse function
176 // not being used, get position of mouseover event.
177 // Calculations use mouseover event position,
178 // offset amounts and tooltip width to position
179 // tooltip within window.
180 ///////////////////////////////////////////////////////////////////
181 function positionTip(evt) {
182     if (!tipFollowMouse) {
183         standardbody=(document.compatMode=="CSS1Compat")? document.
            documentElement : document.body
184         mouseX = (ns5)? evt.pageX: window.event.clientX + standardbody.
            scrollLeft;
185         mouseY = (ns5)? evt.pageY: window.event.clientY + standardbody.
            scrollTop;
186     }
187     // tooltip width and height
188     var tpWd = (ie4||ie5)? tooltip.clientWidth: tooltip.offsetWidth;
189     var tpHt = (ie4||ie5)? tooltip.clientHeight: tooltip.offsetHeight;
190     // document area in view (subtract scrollbar width for ns)
191     var winWd = (ns5)? window.innerWidth-20+window.pageXOffset:
        standardbody.clientWidth+standardbody.scrollLeft;
192     var winHt = (ns5)? window.innerHeight-20+window.pageYOffset:
        standardbody.clientHeight+standardbody.scrollTop;
193     // check mouse position against tip and window dimensions
194     // and position the tooltip
195     if ((mouseX+offX+tpWd)>winWd)
196         tipcss.left = mouseX-(tpWd+offX)+"px";
197     else tipcss.left = mouseX+offX+"px";
198     if ((mouseY+offY+tpHt)>winHt)
199         tipcss.top = winHt-(tpHt+offY)+"px";
200     else tipcss.top = mouseY+offY+"px";
201     if (!tipFollowMouse) t1=setTimeout("tipcss.visibility='visible' "
        ,100);

```



```

202     }
203
204     function hideTip() {
205         if (!tooltip) return;
206         t2=setTimeout("tipcss.visibility='hidden'",100);
207         tipOn = false;
208     }
209
210     document.write('<div id="tipDiv" style="position:absolute; visibility
211         :hidden; z-index:100"></div>')
212 </script>
213
214 </head>
215
216
217 <body>
218 <table width="1024" height="883" border="0" align="center" cellpadding=
219     "10" cellspacing="0" bgcolor="#7b8b7b">
220     <tr>
221         <td height="200" colspan="3" valign="top" background="images/
222             toplogo.jpg"><table width="529" border="0" align="right"
223                 cellpadding="0" cellspacing="0">
224
225                 <tr>
226                     <td width="536" align="center" height="80">
227
228                     <div align="right"><?php echo date("F j, H:i"); include_once(
229                         "helper.php"); ?></div></td>
230
231                 </tr>
232                 <tr>
233                     <td align="center" height="47">
234                     <form action="index.php?show=post_search" method="post" name=
235                         "search" target="_self">
236                         <input name="search" type="text" size="30" />
237                         <input name="set" type="submit" value="search" />
238                     </form>
239
240                     </td>
241                 </tr>
242                 <tr>
243                     <td align="center" colspan="3"></div></td>
245                 </tr>
246                 <tr>
247                     <td width="132" height="600" valign="top"><br />
248                     <?php include("menu.php") ; ?>&nbsp;</td>
249                     <td width="698" valign="top">
250                     <table width="620" border="0" cellpadding="0" cellspacing="0">
251                         <tr>
252                             <td width="518" valign="top">
253                             <?php
254                                 includeHere("show");
255                             ?>
256                             </td>
257                         </tr>
258                     </table>
259                     </td>
260                 </tr>
261                 <tr>
262                     <td width="134" valign="top"><br />
263                     <?php include("stat.php"); ?></td>
264                 </tr>

```

```

257 <tr>
258 <td colspan="3"><div align="center">
259 &copy; <a href="mailto:borge.jakobsen@gmail.com">B rge Jakobsen</a>
      > - <a href="http://www.uit.no" target="_blank">Universitetet
      i Troms ,</a> 2009</div></td>
260 </tr>
261 </table>
262 </body>
263 </html>

```

B.2 helper.php

Listing B.2: helper.php

```

1 <?php
2
3 # Global variables
4 $IMAGE_PATH = "C:/Users/B rge/Documents/My Dropbox/Dokumenter/
  Masteroppgave/code/images/";
5 $gMapskey = "ABQIAAAAKOcDiBSrjXH2x3ijAMWQ3hRpdw-fVY0wd7ns4lsWxWRxV-
  NTfhQyrGT9Ro7A0nmGgWC-t6aDds92ia";
6
7 # turn error reporting on
8 ini_set('display_errors', 1);
9 error_reporting(E_ALL|E_STRICT);
10
11 # Database functions
12 # connects to standard database, returns connection handler
13 function connectDB() {
14
15 # login info
16 $username = "root";
17 $password = "*****";
18 $database = "test";
19
20 # connect to DB
21 $conn = mysql_connect("localhost",$username,$password);
22
23 if(!$conn) {
24 die("Could not connect to DB");
25 }
26
27 mysql_select_db($database, $conn) or die( mysql_error());
28
29 return $conn;
30 }
31
32 # queries the DB, returns result row
33 function queryDB($query, $db_conn) {
34
35 if (!$db_conn) {
36 $db_conn = connectDB();
37 }
38
39 $q = $query;
40 $result = mysql_query($query, $db_conn);
41
42 $err = mysql_error();
43
44 if (!$result) {
45 echo "Error: ".$err;

```

```

46  }
47  return $result;
48
49  closeDB($db_conn);
50 }
51
52 #
53 # close DB connection
54 #
55 function closeDB($conn) {
56     mysql_close($conn);
57 }
58
59 #
60 # Include given argument, else insert standard page for php include in
    site navigation
61 #
62 function includeHere($arg) {
63     $ext = ".php";
64
65     if(isset($_GET[$arg])) {
66         $id = $_GET[$arg];
67
68         include($id.$ext);
69     }
70     else {
71         include('random.php');
72     }
73 }
74
75 # Image scaling functions
76 ////////////////////////////////////////////////////////////////////
77 // Scale images by width //
78 ////////////////////////////////////////////////////////////////////
79 function width_scale($file,$maxwidth) {
80     list($width,$height) = getimagesize($file);
81     if ($width > $maxwidth) {
82         $new_width = $maxwidth;
83         $dec_per = $new_width / $width * 100;
84         $new_height = $height / 100 * $dec_per;
85         return 'width="' . $new_width. " height=" . $new_height. "'";
86     }
87     else {
88         return 'width="' . $width. " height=" . $height. "'";
89     }
90 }
91
92
93 ////////////////////////////////////////////////////////////////////
94 // Scale images by height //
95 ////////////////////////////////////////////////////////////////////
96 function height_scale($file,$maxheight) {
97     list($width,$height) = getimagesize($file);
98     if ($height > $maxheight) {
99         $new_height = $maxheight;
100        $dec_per = $new_height / $height * 100;
101        $new_width = $width / 100 * $dec_per;
102        return 'width="' . $new_width. " height=" . $new_height. "'";
103    }
104    else {
105        return 'width="' . $width. " height=" . $height. "'";
106    }

```

```
107 }
108
109 /**
110 * Delete a file, or a folder and its contents
111 *
112 * @author Aidan Lister <aidan@php.net>
113 * @version 1.0.2
114 * @param string $dirname Directory to delete
115 * @return bool Returns TRUE on success, FALSE on failure
116 */
117 function rmdirr($dirname) {
118     // Sanity check
119     if (!file_exists($dirname)) {
120         return false;
121     }
122
123     // Simple delete for a file
124     if (is_file($dirname)) {
125         return unlink($dirname);
126     }
127
128     // Loop through the folder
129     $dir = dir($dirname);
130     while (false !== $entry = $dir->read()) {
131         // Skip pointers
132         if ($entry == '.' || $entry == '..') {
133             continue;
134         }
135
136         // Recurse
137         rmdirr("$dirname/$entry");
138     }
139
140     // Clean up
141     $dir->close();
142     return true;
143 }
144
145 # Time function return unix time in microseconds
146 function microtime_float()
147 {
148     list($usec, $sec) = explode(" ", microtime());
149     return ((float)$usec + (float)$sec);
150 }
151
152 # URI argument helper function
153 # number of arguments
154 function num_arguments() {
155     $numargs = func_num_args();
156     return $numargs;
157 }
158
159 # function to get the current url
160 function curPageURL() {
161     $pageURL = 'http';
162
163     $pageURL .= "://";
164
165     if ($_SERVER["SERVER_PORT"] != "80") {
166         $pageURL .= $_SERVER["SERVER_NAME"].":".$_SERVER["SERVER_PORT"].
            $_SERVER["REQUEST_URI"];
167     }
168 }
```

```
168     else {
169         $pageURL .= $_SERVER["SERVER_NAME"].$_SERVER["REQUEST_URI"];
170     }
171     return $pageURL;
172 }
173
174 # flickr function for finding related images
175 # returns array of 20 image urls
176 # variable number of arguments ($lat, $lon) or (($lat, $lon, $min_date,
177     $max_date)
178 function getFlickrImages($lat, $lon) {
179     # flickr api-key and secret for public images
180     $key = "e496cb4c3a379b2de0aae18f5528eb22";
181     $secret = "0aef1c50d532f48c";
182
183     # MYSQL datetime: 9999-12-31 23:59:59
184
185     $lat = round($lat,4);
186     $lon = round($lon,4);
187
188     $offset = 0.005;
189
190     $radius = 0.5;
191
192     #default date for search
193     $min_taken_date = "2006-12-31 00:00:00";
194     $max_taken_date = "2009-12-31 23:59:59";
195
196     #
197     # build the API URL to call
198     if(func_num_args() == 2) {
199         $params = array(
200             'api_key' => $key,
201             'secret' => $secret,
202             'format' => 'php_serial',
203             'method' => 'flickr.photos.search',
204             'min_taken_date' => $min_taken_date,
205             'max_taken_date' => $max_taken_date,
206             'lat' => $lat,
207             'lon' => $lon,
208             'radius' => $radius,
209         );
210     }
211     else {
212         $f_date = func_get_arg(2);
213         $t_date = func_get_arg(3);
214
215         $params = array(
216             'api_key' => $key,
217             'secret' => $secret,
218             'format' => 'php_serial',
219             'method' => 'flickr.photos.search',
220             'min_taken_date' => $f_date,
221             'max_taken_date' => $t_date,
222             'lat' => $lat,
223             'lon' => $lon,
224             'radius' => $radius,
225         );
226     }
227
228 }
```

```

229  $encoded_params = array();
230
231  foreach ($params as $k => $v) {
232      $encoded_params[] = urlencode($k).'='.urlencode($v);
233  }
234
235
236  #
237  # call the API and decode the response
238  #
239  $url = "http://api.flickr.com/services/rest?".implode('&',
          $encoded_params);
240
241  $rsp = file_get_contents($url);
242
243  $rsp_obj = unserialize($rsp);
244
245
246  $flickr_array = array();
247
248  if ($rsp_obj['stat'] == 'ok'){
249      $i = 0;
250
251      foreach(($rsp_obj['photos']['photo']) as $value) {
252          $id = $value['id'];
253          $owner = $value['owner'];
254          $secret = $value['secret'];
255          $title = $value['title'];
256          $farm = $value['farm'];
257          $server = $value['server'];
258
259          $flickr_array[$i] = array('id' => $id, 'owner' => $owner, 'secret
              ' => $secret, 'title' => $title, 'farm' => $farm, 'server' =>
              $server);
260
261          $i = $i+1;
262          if ($i == 20) {
263              break;
264          }
265          #echo'';
266      }
267
268      $a = array();
269
270      foreach ($flickr_array as $elem) {
271          $img_href = "http://www.flickr.com/photos/" . $elem['owner'] . "/" .
              $elem['id'];
272
273          $tmp_imgsrc = 'http://farm'. $elem['farm'] . '.static.flickr.com/' .
              $elem['server'] . '/' . $elem['id'] . '_' . $elem['secret'] . '.jpg';
274
275          $new_width = 390;
276          $new_height = 290;
277
278          array_push($a, '<a href="'. $img_href.'" target="_blank"
              onmouseover="doTooltip(event,0,\'' . $tmp_imgsrc . '\',\'' . $elem[
              'title'] . '\',\'' . $new_height . '\',\'' . $new_width . '\')" onmouseout="
              hideTip()"></a>');

```

```

279
280     }
281     return $a;
282 }else {
283     echo "Call error <br>";
284 }
285
286 }
287
288 ?>

```

B.3 image.class.php

Listing B.3: image.class.php

```

1 <?php
2
3 #####
4 # Thumbnail Image Class for Thumbnail Generator
5 #####
6 # For updates visit http://www.zubrag.com/scripts/
7 #####
8
9 class Zubrag_image {
10
11     var $save_to_file = true;
12     var $image_type = -1;
13     var $quality = 100;
14     var $max_x = 100;
15     var $max_y = 100;
16     var $cut_x = 0;
17     var $cut_y = 0;
18
19     function SaveImage($im, $filename) {
20
21         $res = null;
22
23         // ImageGIF is not included into some GD2 releases, so it might not
24         // work
25         // output png if gifs are not supported
26         if(($this->image_type == 1) && !function_exists('imagegif')) $this
27         ->image_type = 3;
28
29         switch ($this->image_type) {
30             case 1:
31                 if ($this->save_to_file) {
32                     $res = ImageGIF($im,$filename);
33                 }
34                 else {
35                     header("Content-type: image/gif");
36                     $res = ImageGIF($im);
37                 }
38                 break;
39             case 2:
40                 if ($this->save_to_file) {
41                     $res = ImageJPEG($im,$filename,$this->quality);
42                 }
43                 else {
44                     header("Content-type: image/jpeg");
45                     $res = ImageJPEG($im, NULL, $this->quality);
46                 }
47             }
48         }
49     }
50 }

```

```

45     break;
46     case 3:
47         if (PHP_VERSION >= '5.1.2') {
48             // Convert to PNG quality.
49             // PNG quality: 0 (best quality, bigger file) to 9 (worst
50                 quality, smaller file)
51             $quality = 9 - min( round($this->quality / 10), 9 );
52             if ($this->save_to_file) {
53                 $res = ImagePNG($im, $filename, $quality);
54             }
55             else {
56                 header("Content-type: image/png");
57                 $res = ImagePNG($im, NULL, $quality);
58             }
59         }
60         else {
61             if ($this->save_to_file) {
62                 $res = ImagePNG($im, $filename);
63             }
64             else {
65                 header("Content-type: image/png");
66                 $res = ImagePNG($im);
67             }
68         }
69     }
70     break;
71 }
72 return $res;
73 }
74
75 function ImageCreateFromType($type,$filename) {
76     $im = null;
77     switch ($type) {
78         case 1:
79             $im = ImageCreateFromGif($filename);
80             break;
81         case 2:
82             $im = ImageCreateFromJpeg($filename);
83             break;
84         case 3:
85             $im = ImageCreateFromPNG($filename);
86             break;
87     }
88     return $im;
89 }
90
91 // generate thumb from image and save it
92 function GenerateThumbFile($from_name, $to_name) {
93
94     // if src is URL then download file first
95     $temp = false;
96     if (substr($from_name,0,7) == 'http://') {
97         $tmpfname = tempnam("tmp/", "TmP-");
98         $temp = @fopen($tmpfname, "w");
99         if ($temp) {
100             @fwrite($temp, @file_get_contents($from_name)) or die("Cannot
101                 download image");
102             @fclose($temp);
103             $from_name = $tmpfname;
104         }
105     }
106     else {

```



```

105     die("Cannot create temp file");
106     }
107 }
108
109 // check if file exists
110 if (!file_exists($from_name)) die("Source image does not exist!");
111
112 // get source image size (width/height/type)
113 // orig_img_type 1 = GIF, 2 = JPG, 3 = PNG
114 list($orig_x, $orig_y, $orig_img_type, $img_sizes) = @GetImageSize(
    $from_name);
115
116 // cut image if specified by user
117 if ($this->cut_x > 0) $orig_x = min($this->cut_x, $orig_x);
118 if ($this->cut_y > 0) $orig_y = min($this->cut_y, $orig_y);
119
120 // should we override thumb image type?
121 $this->image_type = ($this->image_type != -1 ? $this->image_type :
    $orig_img_type);
122
123 // check for allowed image types
124 if ($orig_img_type < 1 or $orig_img_type > 3) die("Image type not
    supported");
125
126 if ($orig_x > $this->max_x or $orig_y > $this->max_y) {
127
128     // resize
129     $per_x = $orig_x / $this->max_x;
130     $per_y = $orig_y / $this->max_y;
131     if ($per_y > $per_x) {
132         $this->max_x = $orig_x / $per_y;
133     }
134     else {
135         $this->max_y = $orig_y / $per_x;
136     }
137
138 }
139 else {
140     // keep original sizes, i.e. just copy
141     if ($this->save_to_file) {
142         @copy($from_name, $to_name);
143     }
144     else {
145         switch ($this->image_type) {
146             case 1:
147                 header("Content-type: image/gif");
148                 readfile($from_name);
149                 break;
150             case 2:
151                 header("Content-type: image/jpeg");
152                 readfile($from_name);
153                 break;
154             case 3:
155                 header("Content-type: image/png");
156                 readfile($from_name);
157                 break;
158         }
159     }
160     return;
161 }
162
163 if ($this->image_type == 1) {

```

```

164     // should use this function for gifs (gifs are palette images)
165     $ni = imagecreate($this->max_x, $this->max_y);
166 }
167 else {
168     // Create a new true color image
169     $ni = ImageCreateTrueColor($this->max_x,$this->max_y);
170 }
171
172 // Fill image with white background (255,255,255)
173 $white = imagecolorallocate($ni, 255, 255, 255);
174 imagefilledrectangle( $ni, 0, 0, $this->max_x, $this->max_y, $white
175 );
176 // Create a new image from source file
177 $im = $this->ImageCreateFromType($orig_img_type,$from_name);
178 // Copy the palette from one image to another
179 imagepalettecopy($ni,$im);
180 // Copy and resize part of an image with resampling
181 imagecopyresampled(
182     $ni, $im,           // destination, source
183     0, 0, 0, 0,       // dstX, dstY, srcX, srcY
184     $this->max_x, $this->max_y, // dstW, dstH
185     $orig_x, $orig_y); // srcW, srcH
186
187 // save thumb file
188 $this->SaveImage($ni, $to_name);
189
190 if($temp) {
191     unlink($tmpfname); // this removes the file
192 }
193 }
194
195 }
196
197 ?>

```

B.4 images.php

Listing B.4: images.php

```

1 <h2>Images</h2>
2
3 <?php
4     $arg_img = "nr";
5
6     if (isset($_GET[$arg_img])) {
7         $id = $_GET[$arg_img];
8     }
9     else {
10        $id = 0;
11    }
12
13    # page properties
14    $imagesPerPage = 10;
15    $offset = $id;
16
17    $conn = connectDB();
18
19    # query DB
20    $q = queryDB("SELECT id from image", $conn);
21    $totalNrImages = (int)mysql_numrows($q);

```



```

128 echo '<br><br>';
129
130
131 # page navigation
132 $index = 1;
133 $added = $index + $imagesPerPage;
134
135 $counter = 0;
136 echo '&nbsp;&nbsp;&nbsp;';
137 while (($index + $imagesPerPage) < ($totalNrImages + $imagesPerPage))
    {
138     $url = $index - 1;
139     if($index >= $id && $index <= ($id+$imagesPerPage - 1)) {
140         echo '<strong>['.$index.'-'.(($index+$imagesPerPage - 1).')</
            strong>&nbsp;&nbsp;&nbsp;';
141     }
142     else {
143         echo '<a href="index.php?show=images&nr='.$url.'">['.$index.'-'.(
            $index+$imagesPerPage - 1).')</a>&nbsp;&nbsp;&nbsp;';
144     }
145     $index = $index + $imagesPerPage;
146     $counter++;
147
148     if($counter > 9) {
149         echo '&nbsp;&nbsp;&nbsp;<br>';
150     }
151 }
152 echo '<br><br>';
153 echo '</center>';
154 ?>

```

B.5 pic.php

Listing B.5: pic.php

```

1 <?php
2 # images path
3 $IMAGE_PATH = 'images/store/';
4
5 # URL variable
6 $arg = "id";
7
8 # include pic and info context if ID is set
9 if(isset($_GET[$arg])) {
10     # Image id
11     $id = $_GET[$arg];
12
13     $conn = connectDB();
14
15     // query DB
16     $result = queryDB("SELECT id, filename, date_time, category,
        gps_latitude, gps_longitude, location_name, country, temperature
        FROM image WHERE ID=$id", $conn);
17     $tag_result = queryDB("SELECT tag FROM tags WHERE picid=$id and
        source='panoramio'", $conn);
18     $tag_result2 = queryDB("SELECT tag FROM tags WHERE picid=$id and
        source='flickr'", $conn);
19     $tag_row = $row = mysql_fetch_array($tag_result , MYSQL_NUM);
20     $tag_num = mysql_numrows($tag_result);
21     $tag_row2 = $row = mysql_fetch_array($tag_result2 , MYSQL_NUM);
22     $tag_num2 = mysql_numrows($tag_result2);

```

```

23 $num = mysql_numrows($result);
24
25
26 // get row of results from query
27 $row = mysql_fetch_array($result, MYSQL_NUM);
28
29 closeDB($conn);
30
31 $img = $IMAGE_PATH.$row[1];
32
33 echo "
34
35 <table width=\"610\" border=\"0\" cellpadding=\"0\" cellspacing
    =\"0\">
36 <tr>
37
38 <td colspan=\"2\">;
39 echo '<center></
    center>';
40
41 echo "</td>
42 <tr>
43 <td width=\"180\" height=\"20\"></td>
44 <td width=\"585\" height=\"20\"></td>
45 </tr>
46 <tr>
47 <td height=\"20\">ID:</td>
48 <td width=\"585\" height=\"20\">$row[0]</td>
49 </tr>
50 <tr>
51 <td height=\"20\">Category:</td>
52 <td width=\"585\" height=\"20\">$row[3]</td>
53 </tr>
54 <tr>
55 <td height=\"20\">Filename:</td>
56 <td height=\"20\">$row[1]</td>
57 </tr>
58 <tr>
59 <td height=\"20\">Date/time:</td>
60 <td height=\"20\">$row[2]</td>
61 </tr>
62 <tr>
63 <td height=\"20\">Location name:</td>
64 ";
65 if($row[7] == NULL) {
66 echo "<td height=\"20\">N/A</td>";
67 } else {
68 echo "<td height=\"20\">". $row[6]. "</td>";
69 }
70 echo "
71 </tr>
72 <tr>
73 <td height=\"20\">Country:</td>;
74 if($row[7] == NULL) {
75 echo "<td height=\"20\">N/A</td>";
76 } else {
77 echo "<td height=\"20\">". utf8_encode($row[7]). "</td>";
78 }
79 echo "
80 </tr>
81 <tr>
82 <td height=\"20\">GPS coordinates:</td>;

```

```

83     if($row[7] == NULL) {
84         echo "<td height=\"20\">N/A</td>";
85     } else {
86         echo "<td height=\"20\">Lat: ".$row[4]. " Lon: ".$row[5]. "</td>";
87     }
88     echo "
89 </tr>
90 <tr>
91     <td height=\"20\">Weather data:</td>";
92     if($row[8] == NULL) {
93         echo "<td height=\"20\">N/A</td>";
94     } else {
95         echo "<td height=\"20\">Approximate temperature: ".$row[8]. "
96         C</td>";
97     }
98     echo "
99 <tr>
100     <td width=\"220\" height=\"20\">Panoramio top 5 tags:</td>
101     <td height=\"20\">";
102     $c = 1;
103     while ($c < $stag_num) {
104         $stag_row = mysql_fetch_array($stag_result, MYSQL_NUM);
105         echo "'".utf8_encode($stag_row[0])."' ";
106         $c = $c + 1;
107     }
108     echo" </td></tr>
109 <tr>
110     <td width=\"220\" height=\"20\">Flickr top 5 tags:</td>
111     <td height=\"20\">";
112     $c = 1;
113     while ($c < $stag_num2) {
114         $stag_row2 = mysql_fetch_array($stag_result2, MYSQL_NUM);
115         echo "'".utf8_encode($stag_row2[0])."' ";
116         $c = $c + 1;
117     }
118     echo" </td>
119 </tr>
120 <tr>
121     <td colspan =\"2\" height=\"20\"><center><h3>Placement on map</
122     h3></center></td>
123 </tr>
124 <tr>";
125     if ($row[7] == NULL) {
126         echo "<td colspan=\"2\"><center>N/A</center></td>";
127     } else {
128         echo "<td colspan=\"2\"><div id=\"map\" style=\"width: 610px;
129         height: 300px\"></div></td>";
130     }
131     echo "
132 </tr>
133 <tr>";
134     if ($row[7] == NULL) {
135         echo "<td colspan=\"2\"><center>N/A</center></td>";
136     } else {
137         echo "<td colspan=\"2\"><iframe style=\"border: none;\" src=\"
138         http://www.panoramio.com/plugin.php?lt=$row[4]&ln=$row[5]&z
139         =5&k=0\" width=\"610px\" height=\"300px\"></iframe></td>";

```

```

138     }
139     echo "
140     </tr>
141     </table>";
142
143 }
144 ?>
145
146 <script type="text/javascript">
147 //
148 &lt;?php
149     $arg_img = "id";
150     $id = $_GET[$arg_img];
151
152     $conn = connectDB();
153
154     // query DB
155     $result = queryDB("SELECT gps_latitude, gps_longitude FROM image
156         WHERE ID=$id", $conn);
157
158     $num = mysql_numrows($result);
159
160     // get row of results from query
161     $row = mysql_fetch_array($result, MYSQL_NUM);
162
163     echo 'var map = new GMap2(document.getElementById("map"));;';
164     echo 'map.addControl(new GLargeMapControl());';
165     echo 'map.addControl(new GMapTypeControl());';
166     echo 'map.addControl(new GScaleControl());';
167     echo 'map.setCenter(new GLatLng('.$row[0].', '.$row[1].'), 12,
168         G_NORMAL_MAP);';
169
170     // Creates a marker whose info window displays the given number
171     echo ' function createMarker(point, number)';
172     echo ' {';
173     echo '     var marker = new GMarker(point);';
174     // Show this markers index in the info window when it is clicked
175     echo '     var html = number;';
176     echo '     GEvent.addListener(marker, "click", function() {marker.
177         openInfoWindowHtml(html);});';
178     echo '     return marker;';
179     echo ' }';
180
181     closeDB($conn);
182
183     echo "var point = new GLatLng(" . $row[0] . ", " . $row[1] . ");\n";
184     # echo "var marker = createMarker(point, '" . addslashes("HEIATIL") .
185         "' );\n";
186     # echo "map.addOverlay(marker);\n";
187     echo "map.addOverlay(new GMarker(point));";
188     echo "\n";
189 ?&gt;
190 //]]&gt;
191 &lt;/script&gt;
192 &lt;?php
193     echo '&lt;a name="flickr"&gt;&lt;/a&gt;';
194     echo '&lt;br&gt;&lt;center&gt;&lt;h3&gt;Flickr related images:&lt;/h3&gt;&lt;/center&gt;';
195
196     $month = array(1 =&gt; "January", 2 =&gt; "February", 3 =&gt; "March", 4 =&gt; "
197         April", 5 =&gt; "May", 6 =&gt; "June", 7 =&gt; "July", 8 =&gt; "August", 9 =&gt;
198         "September", 10 =&gt; "October", 11 =&gt; "November", 12 =&gt; "December"
</pre>
</div>
```



```

    );
194 $arg_img = "id";
195 $id = $_GET[$arg_img];
196
197 $conn = connectDB();
198
199 // query DB
200 $result = queryDB("SELECT gps_latitude, gps_longitude FROM image
    WHERE ID=$id", $conn);
201
202 $num = mysql_numrows($result);
203
204 // get row of results from query
205 $row = mysql_fetch_array($result, MYSQL_NUM);
206
207
208 # if geolocation
209 if($row[0] != NULL) {
210     echo '<table width="610" border="0" cellspacing="5" cellpadding
        ="0">';
211
212     # check id date is set
213     if(count($_POST) > 0) {
214         if ((int)$_POST['fmonth'] < 10) {
215             $_POST['fmonth'] = "0".$_POST['fmonth'];
216         }
217         if ((int)$_POST['fday'] < 10) {
218             $_POST['fday'] = "0".$_POST['fday'];
219         }
220         if ((int)$_POST['tmonth'] < 10) {
221             $_POST['tmonth'] = "0".$_POST['tmonth'];
222         }
223         if ((int)$_POST['tday'] < 10) {
224             $_POST['tday'] = "0".$_POST['tday'];
225         }
226         $from_date = $_POST['fyear']."-".$_POST['fmonth']."-".$_POST['
            fday']." 00:00:00";
227         $to_date = $_POST['tyear']."-".$_POST['tmonth']."-".$_POST['tday'
            ]." 23:59:59";
228
229         # get the images for posted date
230         $flickr_images = getFlickrImages($row[0], $row[1], $from_date,
            $to_date );
231     }
232     else {
233         # get the images for standard last year date
234         $flickr_images = getFlickrImages($row[0], $row[1]);
235     }
236
237     $i = 0;
238     echo '<center>';
239     foreach ($flickr_images as $img_html) {
240         echo $img_html."&nbsp;";
241
242         $i = $i + 1;
243         if ($i == 5) {
244             echo '<br>';
245             $i = 0;
246         }
247     }
248     # get current url
249     $currurl = curPageURL();

```

```

250
251     echo '</table>';
252     echo "<center><br>Only show images taken between dates:</center><br>
253     >";
254     echo '
255
256     <center>
257     <form id="form1" name="date" method="post" action="'. $currurl. '#
258     flickr">
259     <label>Day
260     <select name="fday" id="fday">';
261
262     for($i = 1; $i <= 31; $i += 1) {
263         if(isset($_POST['fday'])) {
264             if($i == $_POST['fday']) {
265                 echo '<option value="'. $i. '" selected="selected" >'. $i. '
266                 </option>';
267             }
268             else {
269                 echo '<option value="'. $i. '" >'. $i. '</option>';
270             }
271         }
272     }
273     echo '
274     </select>
275     </label>
276     <label>Month
277     <select name="fmonth" id="fmonth">';
278
279     for($i = 1; $i <= 12; $i += 1) {
280         if(isset($_POST['fmonth'])) {
281             if($i == $_POST['fmonth']) {
282                 echo '<option value="'. $i. '" selected="selected" >'.
283                 $month[$i]. '</option>';
284             }
285             else {
286                 echo '<option value="'. $i. '" >'. $month[$i]. '</option>';
287             }
288         }
289         else {
290             echo '<option value="'. $i. '" >'. $month[$i]. '</option>';
291         }
292     }
293     echo '
294     </select>
295     </label>
296     <label>Year
297     <select name="fyear" id="fyear">';
298     for($i = 1997; $i <= 2009; $i += 1) {
299         if(isset($_POST['fyear'])) {
300             if($i == $_POST['fyear']) {
301                 echo '<option value="'. $i. '" selected="selected" >'. $i. '
302                 </option>';
303             }
304             else {
305                 echo '<option value="'. $i. '" >'. $i. '</option>';
306             }
307         }
308     }

```

```

307         else {
308             echo '<option value="'. $i. ' ">' . $i. ' </option>';
309         }
310     }
311     echo '
312 </select>
313 </label>
314 <br>
315 <label>Day
316 <select name="tday" id="tday">';
317
318     for($i = 1; $i <= 31; $i += 1) {
319         if(isset($_POST['tday'])) {
320             if($i == $_POST['tday']) {
321                 echo '<option value="'. $i. ' " selected="selected" >' . $i. '
322                 </option>';
323             }
324             else {
325                 echo '<option value="'. $i. ' ">' . $i. ' </option>';
326             }
327         }
328         else {
329             echo '<option value="'. $i. ' ">' . $i. ' </option>';
330         }
331     };
332     echo '
333 </select>
334 </label>
335 <label>Month
336 <select name="tmonth" id="tmonth">';
337
338     for($i = 1; $i <= 12; $i += 1) {
339         if(isset($_POST['tmonth'])) {
340             if($i == $_POST['tmonth']) {
341                 echo '<option value="'. $i. ' " selected="selected" >' .
342                 $month[$i]. ' </option>';
343             }
344             else {
345                 echo '<option value="'. $i. ' ">' . $month[$i]. ' </option>';
346             }
347         }
348         else {
349             echo '<option value="'. $i. ' ">' . $month[$i]. ' </option>';
350         }
351     }
352     echo '
353 </select>
354 </label>
355 <label>Year
356 <select name="tyear" id="tyear">';
357     for($i = 1997; $i <= 2009; $i += 1) {
358         if(isset($_POST['tyear'])) {
359             if($i == $_POST['tyear']) {
360                 echo '<option value="'. $i. ' " selected="selected" >' . $i. '
361                 </option>';
362             }
363             else {
364                 echo '<option value="'. $i. ' ">' . $i. ' </option>';
365             }
366         }
367         else {
368             echo '<option value="'. $i. ' ">' . $i. ' </option>';

```

```

366     }
367     }
368     echo '
369     </select>
370     </label>
371     <br />
372     <label>
373     <input type="submit" name="update" id="update" value="Update" />
374     </label>
375     </form>
376     </center>';
377     echo '</center>';
378
379 }
380
381 else {
382     echo '<center>N/A</center>';
383     echo '<br>';
384 }
385
386 ?>
387 <?php
388     # insert wikipedia related material
389     echo '<br><center><h3>Geographically related article(s) - Wikipedia/<
390     # URL variable
391     $arg = "id";
392
393     if ($row[0] == NULL) {
394         echo "<center>N/A</center>";
395     }
396     else {
397         # include pic and info context if ID is set
398         if(isset($_GET[$arg])) {
399             # Image id
400             $id = $_GET[$arg];
401
402             $conn = connectDB();
403
404             // query DB
405             $result = queryDB("SELECT title, summary, wikiurl, distance,
406                 value FROM wikiarticle WHERE picid=$id ORDER BY value DESC",
407                 $conn);
408
409             $num = mysql_numrows($result);
410
411             closeDB($conn);
412
413             if($num) {
414                 echo '<table width="610" border="0" cellspacing="5" cellpadding
415                 ="0">';
416
417                 while ($row = mysql_fetch_array($result, MYSQL_NUM)) {
418                     echo '
419                     <tr>
420                     <td><strong>'.utf8_encode($row[0]).'</strong><br>-Image
421                     category rating:&nbsp;';
422                     if ($row[4] == -1) {
423                         echo 'unknown';
424                     }
425                     else {
426                         for ($i = 0; $i < $row[4]; $i += 1) {

```

```

423             echo '&nbsp;';
424             if($i == 10) {
425                 break;
426             }
427         }
428         echo '<small>'.$row[4].'/</small>';
429     }
430
431
432
433         echo '</td>
434     </tr>
435     <tr>';
436         echo '<td>'.utf8_encode($row[1]).' &nbsp; <u><a href=' .
437             $row[2].' target=\"_blank\" ><em>Read more...</em
438             ></a></u></td>';
439         echo '</tr>
440     <tr>
441         <td>Distance from picture: '.$row[3].'/<br><br></td>
442     </tr>';
443     }
444     echo '</table>';
445 }
446 }
447
448 # insert image categorizational related material
449 echo '<br><center><h3>Image categorization related context</h3></
450     center>';
451 $arg = "id";
452
453 # include pic and info context if ID is set
454 if(isset($_GET[$arg])) {
455     # Image id
456     $id = $_GET[$arg];
457     $conn = connectDB();
458
459     // query DB
460     $result = queryDB("SELECT title, summary, url, source, cat_value,
461         loc_value FROM related WHERE picid=$id ORDER BY cat_value desc"
462         , $conn);
463
464     $num = mysql_numrows($result);
465
466     closeDB($conn);
467
468     if($num) {
469         echo '<table width="610" border="0" cellspacing="5" cellpadding
470             ="0">';
471
472         while ($row = mysql_fetch_array($result, MYSQL_NUM)) {
473             echo '
474             <tr>
475             <td><strong>'.utf8_encode($row[0]).'/</strong><br>-Image
476             category rating:&nbsp;';
477             if ($row[4] == -1) {
478                 echo 'unknown';
479             }
480             else {
481                 for ($i = 0; $i < $row[4]; $i += 1) {

```

```

478             echo '&nbsp;';
480             if($i == 10) {
481                 break;
482             }
483             echo '<small>'.$row[4].'/</small>';
484         }
485
486
487         echo '</td>
488     </tr>
489     <tr>
490         <td>-Locationy rating:&nbsp;';
491         if ($row[5] == -1) {
492             echo 'unknown';
493         }
494         else {
495             for ($j = 0; $j < $row[5]; $j += 1) {
496                 echo '&nbsp;';
498                 if($j == 10) {
499                     break;
500                 }
501             }
502             echo '<small>'.$row[5].'/</small>';
503         }
504
505         echo '</td>
506     </tr>
507 <tr>;
508     echo '<td>'.utf8_encode($row[1]).' &nbsp;'; <u><a href=' .
509         $row[2].' target="_blank\" ><em>Read more...</em></a
510         ></u></td>';
511     echo '</tr>
512 <tr>
513     <td>Source: '.$row[3].'<br><br></td>
514 </tr>';
515 }
516 echo '</table>';
517 }
518 }
519 ?>

```

Listing B.6: postdir.php

```

1 <?php
2 $url = $_POST['url'];
3
4 echo "You set the directory: ".$url;
5
6
7 ?>

```

Listing B.7: postsearch.php

```

1 <h2>Search results</h2>
2 <?php

```

```

3  $query = $_POST['search'];
4
5  # images path
6  $IMAGE_PATH = 'images/store/';
7
8  # URL variable
9  $arg = "search";
10
11 # include pic and info context if ID is set
12 if(isset($query)) {
13     $conn = connectDB();
14
15     // query DB
16     $start_timer = microtime_float();
17     $result = queryDB("SELECT id, filename, category, location_name,
18         country FROM image WHERE filename LIKE '%$query%' OR
19         location_name LIKE '%$query%' OR country LIKE '%$query%'",
20         $conn);
21     $result2 = queryDB("SELECT picid FROM wikiarticle WHERE title LIKE
22         '%$query%' OR summary LIKE '%$query%' OR wikiurl LIKE '%$query%'
23         '", $conn);
24     $result3 = queryDB("SELECT picid FROM related WHERE title LIKE '%
25         $query%' OR summary LIKE '%$query%'", $conn);
26     $end_timer = microtime_float();
27
28     $search_time = $end_timer - $start_timer;
29
30     printf("Search done in %1.4f seconds for '%s', ", $search_time,
31         $query);
32
33     # collect results from both search tables
34     $total_results = array();
35     $t_res = $result;
36
37     while($row = mysql_fetch_array($result, MYSQL_NUM)) {
38         array_push($total_results, $row[0]);
39         array_push($total_results, $row[1]);
40     }
41
42     $t_res2 = $result2;
43
44     while($row = mysql_fetch_array($result2, MYSQL_NUM)) {
45         if(!in_array($row[0], $total_results, TRUE)) {
46             array_push($total_results, $row[0]);
47             # get filename
48             $tmp_res = queryDB("SELECT filename FROM image WHERE id = '$row
49                 [0]'", $conn);
50             $tmp = mysql_fetch_array($tmp_res, MYSQL_NUM);
51             array_push($total_results, $tmp[0]);
52         }
53     }
54
55     $t_res3 = $result3;
56     while($row = mysql_fetch_array($result3, MYSQL_NUM)) {
57         if(!in_array($row[0], $total_results, TRUE)) {
58             array_push($total_results, $row[0]);
59             # get filename
60             $tmp_res = queryDB("SELECT filename FROM image WHERE id = '$row
61                 [0]'", $conn);
62             $tmp = mysql_fetch_array($tmp_res, MYSQL_NUM);
63             array_push($total_results, $tmp[0]);
64         }
65     }

```

```

56     }
57
58     $num = count($total_results);
59
60     echo 'gave <strong>'.($num/2).'

```

Listing B.8: random.php

```

1 <h2>Random six images</h2>
2
3 <?php
4     $conn = connectDB();
5
6     // query DB
7     $result = queryDB("SELECT id, filename, date_time, category, country
                        FROM image ORDER BY RAND() LIMIT 6", $conn);
8
9     $num = mysql_numrows($result);
10
11     // Display records from the table
12     echo "<table border='0' cellspacing='5' cellpadding='2'>";
13     while ($row = mysql_fetch_array($result, MYSQL_NUM)) {
14         echo     "<tr>
15                 <td width='250' rowspan='5' bgcolor='#333333' align='
                    center'><a href=\"index.php?show=pic&id=$row[0]\"

```



```

        target="_self"><img src='thumbnailer.php?src=$row
16         [1]&x=250&y=187&f=0' /></a></td>
        <td>ID: $row[0]</td>
17     </tr>
18     <tr>
19         <td>Filename: $row[1]</td>
20     </tr>
21     <tr>
22         <td>Date time: $row[2]</td>
23     </tr>
24     <tr>
25         <td>Category: $row[3]</td>
26     </tr>
27     <tr>
28         <td>
29             ";
30             if($row[4] != NULL) {
31                 echo "<img src='images/globe.gif' alt='This image has
                    GPS coordinates'>";
32             }
33
34             echo "</td>
35     </tr>
36     <tr>
37         <td colspan='2'><hr></td>
38     </tr>";
39 }
40 echo "</table>";
41
42 closeDB($conn);
43 ?>

```

Listing B.9: stat.php

```

1 <?php
2
3 $show = "show";
4 $id = "id";
5
6 if(isset($_GET[$show])) {
7     if(isset($_GET[$id])) {
8
9         # panoramio get images in geographic offset
10        echo "<center>Panoramio&copy; <br> Related Images:<br><br></
            center>";
11        $conn = connectDB();
12
13        $id = $_GET[$id];
14        // query DB
15
16        $result = queryDB("SELECT gps_latitude, gps_longitude FROM image
            WHERE ID=$id", $conn);
17
18        $num = mysql_numrows($result);
19
20        // get row of results from query
21        $row = mysql_fetch_array($result, MYSQL_NUM);
22
23        if($row[1] == NULL) {
24            echo "N/A<br><br>";
25        }
26        else {

```

```

27
28     $lat = $row[0];
29     $lon = $row[1];
30     $offset = 0.0005;
31     $minx = $lon - $offset;
32     $miny = $lat - $offset;
33     $maxx = $lon + $offset;
34     $maxy = $lat + $offset;
35
36     $her = file_get_contents('http://www.panoramio.com/map/
        get_panoramas.php?order=upload_date&set=full&from=0&to=20&
        minx='.$minx.'&miny='.$miny.'&maxx='.$maxx.'&maxy='.$maxy.'
        &size=thumbnail');
37
38     #echo $her."<br>";
39
40     $object = json_decode($her);
41
42     echo "<center>";
43
44     $i = 0;
45     foreach(($object->photos) as $value) {
46         if ($i == 20)
47             break;
48         $upload_date = $value->upload_date;
49         $image_thumb_url = $value->photo_file_url;
50         $page_url = $value->photo_url;
51         $title = $value->photo_title;
52         $id = $value->photo_id;
53
54         $img_url = "http://mw2.google.com/mw-panoramio/photos/medium/
            ".$id.".jpg";
55
56         $new_width = 390;
57         $new_height = 290;
58
59         echo '<a href="'.$page_url.'" target="_blank" onmouseover="
            doTooltip(event,0,\''.$img_url.\',\''.$title.\','.
            $new_height.' ,'.$new_width.'" onmouseout="hideTip()" ">
            ;
60         echo '';
61         echo '</a><br><br>';
62
63         $i = $i + 1;
64     }
65
66 }
67 echo "<small>&copy;Panoramio</small>";
68 echo "</center>";
69 }
70 }
71
72 ?>

```

Listing B.10: thumbnailer.php

```

1 <?php
2
3 #####
4 # Thumbnail Image Generator 1.3
5 #####

```

```
6 # Visit http://www.zubrag.com/scripts/ for updates
7 #####
8
9 // REQUIREMENTS:
10 // PHP 4.0.6 and GD 2.0.1 or later
11 // May not work with GIFs if GD2 library installed on your server
12 // does not support GIF functions in full
13
14 // Parameters:
15 // src - path to source image
16 // dest - path to thumb (where to save it)
17 // x - max width
18 // y - max height
19 // q - quality (applicable only to JPG, 1 to 100, 100 - best)
20 // t - thumb type. "-1" - same as source, 1 = GIF, 2 = JPG, 3 = PNG
21 // f - save to file (1) or output to browser (0).
22
23 // Sample usage:
24 // 1. save thumb on server
25 // http://www.zubrag.com/thumb.php?src=test.jpg&dest=thumb.jpg&x=100&y
    =50
26 // 2. output thumb to browser
27 // http://www.zubrag.com/thumb.php?src=test.jpg&x=50&y=50&f=0
28
29
30 // Below are default values (if parameter is not passed)
31
32 // save to file (true) or output to browser (false)
33 $save_to_file = false;
34
35 // Quality for JPEG and PNG.
36 // 0 (worst quality, smaller file) to 100 (best quality, bigger file)
37 // Note: PNG quality is only supported starting PHP 5.1.2
38 $image_quality = 50;
39
40 // resulting image type (1 = GIF, 2 = JPG, 3 = PNG)
41 // enter code of the image type if you want override it
42 // or set it to -1 to determine automatically
43 $image_type = -1;
44
45 // maximum thumb side size
46 $max_x = 100;
47 $max_y = 100;
48
49 // cut image before resizing. Set to 0 to skip this.
50 $cut_x = 0;
51 $cut_y = 0;
52
53 // Folder where source images are stored (thumbnails will be generated
    from these images).
54 // MUST end with slash.
55 $images_folder = 'C:/Program Files (x86)/Apache Software Foundation/
    Apache2.2/htdocs/cric/images/store/';
56
57 // Folder to save thumbnails, full path from the root folder, MUST end
    with slash.
58 // Only needed if you save generated thumbnails on the server.
59 // Sample for windows: c:/wwwroot/thumbs/
60 // Sample for unix/linux: /home/site.com/htdocs/thumbs/
61 $thumbs_folder = 'C:/Program Files (x86)/Apache Software Foundation/
    Apache2.2/htdocs/cric/images/store/thumb/';
62
```

```

63
64 ///////////////////////////////////////////////////////////////////
65 /////////////////////////////////////////////////////////////////// DO NOT EDIT BELOW
66 ///////////////////////////////////////////////////////////////////
67
68 $to_name = '';
69
70 if (isset($_REQUEST['f'])) {
71     $save_to_file = intval($_REQUEST['f']) == 1;
72 }
73
74 if (isset($_REQUEST['src'])) {
75     $from_name = urldecode($_REQUEST['src']);
76 }
77 else {
78     die("Source file name must be specified.");
79 }
80
81 if (isset($_REQUEST['dest'])) {
82     $to_name = urldecode($_REQUEST['dest']);
83 }
84 else if ($save_to_file) {
85     die("Thumbnail file name must be specified.");
86 }
87
88 if (isset($_REQUEST['q'])) {
89     $image_quality = intval($_REQUEST['q']);
90 }
91
92 if (isset($_REQUEST['t'])) {
93     $image_type = intval($_REQUEST['t']);
94 }
95
96 if (isset($_REQUEST['x'])) {
97     $max_x = intval($_REQUEST['x']);
98 }
99
100 if (isset($_REQUEST['y'])) {
101     $max_y = intval($_REQUEST['y']);
102 }
103
104 if (!file_exists($images_folder)) die('Images folder does not exist (
    update $images_folder in the script)');
105 if ($save_to_file && !file_exists($thumbs_folder)) die('Thumbnails
    folder does not exist (update $thumbs_folder in the script)');
106
107 // Allocate all necessary memory for the image.
108 // Special thanks to Alecos for providing the code.
109 ini_set('memory_limit', '-1');
110
111 // include image processing code
112 include('image.class.php');
113
114 $img = new Zubrag_image;
115
116 // initialize
117 $img->max_x      = $max_x;
118 $img->max_y      = $max_y;
119 $img->cut_x      = $cut_x;
120 $img->cut_y      = $cut_y;
121 $img->quality    = $image_quality;
122 $img->save_to_file = $save_to_file;

```

```

123 $img->image_type = $image_type;
124
125 // generate thumbnail
126 $img->GenerateThumbFile($images_folder . $from_name, $thumbs_folder .
    $to_name);
127
128 ?>

```

Listing B.11: upload.php

```

1 <h2>Upload</h2>
2
3 Type in the directory location of the images:
4
5 <form action="index.php?show=upload" method="post" name="directory"
    target="_self">
6   <input name="url" type="text" size="60" />
7   <input name="set" type="submit" value="Select" />
8 </form>
9
10 <p><br>
11   E.g. c:\Pictures</p>
12 <br />
13
14 <?php
15
16 if(isset($_POST['url'])) {
17   $url = $_POST['url'];
18   print "You set the directory: \"$.url.\"";
19   print "<br><br>";
20   print "Images will now be processed...";
21
22   # connect to DB
23   $conn = connectDB();
24
25   # add slashes
26   $url2 = addslashes($url, '\\');
27
28   # insert into DB
29   $res = mysql_query("UPDATE settings SET dir = \"$.url2.\" WHERE id =
    1");
30
31   #echo "<br>".$res;
32
33   closeDB($conn);
34 }
35
36 ?>

```

Appendix C

Results

C.1 Flickr location names results

Listing C.1: "Location names from Flickr"

```
1 Filename: 01_notre_dame.jpg
2 Accuracy:      Name:                               Type:
3 1              France                             country
4 2              France                             country
5 3              Ile-de-France                       region
6 4              Ile-de-France                       region
7 5              Ile-de-France                       region
8 6              Paris                               county
9 7              Paris                               county
10 8             Paris                               county
11 9             Paris+4e+Arrondissement             locality
12 10            Paris+4e+Arrondissement             locality
13 11            Paris+4e+Arrondissement             locality
14 12            Les+Iles                           neighbourhood
15 13            Les+Iles                           neighbourhood
16 14            Les+Iles                           neighbourhood
17 15            Les+Iles                           neighbourhood
18 16            Les+Iles                           neighbourhood
19
20 Filename: 02_nidarosdomen.jpg
21 Accuracy:      Name:                               Type:
22 1              Norway                             country
23 2              Norway                             country
24 3              Sor-Trondelag                       region
25 4              Sor-Trondelag                       region
26 5              Sor-Trondelag                       region
27 6              Trondheim+Kommune                  county
28 7              Trondheim+Kommune                  county
29 8              Trondheim+Kommune                  county
30 9              Trondheim                          locality
31 10             Trondheim                          locality
32 11             Trondheim                          locality
33 12             Marinen                             neighbourhood
34 13             Marinen                             neighbourhood
35 14             Marinen                             neighbourhood
36 15             Marinen                             neighbourhood
37 16             Marinen                             neighbourhood
38
```

```

39 Filename: 03_ishavskatedralen.jpg
40 Accuracy:      Name:
41 1              Norway                country
42 2              Norway                country
43 3              Troms+Fylke           region
44 4              Troms+Fylke           region
45 5              Troms+Fylke           region
46 6              Troms%F8+Kommune      county
47 7              Troms%F8+Kommune      county
48 8              Troms%F8+Kommune      county
49 9              Tromsdalen            locality
50 10             Tromsdalen            locality
51 11             Tromsdalen            locality
52 12             Tromsdalen            locality
53 13             Tromsdalen            locality
54 14             Tromsdalen            locality
55 15             Tromsdalen            locality
56 16             Tromsdalen            locality
57
58 Filename: 04_ulm_minster.jpg
59 Accuracy:      Name:
60 1              Germany              country
61 2              Germany              country
62 3              Baden-Wurttemberg    region
63 4              Baden-Wurttemberg    region
64 5              Baden-Wurttemberg    region
65 6              Stadtkreis+Ulm       county
66 7              Stadtkreis+Ulm       county
67 8              Stadtkreis+Ulm       county
68 9              Ulm                  locality
69 10             Ulm                  locality
70 11             Ulm                  locality
71 12             Ulm                  locality
72 13             Ulm                  locality
73 14             Ulm                  locality
74 15             Ulm                  locality
75 16             Ulm                  locality
76
77 Filename: 05_westminster_abbey.jpg
78 Accuracy:      Name:
79 1              United+Kingdom        country
80 2              United+Kingdom        country
81 3              England              region
82 4              England              region
83 5              England              region
84 6              Greater+London        county
85 7              Greater+London        county
86 8              Greater+London        county
87 9              London                locality
88 10             London                locality
89 11             London                locality
90 12             Westminster           neighbourhood
91 13             Westminster           neighbourhood
92 14             Westminster           neighbourhood
93 15             Westminster           neighbourhood
94 16             Westminster           neighbourhood
95
96 Filename: 06_golden_gate_bridge.jpg
97 Accuracy:      Name:
98 1              United+States         country
99 2              United+States         country
100 3             California            region

```

101	4	California	region
102	5	California	region
103	6	San+Francisco+County	county
104	7	San+Francisco+County	county
105	8	San+Francisco+County	county
106	9	Belvedere	locality
107	10	Belvedere	locality
108	11	Belvedere	locality
109	12	Fort+Winfield+Scott	neighbourhood
110	13	Fort+Winfield+Scott	neighbourhood
111	14	Fort+Winfield+Scott	neighbourhood
112	15	Fort+Winfield+Scott	neighbourhood
113	16	Fort+Winfield+Scott	neighbourhood
114			
115	Filename: 07_washington_monument.jpg		
116	Accuracy:	Name:	Type:
117	1	United+States	country
118	2	United+States	country
119	3	District+of+Columbia	region
120	4	District+of+Columbia	region
121	5	District+of+Columbia	region
122	6	Arlington+County	county
123	7	Arlington+County	county
124	8	Arlington+County	county
125	9	Washington	locality
126	10	Washington	locality
127	11	Washington	locality
128	12	Monumental+Core	neighbourhood
129	13	Monumental+Core	neighbourhood
130	14	Monumental+Core	neighbourhood
131	15	Monumental+Core	neighbourhood
132	16	Monumental+Core	neighbourhood
133			
134	Filename: 08_colosseum.jpg		
135	Accuracy:	Name:	Type:
136	1	Italy	country
137	2	Italy	country
138	3	Lazio	region
139	4	Lazio	region
140	5	Lazio	region
141	6	Rome	county
142	7	Rome	county
143	8	Rome	county
144	9	Rome	locality
145	10	Rome	locality
146	11	Rome	locality
147	12	San+Paolo	neighbourhood
148	13	San+Paolo	neighbourhood
149	14	San+Paolo	neighbourhood
150	15	San+Paolo	neighbourhood
151	16	San+Paolo	neighbourhood
152			
153	Filename: 09_leaning_tower_of_pisa.jpg		
154	Accuracy:	Name:	Type:
155	1	Italy	country
156	2	Italy	country
157	3	Tuscany	region
158	4	Tuscany	region
159	5	Tuscany	region
160	6	Pisa	county
161	7	Pisa	county
162	8	Pisa	county

163	9	Pisa	locality
164	10	Pisa	locality
165	11	Pisa	locality
166	12	Pisa+Airport	locality
167	13	Pisa+Airport	locality
168	14	Pisa+Airport	locality
169	15	Pisa+Airport	locality
170	16	Pisa+Airport	locality
171			
172	Filename: 10_eiffel_tower.jpg		
173	Accuracy:	Name:	Type:
174	1	France	country
175	2	France	country
176	3	Ile-de-France	region
177	4	Ile-de-France	region
178	5	Ile-de-France	region
179	6	Paris	county
180	7	Paris	county
181	8	Paris	county
182	9	Paris+7e+Arrondissement	locality
183	10	Paris+7e+Arrondissement	locality
184	11	Paris+7e+Arrondissement	locality
185	12	Gros+Caillou	neighbourhood
186	13	Gros+Caillou	neighbourhood
187	14	Gros+Caillou	neighbourhood
188	15	Gros+Caillou	neighbourhood
189	16	Gros+Caillou	neighbourhood
190			
191	Filename: 11_dubai_burj_al_arab.jpg		
192	Accuracy:	Name:	Type:
193	1	United+Arab+Emirates	country
194	2	United+Arab+Emirates	country
195	3	Dubai	region
196	4	Dubai	region
197	5	Dubai	region
198	6	Dubai	county
199	7	Dubai	county
200	8	Dubai	county
201	9	Dubai	locality
202	10	Dubai	locality
203	11	Dubai	locality
204	12	Umm+Suqeim+3	neighbourhood
205	13	Umm+Suqeim+3	neighbourhood
206	14	Umm+Suqeim+3	neighbourhood
207	15	Umm+Suqeim+3	neighbourhood
208	16	Umm+Suqeim+3	neighbourhood
209			
210	Filename: 12_ice_hotel_jukkasjarvi.jpg		
211	Accuracy:	Name:	Type:
212	1	Sweden	country
213	2	Sweden	country
214	3	Norrbottn	region
215	4	Norrbottn	region
216	5	Norrbottn	region
217	6	Kiruna	county
218	7	Kiruna	county
219	8	Kiruna	county
220	9	Jukkasj%E4rvi	locality
221	10	Jukkasj%E4rvi	locality
222	11	Jukkasj%E4rvi	locality
223	12	Jukkasj%E4rvi	locality
224	13	Jukkasj%E4rvi	locality

225	14	Jukkasj%E4rvi	locality
226	15	Jukkasj%E4rvi	locality
227	16	Jukkasj%E4rvi	locality
228			
229	Filename: 13_kheops_pyramid.jpg		
230	Accuracy:	Name:	Type:
231	1	Egypt	country
232	2	Egypt	country
233	3	Al+Jizah	region
234	4	Al+Jizah	region
235	5	Al+Jizah	region
236	6	Al+Jizah	region
237	7	Al+Jizah	region
238	8	Al+Jizah	region
239	9	Nazlat+as+Samman	locality
240	10	Nazlat+as+Samman	locality
241	11	Nazlat+as+Samman	locality
242	12	Nazlat+as+Samman	locality
243	13	Nazlat+as+Samman	locality
244	14	Nazlat+as+Samman	locality
245	15	Nazlat+as+Samman	locality
246	16	Nazlat+as+Samman	locality
247			
248	Filename: 14_brandenburger_tor.jpg		
249	Accuracy:	Name:	Type:
250	1	Germany	country
251	2	Germany	country
252	3	Berlin	region
253	4	Berlin	region
254	5	Berlin	region
255	6	Stadtkreis+Berlin	county
256	7	Stadtkreis+Berlin	county
257	8	Stadtkreis+Berlin	county
258	9	Berlin	locality
259	10	Berlin	locality
260	11	Berlin	locality
261	12	Moabit	neighbourhood
262	13	Moabit	neighbourhood
263	14	Moabit	neighbourhood
264	15	Moabit	neighbourhood
265	16	Moabit	neighbourhood
266			
267	Filename: 15_bagrations_bridge.jpg		
268	Accuracy:	Name:	Type:
269	1	Krasnaya+Presnya	neighbourhood
270	2	Krasnaya+Presnya	neighbourhood
271	3	Moskva	region
272	4	Moskva	region
273	5	Moskva	region
274	6	Moscow	county
275	7	Moscow	county
276	8	Moscow	county
277	9	Moscow	locality
278	10	Moscow	locality
279	11	Moscow	locality
280	12	Krasnaya+Presnya	neighbourhood
281	13	Krasnaya+Presnya	neighbourhood
282	14	Krasnaya+Presnya	neighbourhood
283	15	Krasnaya+Presnya	neighbourhood
284	16	Krasnaya+Presnya	neighbourhood
285			
286	Filename: 16_north_shore_surfing.jpg		

287	Accuracy:	Name:	Type:
288	1	United+States	country
289	2	United+States	country
290	3	Hawaii	region
291	4	Hawaii	region
292	5	Hawaii	region
293	6	Honolulu+County	county
294	7	Honolulu+County	county
295	8	Honolulu+County	county
296	9	Haleiwa	locality
297	10	Haleiwa	locality
298	11	Haleiwa	locality
299	12	Waimea	neighbourhood
300	13	Waimea	neighbourhood
301	14	Waimea	neighbourhood
302	15	Waimea	neighbourhood
303	16	Waimea	neighbourhood
304			
305	Filename: 17_tahiti.jpg		
306	Accuracy:	Name:	Type:
307	1	French+Polynesia	country
308	2	French+Polynesia	country
309	3	Windward+Islands	region
310	4	Windward+Islands	region
311	5	Windward+Islands	region
312	6	Taiarapu-Est	county
313	7	Taiarapu-Est	county
314	8	Taiarapu-Est	county
315	9	Taiarapu-Est	county
316	10	Taiarapu-Est	county
317	11	Taiarapu-Est	county
318	12	Taiarapu-Est	county
319	13	Taiarapu-Est	county
320	14	Taiarapu-Est	county
321	15	Taiarapu-Est	county
322	16	Taiarapu-Est	county
323			
324	Filename: 18_hersonissos_crete.jpg		
325	Accuracy:	Name:	Type:
326	1	Greece	country
327	2	Greece	country
328	3	Kriti	region
329	4	Kriti	region
330	5	Kriti	region
331	6	Iraklio	county
332	7	Iraklio	county
333	8	Iraklio	county
334	9	Limenas+Chersonisou	locality
335	10	Limenas+Chersonisou	locality
336	11	Limenas+Chersonisou	locality
337	12	Limenas+Chersonisou	locality
338	13	Limenas+Chersonisou	locality
339	14	Limenas+Chersonisou	locality
340	15	Limenas+Chersonisou	locality
341	16	Limenas+Chersonisou	locality
342			
343	Filename: 19_polar_zoo.jpg		
344	Accuracy:	Name:	Type:
345	1	Norway	country
346	2	Norway	country
347	3	Troms+Fylke	region
348	4	Troms+Fylke	region

349	5	Troms+Fylke	region
350	6	Bardu+Kommune	county
351	7	Bardu+Kommune	county
352	8	Bardu+Kommune	county
353	9	Fossbakken	locality
354	10	Fossbakken	locality
355	11	Fossbakken	locality
356	12	Fossbakken	locality
357	13	Fossbakken	locality
358	14	Fossbakken	locality
359	15	Fossbakken	locality
360	16	Fossbakken	locality
361			
362	Filename: 21_manchester_united_vs_sunderland.jpg		
363	Accuracy:	Name:	Type:
364	1	United+Kingdom	country
365	2	United+Kingdom	country
366	3	England	region
367	4	England	region
368	5	England	region
369	6	Greater+Manchester	county
370	7	Greater+Manchester	county
371	8	Greater+Manchester	county
372	9	Manchester	locality
373	10	Manchester	locality
374	11	Manchester	locality
375	12	Gorse+Hill	neighbourhood
376	13	Gorse+Hill	neighbourhood
377	14	Gorse+Hill	neighbourhood
378	15	Gorse+Hill	neighbourhood
379	16	Gorse+Hill	neighbourhood
380			
381	Filename: 22_manchester_united_vs_aalborg.jpg		
382	Accuracy:	Name:	Type:
383	1	United+Kingdom	country
384	2	United+Kingdom	country
385	3	England	region
386	4	England	region
387	5	England	region
388	6	Greater+Manchester	county
389	7	Greater+Manchester	county
390	8	Greater+Manchester	county
391	9	Manchester	locality
392	10	Manchester	locality
393	11	Manchester	locality
394	12	Gorse+Hill	neighbourhood
395	13	Gorse+Hill	neighbourhood
396	14	Gorse+Hill	neighbourhood
397	15	Gorse+Hill	neighbourhood
398	16	Gorse+Hill	neighbourhood
399			
400	Filename: 24_copenhagen_nordjylland.jpg		
401	Accuracy:	Name:	Type:
402	1	Denmark	country
403	2	Denmark	country
404	3	Hovedstaden	region
405	4	Hovedstaden	region
406	5	Hovedstaden	region
407	6	Copenhagen	county
408	7	Copenhagen	county
409	8	Copenhagen	county
410	9	Copenhagen	locality

411	10	Copenhagen	locality
412	11	Copenhagen	locality
413	12	Indre+Osterbro	neighbourhood
414	13	Indre+Osterbro	neighbourhood
415	14	Indre+Osterbro	neighbourhood
416	15	Indre+Osterbro	neighbourhood
417	16	Indre+Osterbro	neighbourhood
418			
419	Filename: 25_vif_lfc.jpg		
420	Accuracy:	Name:	Type:
421	1	Norway	country
422	2	Norway	country
423	3	Oslo+Fylke	region
424	4	Oslo+Fylke	region
425	5	Oslo+Fylke	region
426	6	Oslo	county
427	7	Oslo	county
428	8	Oslo	county
429	9	Oslo	locality
430	10	Oslo	locality
431	11	Oslo	locality
432	12	Sogn	neighbourhood
433	13	Sogn	neighbourhood
434	14	Sogn	neighbourhood
435	15	Sogn	neighbourhood
436	16	Sogn	neighbourhood
437			
438	Filename: 26_dognvill_festival.jpg		
439	Accuracy:	Name:	Type:
440	1	Norway	country
441	2	Norway	country
442	3	Troms+Fylke	region
443	4	Troms+Fylke	region
444	5	Troms+Fylke	region
445	6	Troms%F8+Kommune	county
446	7	Troms%F8+Kommune	county
447	8	Troms%F8+Kommune	county
448	9	Tromso	locality
449	10	Tromso	locality
450	11	Tromso	locality
451	12	Tromso	locality
452	13	Tromso	locality
453	14	Tromso	locality
454	15	Tromso	locality
455	16	Tromso	locality
456			
457	Filename: 27_u2_valle_hovin.jpg		
458	Accuracy:	Name:	Type:
459	1	Norway	country
460	2	Norway	country
461	3	Oslo+Fylke	region
462	4	Oslo+Fylke	region
463	5	Oslo+Fylke	region
464	6	Oslo	county
465	7	Oslo	county
466	8	Oslo	county
467	9	Oslo	locality
468	10	Oslo	locality
469	11	Oslo	locality
470	12	Helsfyr-sinsen	neighbourhood
471	13	Helsfyr-sinsen	neighbourhood
472	14	Helsfyr-sinsen	neighbourhood

473	15	Helsfyr-sinsen	neighbourhood
474	16	Helsfyr-sinsen	neighbourhood
475			
476		Filename: 28_muse_stockholm.jpg	
477	Accuracy:	Name:	Type:
478	1	Sweden	country
479	2	Sweden	country
480	3	Stockholm	region
481	4	Stockholm	region
482	5	Stockholm	region
483	6	Stockholm+Kommun	county
484	7	Stockholm+Kommun	county
485	8	Stockholm+Kommun	county
486	9	Gubb%E4ngen	locality
487	10	Gubb%E4ngen	locality
488	11	Gubb%E4ngen	locality
489	12	Johanneshov	neighbourhood
490	13	Johanneshov	neighbourhood
491	14	Johanneshov	neighbourhood
492	15	Johanneshov	neighbourhood
493	16	Johanneshov	neighbourhood
494			
495		Filename: 29_u2_barcelona.jpg	
496	Accuracy:	Name:	Type:
497	1	Spain	country
498	2	Spain	country
499	3	Catalonia	region
500	4	Catalonia	region
501	5	Catalonia	region
502	6	Barcelona	county
503	7	Barcelona	county
504	8	Barcelona	county
505	9	I%27Hospitalet+de+Llobregat	locality
506	10	I%27Hospitalet+de+Llobregat	locality
507	11	I%27Hospitalet+de+Llobregat	locality
508	12	Diagonal	neighbourhood
509	13	Diagonal	neighbourhood
510	14	Diagonal	neighbourhood
511	15	Diagonal	neighbourhood
512	16	Diagonal	neighbourhood
513			
514		Filename: 30_bruce_springsteen_los_angeles.jpg	
515	Accuracy:	Name:	Type:
516	1	United+States	country
517	2	United+States	country
518	3	California	region
519	4	California	region
520	5	California	region
521	6	Los+Angeles+County	county
522	7	Los+Angeles+County	county
523	8	Los+Angeles+County	county
524	9	Los+Angeles	locality
525	10	Los+Angeles	locality
526	11	Los+Angeles	locality
527	12	Green	neighbourhood
528	13	Green	neighbourhood
529	14	Green	neighbourhood
530	15	Green	neighbourhood
531	16	Green	neighbourhood

C.2 Context results for images

ID : 1
 Filename: 01_notre_dame.jpg
 Date : 15.06.2008 12:08:17
 Category: Church
 Location: Paris 4e Arrondissement
 Country : France
 Temp : 16.0
 ICAO : LFPG
 Tags: paris, france, notredame, church, cathedral, geotagged,

Wikiarticles:

Title : Notre Dame de Paris
 Distance : 0.037
 Value : 8

Title : Notre Dame
 Distance : 0.0739
 Value : 6

Title : Kilometre Zero
 Distance : 0.0781
 Value : 2

Title : Pont au Double
 Distance : 0.1189
 Value : 0

Title : Hôtel-Dieu de Paris
 Distance : 0.1884
 Value : 1

Search articles:

Title : LiÃpvre
 Source : wikipedia
 Cat_value: 89
 Loc_value: 0

Title : Inaccuracies in The Da Vinci Code
 Source : wikipedia
 Cat_value: 42
 Loc_value: 0

Title : Åglise Saint-Sulpice, Paris
 Source : wikipedia
 Cat_value: 37
 Loc_value: 0

Title : Saint-Julien-le-Pauvre
 Source : wikipedia
 Cat_value: 18
 Loc_value: 0

Title : Saint-Vincent-de-Paul church, Paris
 Source : wikipedia
 Cat_value: 18
 Loc_value: 0

Title : Churches of Paris - Paris Churches
 Source : google
 Cat_value: 15
 Loc_value: 0

Title : Churches of Paris - Paris Churches
 Source : yahoo
 Cat_value: 15
 Loc_value: 0

Title : St-Gervais-et-St-Protais Church
 Source : wikipedia
 Cat_value: 14
 Loc_value: 0

Title : Åglise Saint-Eustache, Paris
 Source : wikipedia
 Cat_value: 12
 Loc_value: 0

Title : Notre Dame de Paris
 Source : wikipedia
 Cat_value: 8
 Loc_value: 0

Title : 5th arrondissement of Paris
 Source : wikipedia
 Cat_value: 8
 Loc_value: 0

Title : Saint-Jacques Tower
 Source : wikipedia

Cat_value: 8
 Loc_value: 0

Title : [Paris sur Web, Toute lâ€™information, les lieux et les secrets de ...
 Source : bing
 Cat_value: 7
 Loc_value: 0

Title : Jean-Marie Lustiger
 Source : wikipedia
 Cat_value: 7
 Loc_value: 0

Title : L'IndÃ©pendant du 4e Arrondissement de Paris: CCCLII : Petition to ...
 Source : bing
 Cat_value: 6
 Loc_value: 0

Title : L'IndÃ©pendant du 4e Arrondissement de Paris: Patrimoine
 Source : yahoo
 Cat_value: 4
 Loc_value: 0

Title : L'IndÃ©pendant du 4e Arrondissement de Paris: Patrimoine i
 Source : bing
 Cat_value: 4
 Loc_value: 0

Title : HÃ´tel de Ville, Paris
 Source : wikipedia
 Cat_value: 4
 Loc_value: 0

Title : 4th arrondissement of Paris - Wikipedia, the free encyclopedia
 Source : google
 Cat_value: 3
 Loc_value: 0

Title : 4th arrondissement travel guide - Wikitravel
 Source : google
 Cat_value: 3
 Loc_value: 0

Title : StateMaster - Encyclopedia: VIIe arrondissement
 Source : google
 Cat_value: 3
 Loc_value: 0

Title : Paris Vacation Apartments - Americans in France
 Source : google
 Cat_value: 3
 Loc_value: 0

Title : 4th arrondissement travel guide - Wikitravel
 Source : yahoo
 Cat_value: 3
 Loc_value: 0

Title : Paris Vacation Apartments - Americans in France
 Source : yahoo
 Cat_value: 3
 Loc_value: 0

Title : Paris quatriÃ¨me - 4th district of Paris
 Source : yahoo
 Cat_value: 3
 Loc_value: 0

Title : 4th arrondissement of Paris - Wikipedia, the free encyclopedia
 Source : bing
 Cat_value: 3
 Loc_value: 0

Title : Paris Vacation Apartments - Americans in France
 Source : bing
 Cat_value: 3
 Loc_value: 0

Title : Paris (France) -- Britannica Online Encyclopedia
 Source : bing
 Cat_value: 3
 Loc_value: 0

Title : 4th arrondissement of Paris
 Source : wikipedia
 Cat_value: 3
 Loc_value: 0

Title : Ain
 Source : wikipedia

Cat_value: 3
Loc_value: 0

Title : Sainte-Chapelle
Source : wikipedia
Cat_value: 3
Loc_value: 0

Title : Fountains in Paris
Source : wikipedia
Cat_value: 3
Loc_value: 0

Title : Paris Tourist Attractions: Sightseeing and Attractions in Paris ...
Source : google
Cat_value: 2
Loc_value: 0

Title : Paris, France Arrondissement
Source : google
Cat_value: 1
Loc_value: 0

Title : Paris 4e center! on Flickr - Photo Sharing!
Source : google
Cat_value: 1
Loc_value: 0

Title : Arrondissements (sections of Paris) - Paris Travel Guide ...
Source : google
Cat_value: 1
Loc_value: 0

Title : Photos & Video taken in Paris on Flickr!
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : Paris 4e center! on Flickr - Photo Sharing!
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : 2e arrondissement Hotels Paris - Accommodation in Paris Arrondissement ...
Source : bing
Cat_value: 1
Loc_value: 0

Title : White_RosesnParis's "~ * Must SEE PARIS Sights * ~" on Lists of Bests
Source : bing
Cat_value: 1
Loc_value: 0

Title : Paris
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Clifford Borg
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Panthéon, Paris
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Paris Balades arrondissement 4
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : 4e Arrondissement (Hôtel-de-Ville) - Community in 4e Arrondissement ...
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : L'Indépendant du 4e Arrondissement de Paris
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : GeoNames Fulltextsearch : paris
Source : bing
Cat_value: 0
Loc_value: 0

Title : cadres 4 english
Source : bing

Cat_value: 0
Loc_value: 0

Title : RÅ@union
Source : wikipedia
Cat_value: 0
Loc_value: 0

Title : Paris Hotel - Réservation des hôtels de luxe Dans le 1 éme ...
Source : google
Cat_value: -1
Loc_value: -1

ID : 2
Filename: 02_nidarosdomen.jpg
Date : 24.07.2008 12:08:17
Category: Church
Location: Trondheim
Country : Norway
Temp : 21.0
ICAO : ENVA
Tags: trondheim, norway, norge, 2009, nidarosdomen, noorwegen,

Wikiarticles:
Title : Nidaros Cathedral
Distance : 0.0967
Value : 3

Title : Old Town Bridge
Distance : 0.3258
Value : 0

Title : Trampe bicycle lift
Distance : 0.4228
Value : 0

Title : Norwegian University of Science and Technology
Distance : 0.8956
Value : 0

Search articles:
Title : Trondheim Free-Church
Source : yahoo
Cat_value: 20
Loc_value: 7

Title : Church of Norway
Source : google
Cat_value: 19
Loc_value: 9

Title : Heimaey stave church
Source : wikipedia
Cat_value: 19
Loc_value: 1

Title : Norway
Source : wikipedia
Cat_value: 18
Loc_value: 7

Title : Roman Catholicism in Norway
Source : wikipedia
Cat_value: 16
Loc_value: 3

Title : Trondheim Municipality in Norway
Source : yahoo
Cat_value: 14
Loc_value: 39

Title : Bernt Julius Muus
Source : wikipedia
Cat_value: 14
Loc_value: 2

Title : The Pipe Organ at Our Lady Church, Trondheim, Norway
Source : google
Cat_value: 13
Loc_value: 3

Title : The organ at Ilen church, Trondheim
Source : yahoo
Cat_value: 13
Loc_value: 10

Title : A Walking Tour: Visiting Trondheim, Norway

Source : google
Cat_value: 12
Loc_value: 6

Title : Haltdalen stave church
Source : wikipedia
Cat_value: 12
Loc_value: 1

Title : FlÅan church
Source : wikipedia
Cat_value: 10
Loc_value: 1

Title : Trondheim Anglicans - home page
Source : google
Cat_value: 9
Loc_value: 5

Title : Trondheim Anglicans - home page
Source : yahoo
Cat_value: 9
Loc_value: 5

Title : Lade Church
Source : wikipedia
Cat_value: 9
Loc_value: 1

Title : Nidaros
Source : wikipedia
Cat_value: 8
Loc_value: 7

Title : Church City Mission
Source : wikipedia
Cat_value: 8
Loc_value: 1

Title : Our Lady's Church, Churches and monasteries, Trondheim Norway Directory
Source : yahoo
Cat_value: 6
Loc_value: 3

Title : Norway Directory t
Source : bing
Cat_value: 6
Loc_value: 18

Title : Roman Catholic Territorial Prelature of Trondheim
Source : wikipedia
Cat_value: 6
Loc_value: 11

Title : Battle of Stiklestad
Source : wikipedia
Cat_value: 6
Loc_value: 4

Title : Byåsen menighet
Source : yahoo
Cat_value: 5
Loc_value: 5

Title : St. Olav Catholic Church - Norway official travel guide - visitnorway.com
Source : yahoo
Cat_value: 5
Loc_value: 16

Title : St. Olaf's church
Source : wikipedia
Cat_value: 4
Loc_value: 1

Title : Nidaros Cathedral - Wikipedia, the free encyclopedia
Source : google
Cat_value: 3
Loc_value: 4

Title : St. Olav Catholic Church - Norway official travel guide ...
Source : google
Cat_value: 3
Loc_value: 15

Title : Church of Our Lady, Trondheim
Source : google
Cat_value: 3
Loc_value: 17

Title : Trondheim Free-Church

Source : yahoo
Cat_value: 3
Loc_value: 2

Title : Trondheim - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 3
Loc_value: 128

Title : Norway Directory s
Source : bing
Cat_value: 3
Loc_value: 5

Title : Nidaros Cathedral
Source : wikipedia
Cat_value: 3
Loc_value: 4

Title : Diocese of Nidaros
Source : wikipedia
Cat_value: 3
Loc_value: 5

Title : Trondheim
Source : wikipedia
Cat_value: 3
Loc_value: 128

Title : Haltdalen
Source : wikipedia
Cat_value: 3
Loc_value: 1

Title : Olaf I of Norway
Source : wikipedia
Cat_value: 2
Loc_value: 3

Title : Frosta
Source : wikipedia
Cat_value: 2
Loc_value: 2

Title : NTNU Museum of Natural History and Archaeology
Source : wikipedia
Cat_value: 2
Loc_value: 4

Title : Vår Frue Kirke (Our Lady's Church) in Trondheim, Norway
Source : google
Cat_value: 1
Loc_value: 7

Title : Nidaros Cathedral (church, Trondheim, Norway) -- Britannica Online ...
Source : google
Cat_value: 1
Loc_value: 5

Title : Zia Teresa, Italiensk, Trondheim Norway Directory
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : Zia Teresa, Italiensk, Trondheim Norway Directory
Source : bing
Cat_value: 1
Loc_value: 1

Title : Trondheim Å« Norway.com
Source : bing
Cat_value: 1
Loc_value: 22

Title : Trondheim - the official website - Pilgrim ways in Norway
Source : bing
Cat_value: 1
Loc_value: 7

Title : VÅr Frue Kirke (Our Lady's Church) in Trondheim, Norway
Source : bing
Cat_value: 1
Loc_value: 7

Title : Trondheim, Norway definition of Trondheim, Norway in the Free Online ...
Source : bing
Cat_value: 1
Loc_value: 22

Title : Flag of Trondheim

Source : wikipedia
 Cat_value: 1
 Loc_value: 14

Title : Den katolske kirke i Norge
 Source : yahoo
 Cat_value: 0
 Loc_value: 0

Title : Den katolske kirke
 Source : bing
 Cat_value: 0
 Loc_value: 0

Title : Welcome to St. Edmund's Anglican Church, Oslo, Norway
 Source : google
 Cat_value: -1
 Loc_value: -1

Title : Topic details ('Norway, SÅ,r-TrÅ,ndelag, Trondheim - Church records ...
 Source : bing
 Cat_value: -1
 Loc_value: -1

 ID : 3
 Filename: 03_ishavskatedralen.jpg
 Date : 15.09.2007 10:31:17
 Category: Church
 Location: Tromsdalen
 Country : Norway
 Temp : 8.0
 ICAO : ENTC
 Tags: norway, norwegen, tromsÅ., eismeerkathedrale, church, kirche,

Wikiarticles:
 Title : Arctic Cathedral
 Distance : 0.0335
 Value : 11

Title : Tromsø Bridge
 Distance : 0.5037
 Value : 0

Search articles:
 Title : SCHEDULE - Ragnar Rasmussen :: conductor and musician,Choral ...
 Source : google
 Cat_value: 38
 Loc_value: 4

Title : Ragnar Rasmussen :: conductor and musician,Choral Conductor Norway ...
 Source : yahoo
 Cat_value: 38
 Loc_value: 4

Title : The Arctic Cathedral (Tromsdalen Church)
 Source : google
 Cat_value: 16
 Loc_value: 7

Title : The Arctic Cathedral (Tromsdalen Church)
 Source : yahoo
 Cat_value: 16
 Loc_value: 7

Title : The Arctic Cathedral (Tromsdalen Church)
 Source : bing
 Cat_value: 16
 Loc_value: 7

Title : TromsÅ.
 Source : wikipedia
 Cat_value: 12
 Loc_value: 2

Title : Arctic Cathedral - Wikipedia, the free encyclopedia
 Source : yahoo
 Cat_value: 11
 Loc_value: 2

Title : Arctic Cathedral
 Source : wikipedia
 Cat_value: 11
 Loc_value: 2

Title : Church of Norway
 Source : google
 Cat_value: 8

Loc_value: 1

Title : Church of Norway
Source : yahoo
Cat_value: 8
Loc_value: 1

Title : Church of Norway
Source : bing
Cat_value: 8
Loc_value: 1

Title : Norway Directory t
Source : yahoo
Cat_value: 6
Loc_value: 1

Title : Norway Directory t
Source : bing
Cat_value: 6
Loc_value: 1

Title : Tromsø Bridge: Facts, Discussion Forum, and Encyclopedia Article
Source : google
Cat_value: 5
Loc_value: 5

Title : NORWAY 1981 Maximum Card - Tromsdalen Church on eBay (end time 07 ...
Source : google
Cat_value: 4
Loc_value: 6

Title : YAY Micro | Image of Tromsdalen Church
Source : google
Cat_value: 4
Loc_value: 1

Title : Tromsdalen, Arctic Cathedral, Storsteinen (421m) and Floya (671m ...
Source : google
Cat_value: 4
Loc_value: 7

Title : World Environment Ecumenical Ceremony at The Arctic Cathedral ...
Source : bing
Cat_value: 4
Loc_value: 1

Title : TROMSDALEN - Tromsø
Source : google
Cat_value: 3
Loc_value: 1

Title : Contact details - TromsÅ.ysund menighet - Tips en venn
Source : bing
Cat_value: 3
Loc_value: 3

Title : Weather forecast for Tromsdalen in Tromsø (Troms) yr.no
Source : yahoo
Cat_value: 2
Loc_value: 11

Title : Norway Directory v
Source : yahoo
Cat_value: 2
Loc_value: 0

Title : Football match: Sogndal-T.U.I.L.Tromsdalen - Norway official travel ...
Source : yahoo
Cat_value: 2
Loc_value: 2

Title : Weather forecast for Tromsøysund in Tromsø (Troms) yr.no
Source : yahoo
Cat_value: 2
Loc_value: 1

Title : Norway Directory v
Source : bing
Cat_value: 2
Loc_value: 0

Title : Arctic Cathedral (Tromsdalen Kirke) - Tromso, Norway, Norway ...
Source : google
Cat_value: 1
Loc_value: 1

Title : Norway Directory e
Source : yahoo
Cat_value: 1

Loc_value: 0

Title : Norway Directory r
Source : bing
Cat_value: 1
Loc_value: 0

Title : Grant Stoddard mission pictures
Source : bing
Cat_value: 1
Loc_value: 1

Title : kvasir.no
Source : bing
Cat_value: 0
Loc_value: 0

Title : Norway Directory b
Source : bing
Cat_value: 0
Loc_value: 0

Title : Ten Sing
Source : wikipedia
Cat_value: 0
Loc_value: 1

Title : • Tromsø Alfred Hansens Veg • Norway • Eismeer- Kathedrale Tromsö ...
Source : google
Cat_value: -1
Loc_value: -1

ID : 4
Filename: 04_ulm_minster.jpg
Date : 15.08.2008 10:31:17
Category: Church
Location: Ulm
Country : Germany
Temp : 13.0
ICAO : ETHEL
Tags: ulm, germany, europe, mÃ¼nster, church, geotagged,

Wikiarticles:
Title : Ulm Cathedral
Distance : 0.0001
Value : 19

Title : Ulm Hauptbahnhof
Distance : 0.6941
Value : 0

Search articles:
Title : List of tallest churches in the world
Source : wikipedia
Cat_value: 79
Loc_value: 2

Title : Mid-South District (LCMS)
Source : wikipedia
Cat_value: 35
Loc_value: 1

Title : Ulm Minster - Wikipedia, the free encyclopedia
Source : google
Cat_value: 19
Loc_value: 23

Title : Ulm Minster - Wikipedia, the free encyclopedia
Source : yahoo
Cat_value: 19
Loc_value: 24

Title : Ulm Minster - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 19
Loc_value: 24

Title : Ulm Minster
Source : wikipedia
Cat_value: 19
Loc_value: 23

Title : Ulm Cathedral
Source : google
Cat_value: 18
Loc_value: 14

Title : Ulm Cathedral
Source : yahoo
Cat_value: 18
Loc_value: 14

Title : Wiblingen Abbey
Source : wikipedia
Cat_value: 17
Loc_value: 9

Title : Ulm Minster
Source : google
Cat_value: 14
Loc_value: 14

Title : Cologne Cathedral
Source : wikipedia
Cat_value: 12
Loc_value: 4

Title : Roggenburg Abbey
Source : wikipedia
Cat_value: 11
Loc_value: 3

Title : Ulm: Definition from Answers.com
Source : yahoo
Cat_value: 8
Loc_value: 137

Title : John Clayton Nienstedt
Source : wikipedia
Cat_value: 7
Loc_value: 11

Title : Brick Expressionism
Source : wikipedia
Cat_value: 7
Loc_value: 1

Title : Ulm - Wikipedia, the free encyclopedia
Source : google
Cat_value: 6
Loc_value: 107

Title : Ulm - Wikipedia, the free encyclopedia
Source : yahoo
Cat_value: 6
Loc_value: 107

Title : Ulm - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 6
Loc_value: 107

Title : Ulm
Source : wikipedia
Cat_value: 6
Loc_value: 107

Title : Chicago Temple Building
Source : wikipedia
Cat_value: 6
Loc_value: 1

Title : SÄ¶flingen Abbey
Source : wikipedia
Cat_value: 6
Loc_value: 27

Title : Ulm M¼nster - Ulm, Germany
Source : google
Cat_value: 5
Loc_value: 17

Title : Ulm M¼nster - Ulm, Germany
Source : yahoo
Cat_value: 5
Loc_value: 17

Title : Ulm MÄnster - Ulm, Germany
Source : bing
Cat_value: 5
Loc_value: 17

Title : St Pauls Church Photo. Ulm - Germany travel photography.
Source : bing
Cat_value: 5
Loc_value: 4

Title : Destination Germany - Places of Interest - Ulm - Ulm Münster
Source : google
Cat_value: 4
Loc_value: 13

Title : World's tallest church in Ulm, Germany
Source : google
Cat_value: 4
Loc_value: 7

Title : The World's highest Church Spire and the Sparrows - Ulm, Germany ...
Source : google
Cat_value: 4
Loc_value: 42

Title : Muenster Church, Ulm
Source : google
Cat_value: 4
Loc_value: 15

Title : St. George's Collegiate Church, TÄbingen
Source : wikipedia
Cat_value: 4
Loc_value: 1

Title : Peregrine Gobelin - Travel (Ulm, Germany)
Source : yahoo
Cat_value: 3
Loc_value: 6

Title : Peregrine Gobelin - Travel (Ulm, Germany)
Source : bing
Cat_value: 3
Loc_value: 6

Title : John M. LeVoir
Source : wikipedia
Cat_value: 3
Loc_value: 6

Title : Martin Luther College
Source : wikipedia
Cat_value: 3
Loc_value: 6

Title : Ulm Cathedral Panorama
Source : yahoo
Cat_value: 2
Loc_value: 3

Title : Ulm, Germany definition of Ulm, Germany in the Free Online ...
Source : bing
Cat_value: 2
Loc_value: 19

Title : Ulm Tourist Information | Practical information, hotels and tourism ...
Source : bing
Cat_value: 2
Loc_value: 10

Title : Swabian Alb
Source : wikipedia
Cat_value: 2
Loc_value: 3

Title : New Ulm, Minnesota
Source : wikipedia
Cat_value: 2
Loc_value: 64

Title : Sebastian Anton Scherer
Source : wikipedia
Cat_value: 2
Loc_value: 7

Title : Suspense in Ulm - EKD: Evangelical Church in Germany
Source : google
Cat_value: 1
Loc_value: 5

Title : Jobs at Intel - Germany, Ulm
Source : yahoo
Cat_value: 1
Loc_value: 7

Title : Germany, Ulm, Church Carving
Source : bing
Cat_value: 1
Loc_value: 1

Title : Jobs at Intel - Germany, Ulm
 Source : bing
 Cat_value: 1
 Loc_value: 7

Title : Catholic High School (New Ulm, Minnesota)
 Source : wikipedia
 Cat_value: 1
 Loc_value: 2

Title : Ulrich Ensingen
 Source : wikipedia
 Cat_value: 1
 Loc_value: 1

Title : New Ulm, Texas
 Source : wikipedia
 Cat_value: 1
 Loc_value: 28

Title : Ulm Tourism: Ulm, Germany Travel Guide | PlanetWare
 Source : yahoo
 Cat_value: 0
 Loc_value: 20

Title : Ulm Tourism: Ulm, Germany Travel Guide | PlanetWare
 Source : bing
 Cat_value: 0
 Loc_value: 20

Title : Ulm Münsterplatz 63 Germany 29082008002.jpg locr
 Source : yahoo
 Cat_value: -1
 Loc_value: 9

 ID : 5
 Filename: 05_westminster_abbey.jpg
 Date : 15.07.2009 14:21:17
 Category: Church
 Location: London
 Country : United Kingdom
 Temp : 23.0
 ICAO : EGGW
 Tags: london, uk, england, westminster, bigben, city,

Wikiarticles:
 Title : The Unknown Warrior
 Distance : 0.0132
 Value : 1

Title : Poets Corner
 Distance : 0.0323
 Value : 0

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Title : Westminster
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Title : Middlesex Guildhall
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Search articles:
 Title : List of churches in London
 Source : wikipedia
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Title : Scientology in the United Kingdom - Wikipedia, the free encyclopedia
 Source : yahoo
 Cat_value: 108
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Title : Nordic churches in London
 Source : wikipedia
 Cat_value: 85
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Title : St Columba's Church, London
 Source : wikipedia
 Cat_value: 43
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Title : Crown Court Church
Source : wikipedia
Cat_value: 37
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Title : St Bride's Church
Source : wikipedia
Cat_value: 27
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Title : United Kingdom - Conservapedia
Source : yahoo
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Title : All-Hallows-the-Great
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Title : ChristChurch London
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Title : Hillsong Church London
Source : wikipedia
Cat_value: 15
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Title : Metropolitan Community Church in East London
Source : wikipedia
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Title : Local business results for Church United Kingdom near London, UK
Source : google
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Title : St Alban, Wood Street
Source : wikipedia
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Title : French Protestant Church of London
Source : wikipedia
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Loc_value: 10

Title : Church of Scientology United Kingdom | What is Scientology? Find ...
Source : google
Cat_value: 11
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Title : Bishop of London
Source : wikipedia
Cat_value: 11
Loc_value: 61

Title : Church End Finchley
Source : wikipedia
Cat_value: 11
Loc_value: 13

Title : Church Street, London, United Kingdom : Reviews of Church Street ...
Source : yahoo
Cat_value: 10
Loc_value: 26

Title : List of Christopher Wren churches in London
Source : wikipedia
Cat_value: 10
Loc_value: 31

Title : Syro-Malabar Catholic Church of London
Source : wikipedia
Cat_value: 10
Loc_value: 6

Title : Metropolitan Community Church South London
Source : wikipedia
Cat_value: 10
Loc_value: 15

Title : Church Street Hotel in London, United Kingdom | SPLENDIA
Source : yahoo
Cat_value: 8
Loc_value: 35

Title : London - Wikipedia, the free encyclopedia
Source : yahoo
Cat_value: 7
Loc_value: 682

Title : Church Street Hotel, London, United Kingdom - TripTake.com - Look ...
Source : yahoo
Cat_value: 7
Loc_value: 19

Title : List of churches destroyed in the Great Fire of London and not rebuilt
Source : wikipedia
Cat_value: 7
Loc_value: 14

Title : The Church of England | Church of England
Source : google
Cat_value: 6
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Title : Metropolitan Community Church London
Source : wikipedia
Cat_value: 6
Loc_value: 10

Title : Commission for Building Fifty New Churches
Source : wikipedia
Cat_value: 6
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Title : Seventh-day Adventist Church - United Kingdom and Ireland
Source : google
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Title : List of churches rebuilt after the Great Fire of London but since demolished
Source : wikipedia
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Title : Hillsong Church London | Hillsong Church London
Source : google
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Title : Photos from LONDON, United Kingdom by photographer Svein-Magne Tunli ...
Source : yahoo
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Loc_value: 46

Title : The Moravian Church of the British Province
Source : google
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Title : London Gypsy Church United Kingdom
Source : google
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Title : London Gypsy Church United Kingdom
Source : yahoo
Cat_value: 1
Loc_value: 3

Title : London Travel Guides: Find out what to do in London when planning the ...
Source : yahoo
Cat_value: 1
Loc_value: 106

Title : Antiochian Orthodox Deanery of the United Kingdom and Ireland
Source : google
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Title : Concerts at the Church La Madeleine, London, United Kingdom ...
Source : yahoo
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Title : The Church of Jesus Christ of Latter-day Saints
Source : google
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Title : Church of Scientology London
Source : google
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Title : ACCC.org.uk - Armenian Community of the U.K.
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 Category: Bridge
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 Country : United States
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 Tags: sanfrancisco, california, goldengatebridge, bridge, usa, ship,

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Title : Lime Point Light
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 Category: Monument
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Title : Jefferson Pier
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Title : United States Holocaust Memorial Museum
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 Value : 1

Title : National World War II Memorial
 Distance : 0.4569
 Value : 13

Title : National Christmas Tree (United States)
 Distance : 0.5947
 Value : 2

Search articles:

Title : Washington Monument: Definition from Answers.com
 Source : yahoo
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Title : Washington Monument - Wikipedia, the free encyclopedia
 Source : yahoo
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Title : Washington Monument - Wikipedia, the free encyclopedia
 Source : google
 Cat_value: 86
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Title : Washington Monument - Wikipedia, the free encyclopedia
 Source : bing
 Cat_value: 86
 Loc_value: 88

Title : Washington Monument
 Source : wikipedia
 Cat_value: 86

Loc_value: 88

Title : World Architecture Images- Washington Monument
Source : yahoo
Cat_value: 67
Loc_value: 57

Title : Washington Monument - New World Encyclopedia
Source : yahoo
Cat_value: 61
Loc_value: 60

Title : A History of the Aluminum Cap of the Washington Monument
Source : google
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Title : snopes.com: Laus Deo and Washington Monument
Source : bing
Cat_value: 37
Loc_value: 73

Title : Washington Monument (monument, Washington, District of Columbia, United ...
Source : yahoo
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Title : Washington Monument (monument, Washington, District of Columbia ...
Source : bing
Cat_value: 35
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Title : The Washington Monument : On the National Mall at 15th Street Northwest ...
Source : yahoo
Cat_value: 34
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Title : Washington Monument (Baltimore)
Source : wikipedia
Cat_value: 30
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Title : Washington Monument State Park
Source : wikipedia
Cat_value: 26
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Title : Washington Monument : Washington Monument News and Photos ...
Source : google
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Title : Washington Monument, Washington
Source : bing
Cat_value: 23
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Title : Washington Monument definition of Washington Monument in the Free ...
Source : bing
Cat_value: 23
Loc_value: 31

Title : Washington Monument - EnchantedLearning.com
Source : google
Cat_value: 22
Loc_value: 19

Title : TourOfDC
Source : google
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Title : List of monuments dedicated to George Washington
Source : wikipedia
Cat_value: 16
Loc_value: 48

Title : Washington (District of Columbia, United States) -- Britannica Online ...
Source : bing
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Title : National Mall
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Title : National Mall - Wikipedia, the free encyclopedia
Source : google
Cat_value: 14

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Title : George Washington Birthplace National Monument
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Title : Zero Milestone
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Title : Eakins Oval
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Title : Monument
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Title : George Washington Carver National Monument
Source : wikipedia
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Title : Millennium Monument (Malaysia)
Source : wikipedia
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Loc_value: 2

Title : Presidential memorials in the United States - Wikipedia, the free ...
Source : yahoo
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Title : Booker T. Washington National Monument
Source : wikipedia
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Title : Washington Avenue Soldier's Monument and Triangle
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Loc_value: 5

Title : Washington, D.C.
Source : wikipedia
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Title : George Washington
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Loc_value: 364

Title : George Washington - Wikipedia, the free encyclopedia
Source : bing
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Title : United States Washington Monuments Photo Report - Travel
Source : bing
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Title : Washington Monument (West Point)
Source : wikipedia
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Title : Washington, District of Columbia Monument Attractions, United States
Source : yahoo
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Title : Address of the Washington national monument society to the people of ...
Source : bing
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Title : Billige hoteller Washington, District of Columbia, USA
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Title : Washington Monument Syndrome
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Title : Washington Monument ploy
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Title : Simã³n Bolã-var: The Liberator
Source : wikipedia
Cat_value: 3
Loc_value: 6

Title : Babcock Lakes
Source : wikipedia
Cat_value: 2
Loc_value: 6

Title : Washington, D.C. Tourism Information - United States House of ...
Source : google
Cat_value: 2
Loc_value: 38

Title : EarthCam: Capitol Cam
Source : yahoo
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Title : Washington Monument, yet again, Washington DC, United States
Source : google
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Title : These United States - Washington
Source : bing
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Title : Video results for Washington Monument United States
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Title : Washington, D.C.: Washington Monument; United States Capitol ...
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Location: Rome
Country : Italy
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Tags: roma, rome, colosseo, italia, italy, colosseum,

Wikiarticles:
Title : Colosseum
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Title : Arch of Constantine
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Title : Temple of Venus and Roma
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Title : Domus Aurea
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Title : Elagabalium
Distance : 0.2882
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Search articles:
Title : NCSU Libraries' - What: Architecture Where: Rome, Lazio, Italy
Source : bing
Cat_value: 162
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Title : Renaissance architecture
Source : wikipedia
Cat_value: 105

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Title : NCSU Libraries' - What: Architecture Where: Rome, Lazio, Italy
Source : bing
Cat_value: 103
Loc_value: 52

Title : Baroque architecture
Source : wikipedia
Cat_value: 69
Loc_value: 12

Title : Book results for Rome Architecture Italy
Source : google
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Loc_value: 40

Title : Italy Architecture Guide
Source : google
Cat_value: 34
Loc_value: 3

Title : Temple Rome Study Abroad: Semester Courses
Source : yahoo
Cat_value: 33
Loc_value: 73

Title : Beaux-Arts architecture
Source : wikipedia
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Loc_value: 4

Title : Architecture of ancient Rome
Source : wikipedia
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Loc_value: 19

Title : Italy
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Loc_value: 47

Title : France
Source : wikipedia
Cat_value: 19
Loc_value: 5

Title : Roman Architecture: Italy - Hutchinson encyclopedia article about ...
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Title : Rome - Wikipedia, the free encyclopedia
Source : google
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Title : Rome - Wikipedia, the free encyclopedia
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Title : Rome - Wikipedia, the free encyclopedia
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Title : Rome
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Title : Architecture in Rome at Frommer's
Source : yahoo
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Title : Architecture in Italy - Guide for Travelers to Italy - Italy Architecture
Source : yahoo
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Loc_value: 7

Title : Rome Medieval Architecture Tour featuring the medieval architecture of ...
Source : yahoo
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Title : Paolo Portoghesi
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Loc_value: 16

Title : Architecture of the Spanish Renaissance
Source : wikipedia
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Loc_value: 2

Title : Basilica
Source : wikipedia
Cat_value: 10
Loc_value: 21

Title : Amazon.ca: Architecture - Italy - Rome: Books
Source : yahoo
Cat_value: 9
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Title : Prix de Rome
Source : wikipedia
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Title : Roman Republic
Source : wikipedia
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Title : Colosseum
Source : wikipedia
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Title : Ancient Rome
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Title : Massimiliano Fuksas
Source : wikipedia
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Title : Culture of ancient Rome
Source : wikipedia
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Loc_value: 53

Title : Ancient Roman Architecture - Great Buildings Online
Source : google
Cat_value: 5
Loc_value: 16

Title : Architecture Design and Building in Rome, Italy 01 - Places ...
Source : google
Cat_value: 5
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Title : Pantheon in Rome Italy - Roman Architecture - Roman Pantheon
Source : google
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Title : Pantheon in Rome Italy - Roman Architecture - Roman Pantheon
Source : yahoo
Cat_value: 4
Loc_value: 10

Title : EUR Fascist Architecture, Suburb Of Rome, Italy - Video
Source : bing
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Loc_value: 21

Title : Pantheon in Rome Italy - Roman Architecture - Roman Pantheon
Source : bing
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Title : Architecture of Rome, Italy - Great Buildings Online
Source : google
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Title : ESUA -
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Title : ItalyGuides.it: The Roman architecture: the arch, Rome Italy
Source : yahoo
Cat_value: 3

Loc_value: 19

Title : Architecture of Rome, Italy - Great Buildings Online
 Source : bing
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Title : American Academy in Rome
 Source : wikipedia
 Cat_value: 3
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Title : History of Roman Architecture
 Source : google
 Cat_value: 2
 Loc_value: 3

Title : - Rome
 Source : yahoo
 Cat_value: 2
 Loc_value: 8

Title : Trophy (architectural)
 Source : wikipedia
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 Loc_value: 1

Title : Maecenas - Images of Ancient Greece and Rome
 Source : google
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 Loc_value: 23

Title : Rome Travel Information and Travel Guide - Italy - Lonely Planet
 Source : bing
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Title : Top Ancient Rome Sites - Where to See Ancient Rome History and ...
 Source : bing
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Title : Slow Travel Italy - Where to find Bernini in Rome, statues ...
 Source : bing
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Title : Piero Gemelli
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Title : Architecture of Rome, Italy :: Glass Steel and Stone
 Source : google
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Title : Rome, Italy
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Title : Lateran
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Title : Architetto a Roma - Architect Rome Italy - AP&C
 Source : google
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 Location: Pisa
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Title : Piazza dei Miracoli

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Title : Arena Garibaldi - Stadio Romeo Anconetani
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Title : Knights Square (Pisa)
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Search articles:

Title : Leaning Tower of Pisa: Definition from Answers.com
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Title : Leaning Tower of Pisa - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 72
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Title : Leaning Tower of Pisa - Wikipedia, the free encyclopedia
Source : google
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Title : Leaning Tower of Pisa - Wikipedia, the free encyclopedia
Source : yahoo
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Title : Leaning Tower of Pisa
Source : wikipedia
Cat_value: 71
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Title : Campanile
Source : wikipedia
Cat_value: 57
Loc_value: 4

Title : List of leaning towers
Source : wikipedia
Cat_value: 43
Loc_value: 10

Title : Leaning Tower - Pisa, Italy
Source : bing
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Loc_value: 22

Title : Leaning Tower of Pisa | Italy Travel Guide
Source : bing
Cat_value: 26
Loc_value: 31

Title : Visit Tower of Pisa - Tower of Pisa
Source : google
Cat_value: 22
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Title : History Of The Leaning Tower Of Pisa, Leaning Tower Of Pisa Italy ...
Source : bing
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Title : Leaning Tower of Pisa (tower, Pisa, Italy) -- Britannica Online ...
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Title : Leaning Tower of Pisa (tower, Pisa, Italy) -- Britannica Online ...
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Title : The Leaning Tower of Pisa Italy, History Of Leaning Tower Of Pisa ...
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Title : Leaning Tower of Pisa Pisa PI, Italy
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Title : The Unofficial Leaning Tower of Pisa Web Site
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Title : Leaning Tower of Pisa - Pisa, Italy - Great Buildings Online
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Title : The Unofficial Leaning Tower of Pisa Web Site
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Title : Leaning Tower of Niles
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Title : Leaning Tower of Suurhusen
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Title : St. Walfridus kerk
Source : wikipedia
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Title : Pisa Italy Travel Guide - Travel Information for Pisa Italy
Source : yahoo
Cat_value: 11
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Title : Pisa Pictures
Source : yahoo
Cat_value: 11
Loc_value: 14

Title : ItalyGuides.it: The Leaning Tower of Pisa - Pisa, Italy
Source : google
Cat_value: 9
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Title : ItalyGuides.it: The Leaning Tower of Pisa - Pisa, Italy
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Title : Oldehove (tower)
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Title : Pisa - Wikipedia, the free encyclopedia
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Title : Pisa
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Title : Diotisalvi
Source : wikipedia
Cat_value: 6
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Title : Pisa Tourism and Tourist Information: Information about Pisa Area ...
Source : bing
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Title : Galileo's Leaning Tower of Pisa experiment
Source : wikipedia
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Title : Leaning tower illusion
Source : wikipedia
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Title : Leaning Tower of Pisa, Tourist Attractions in Italy, Tower of Pisa
Source : google
Cat_value: 4
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Title : Italy - Pisa Video - Pisa Travel Videos - Tripfilms
Source : yahoo
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Title : Torre dei Gualandi
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Title : Italy
Source : wikipedia
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Title : War of Saint Sabas
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Title : Province of Pisa
Source : wikipedia
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Title : Bonanno Pisano
Source : wikipedia
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Title : ItalyGuides.it: Virtual travel to Pisa and the leaning tower ...
Source : google
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Loc_value: 9

Title : Panoramio - Photo of Pisa Tower / Pisa, Italy
Source : google
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Loc_value: 4

Title : Pisa in Virtual Reality
Source : yahoo
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Loc_value: 9

Title : ItalyGuides.it: A virtual travel to Pisa and the leaning tower - Pisa Italy
Source : yahoo
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Title : ItalyGuides.it: Virtual travel to Pisa and the leaning tower, travel ...
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Title : LTP
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Title : Pisa (disambiguation)
Source : wikipedia
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Title : William Henry Goodyear
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Title : Image results for Pisa Tower Italy
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Title : Video results for Pisa Tower Italy
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Title : The Leaning-Tower of Pisa Italy
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Title : Pont d'Iéna
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Title : 7th Arrondissement Eiffel Tower Vacation Apartment Rentals, 7e Paris
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Title : 7th Arrondissement Eiffel Tower Vacation Apartment Rentals, 7e Paris
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Title : Eiffel Tower Area 7e 15e arrondissement Hotels and Travel Paris
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Title : Eiffel Tower Area 7e 15e arrondissement Hotels and Travel Paris
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Title : 7th arrondissement travel guide - Wikitravel
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Title : 7th arrondissement travel guide - Wikitravel
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Title : Paris Hotels near 7e Arrondissement in Paris, France - Yahoo! Travel
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Title : Paris Hotels near 7e Arrondissement in Paris, France - Yahoo! Travel
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Title : Paris Saint-Germain F.C.
Source : wikipedia
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Title : 7th arrondissement of Paris photos on Fotopedia - The Photo ...
Source : google
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Title : Paris Abotel Paris Hotels near 7e Arrondissement in Paris, France ...
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Title : 7th arrondissement of Paris - Wikipedia, the free encyclopedia
Source : google
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Title : 7th arrondissement of Paris - Wikipedia, the free encyclopedia
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Title : Hotel Apartments Paris, France
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Title : 7e Arrondissement Hotels | Paris | Fodor's Hotel Reviews
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Title : Champ de Mars, 7e Arrondissement, Paris, France
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Title : Hotel Les Jardins D' Eiffel, Paris 7eme Arrondissement | LateRooms
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Title : Youth hostels Paris 7e Arrondissement Paris Paris - Ile de France France
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Title : List of tallest hotels in the world
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Title : Dubai Hotels in United Arab Emirates (UAE) - DirectRooms

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Title : Dubai hotels and accommodation, hotel reservations in United Arab ...
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Title : Booking.com: 282 hotels in Dubai, United Arab Emirates. Book your ...
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Title : Hydropolis Underwater Hotel, Dubai, United Arab Emirates | Dubai for ...
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Title : Ice Hotel | Jukkasjärvi, Sweden - SkyscraperCity
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Title : Ice Hotel In Sweden | TheContaminated - Cool Pictures, Weird Pictures ...
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Title   : Brandenburg Gate (gateway, Berlin, Germany) -- Britannica Online ...
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Title   : Brandenburg Gate (Kaliningrad)
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Title : Berlin cam overlooking the Brandenburg gate in Berlin Germany
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Title : Berlin | TripSay.com
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Title : Tear down this wall
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Title : Embassy of the United States - Berlin, Germany: Homepage
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Title : Stock Photos of Berlin, Brandenburg Gate, Germany, Europe ...
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Title : Berlin Photos: Brandenburg Gate, Germany | Frommers.com
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Title : Brandenburg Gate Berlin Germany - 360° Panorama
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Title : Berlin Germany - Welcome to Berlin
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Title : Berlin Travel Information and Travel Guide - Germany - Lonely Planet
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Title : YouTube - Barack Obama Speech from Berlin, Germany
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Title : Berlin Germany Tourist Information and Travel Guide
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Title : Moscow gets GRP bridge to beat corrosion | Fiberline Composites
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Title : Moscow restricts traffic over bridge linking Russia with Estonia | Top ...
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Loc_value: 38

Title : Russian school in Moscow, Russia
Source : bing
Cat_value: 1
Loc_value: 32

Title : Moscow, Russia - Hutchinson encyclopedia article about Moscow, Russia
 Source : bing
 Cat_value: 1
 Loc_value: 44

Title : Kuznetsky Most (Metro)
 Source : wikipedia
 Cat_value: 1
 Loc_value: 3

Title : Main page | The Moscow Times | Daily newspaper
 Source : bing
 Cat_value: 0
 Loc_value: 10

Title : Moscow, Russia - What does MOW stand for? Acronyms and abbreviations ...
 Source : bing
 Cat_value: 0
 Loc_value: 9

Title : Moscow, Russia definition of Moscow, Russia in the Free Online ...
 Source : bing
 Cat_value: 0
 Loc_value: 62

Title : Video results for Moscow Bridge Russia
 Source : google
 Cat_value: -1
 Loc_value: -1

 ID : 16
 Filename: 16_north_shore_surfing.jpg
 Date : 28.04.2009 13:46:37
 Category: Surfing
 Location: Haleiwa
 Country : United States
 Temp : 22.0
 ICAO : PHHI
 Tags: hawaii, waimea, beach, oahu, pacific, pacificocean,

Wikiarticles:
 Title : Waimea Bay, Hawaii
 Distance : 0.3355
 Value : 10

Search articles:
 Title : Sunny Garcia
 Source : wikipedia
 Cat_value: 24
 Loc_value: 4

Title : Best Surfing in Haleiwa - All Time | nextstop.com
 Source : google
 Cat_value: 22
 Loc_value: 13

Title : Western Surfing Association Teams with The United States Marine Corps ...
 Source : bing
 Cat_value: 21
 Loc_value: 1

Title : Rabbit Kekai
 Source : wikipedia
 Cat_value: 19
 Loc_value: 1

Title : Triple Crown of Surfing
 Source : wikipedia
 Cat_value: 18
 Loc_value: 4

Title : List of surfers
 Source : wikipedia
 Cat_value: 18
 Loc_value: 1

Title : Surfing in Haleiwa | Haleiwa Surfing | Activity & Adventure
 Source : yahoo
 Cat_value: 14
 Loc_value: 8

Title : Learn to Surf in Hawaii (Surfing) - Haleiwa, United States
 Source : yahoo
 Cat_value: 12
 Loc_value: 10

Title : List of surfing areas

Source : wikipedia
Cat_value: 12
Loc_value: 1

Title : Haleiwa Travel Guide || Jaunted
Source : yahoo
Cat_value: 11
Loc_value: 9

Title : Eddie Aikau
Source : wikipedia
Cat_value: 11
Loc_value: 1

Title : Local business results for Surfing United States near Haleiwa, HI
Source : google
Cat_value: 10
Loc_value: 9

Title : Bethany Hamilton
Source : wikipedia
Cat_value: 10
Loc_value: 1

Title : Waimea Bay, Hawaii
Source : wikipedia
Cat_value: 10
Loc_value: 1

Title : Mark Richards (surfer)
Source : wikipedia
Cat_value: 8
Loc_value: 2

Title : SofĀ-a MulĀĭnovich
Source : wikipedia
Cat_value: 8
Loc_value: 1

Title : Haleiwa Surfing Vacations - Real Travel
Source : google
Cat_value: 7
Loc_value: 19

Title : OahuSurfPhotos.com in Haleiwa, United States - Localyte.com
Source : yahoo
Cat_value: 7
Loc_value: 29

Title : Haleiwa,Haleiwa surf,Haleiwa surfing,USA, Hawaii, Oahu, WannaSurf ...
Source : google
Cat_value: 6
Loc_value: 15

Title : Haleiwa,Haleiwa surf,Haleiwa surfing,USA, Hawaii, Oahu, WannaSurf ...
Source : bing
Cat_value: 6
Loc_value: 15

Title : List of fatal, unprovoked shark attacks in the United States ...
Source : bing
Cat_value: 6
Loc_value: 1

Title : List of fatal, unprovoked shark attacks in the United States
Source : wikipedia
Cat_value: 6
Loc_value: 1

Title : Frederick Patacchia
Source : wikipedia
Cat_value: 6
Loc_value: 1

Title : Haleiwa, Oahu - Panoramic Earth Travel Information
Source : bing
Cat_value: 5
Loc_value: 15

Title : United States Adventure Travel Guide & Activities to do in United ...
Source : bing
Cat_value: 5
Loc_value: 3

Title : Haleiwa Surfing Vacation Rentals,Haleiwa Surfing Rentals,Haleiwa ...
Source : yahoo
Cat_value: 4
Loc_value: 7

Title : John John Florence

Source : wikipedia
Cat_value: 3
Loc_value: 2

Title : Pipeline Bodsurfing Classic
Source : wikipedia
Cat_value: 3
Loc_value: 1

Title : Haleiwa: Sunset Suratt Surf School - TripAdvisor
Source : google
Cat_value: 2
Loc_value: 46

Title : Haleiwa Vacation Rental,Haleiwa Vacation Homes,Haleiwa Condo,Beach ...
Source : google
Cat_value: 2
Loc_value: 11

Title : Home Exchanges Hawaii United States Waialua Haleiwa
Source : yahoo
Cat_value: 2
Loc_value: 4

Title : Inside Haleiwa : Inside - TripAdvisor
Source : bing
Cat_value: 2
Loc_value: 44

Title : That's Easy, the Hale'iwa Surf Shop and Matsumoto Store for Some ...
Source : google
Cat_value: 1
Loc_value: 0

Title : Hale'iwa, Hawai'i - Wikipedia, the free encyclopedia
Source : yahoo
Cat_value: 1
Loc_value: 5

Title : Baby Haleiwa, United States, Surf Forecast and Surf Reports - surf ...
Source : yahoo
Cat_value: 1
Loc_value: 18

Title : Haleiwa travel guide
Source : bing
Cat_value: 1
Loc_value: 20

Title : Haleiwa Oahu Hawaii Vacation Rentals - North Shore of Oahu surfing ...
Source : bing
Cat_value: 1
Loc_value: 9

Title : Haleiwa City Travel Guide | PlanetEye
Source : bing
Cat_value: 1
Loc_value: 3

Title : Hale'iwa, Hawai'i - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 1
Loc_value: 5

Title : Fred Patacchia
Source : wikipedia
Cat_value: 1
Loc_value: 1

Title : Hale'iwa, Hawai'i
Source : wikipedia
Cat_value: 1
Loc_value: 4

Title : North Shore Shrimp Trucks
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Haleiwa/Toilet Bowl, United States, Surf Forecast and Surf Reports ...
Source : google
Cat_value: 0
Loc_value: 19

Title : Haleiwa Surf Report - weather.com
Source : google
Cat_value: 0
Loc_value: 4

Title : Accommodation in Haleiwa and Cheap Travel to Haleiwa, Hawaii ...

Source : google
 Cat_value: 0
 Loc_value: 14

Title : Haleiwa Vacation Rentals | Vacation & Holiday Rentals - Villas, Condos ...
 Source : yahoo
 Cat_value: 0
 Loc_value: 11

Title : Craig MacIntosh
 Source : wikipedia
 Cat_value: 0
 Loc_value: 1

Title : Maya Gabeira
 Source : wikipedia
 Cat_value: 0
 Loc_value: 0

Title : Turtle Bay Resort
 Source : wikipedia
 Cat_value: 0
 Loc_value: 0

Title : Haleiwa Vacation Rentals - Rental Houses, Apartments and Condos in ...
 Source : google
 Cat_value: -1
 Loc_value: -1

Title : Learn to Paddleboard in Hawaii (Surfing) - Haleiwa, United States
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

ID : 17
 Filename: 17_tahiti.jpg
 Date : 20.04.2009 13:44:32
 Category: Surfing
 Location: Tairapu-Est
 Country : French Polynesia
 Temp : 32.0
 ICAO : NTAA
 Tags:

Wikiarticles:
 Title : Teahupoo
 Distance : 0.6189
 Value : 8

Search articles:
 Title : South Padre Surf Cam - South Padre Island Texas Live Surf Cam ...
 Source : google
 Cat_value: 45
 Loc_value: 0

Title : Charly Va'a International's Blog - Windows Live
 Source : yahoo
 Cat_value: 15
 Loc_value: 0

Title : Teahupoo - Kosmix : Reference, Videos, Images, News, Shopping and more...
 Source : yahoo
 Cat_value: 14
 Loc_value: 0

Title : Having the best time surfing at Teahupoo on Flickr - Photo Sharing!
 Source : bing
 Cat_value: 13
 Loc_value: 0

Title : Teahupoo // BlogCatalog Topic // BlogCatalog
 Source : yahoo
 Cat_value: 7
 Loc_value: 0

Title : Huahine - Kosmix : Reference, Videos, Images, News, Shopping and more...
 Source : yahoo
 Cat_value: 5
 Loc_value: 0

Title : Smooth wave riding at Teahupoo. on Flickr - Photo Sharing!
 Source : yahoo
 Cat_value: 5
 Loc_value: 0

Title : tahiti guide : bora bora weather - tahiti shopping - bora bora wedding
 Source : yahoo

Cat_value: 4
 Loc_value: 0

 Title : tahiti guide : bora bora weather - tahiti shopping - bora bora wedding
 Source : bing
 Cat_value: 4
 Loc_value: 0

 Title : 2008 Teahupoo Billabong Surf Competition on Flickr - Photo Sharing!
 Source : google
 Cat_value: 3
 Loc_value: 0

 Title : Flickrriver: Most interesting photos from Tairapu-Est, Windward ...
 Source : google
 Cat_value: 2
 Loc_value: 0

 Title : Surfer conquering the waves at Teahupoo. - a photo on Flickrriver
 Source : google
 Cat_value: 1
 Loc_value: 0

 Title : Spa Hotel French Polynesia - trivago
 Source : google
 Cat_value: 1
 Loc_value: 0

 Title : scubish.com: Travel information for Tahiti
 Source : yahoo
 Cat_value: 1
 Loc_value: 0

 Title : Polynesian Cuisine - Kosmix : Reference, Videos, Images, News ...
 Source : bing
 Cat_value: 1
 Loc_value: 0

 Title : Photos & Video taken in Tairapu-Est on Flickr!
 Source : google
 Cat_value: 0
 Loc_value: 0

 Title : Image:Flag of French Polynesia.svg - Wikipedia, the free encyclopedia
 Source : google
 Cat_value: 0
 Loc_value: 0

 Title : Mehetia (Important Birds Areas of French Polynesia)
 Source : google
 Cat_value: 0
 Loc_value: 0

 Title : Mehetia (Important Birds Areas of French Polynesia)
 Source : google
 Cat_value: 0
 Loc_value: 0

 Title : Tahiti: Weather from Answers.com
 Source : google
 Cat_value: 0
 Loc_value: 0

 Title : Image:Flag of French Polynesia.svg - Wikipedia, the free encyclopedia
 Source : yahoo
 Cat_value: 0
 Loc_value: 0

 Title : Edicion de Cocinas
 Source : yahoo
 Cat_value: 0
 Loc_value: 0

 Title : Image:Flag of French Polynesia.svg - Wikipedia, the free encyclopedia
 Source : bing
 Cat_value: 0
 Loc_value: 0

 Title : Tahiti
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

 ID : 18
 Filename: 18_hersonissos_crete.jpg
 Date : 10.10.2009 13:33:13
 Category: Beach
 Location: Limenas Chersonisou

Cat_value: 5
Loc_value: 0

Title : Heraklion Flights - Cheap Flight to Heraklion, Greece (HER ...
Source : yahoo
Cat_value: 5
Loc_value: 0

Title : Royal Belvedere (Hersonissos, Greece) - Hotel Reviews - TripAdvisor
Source : google
Cat_value: 4
Loc_value: 0

Title : Kreta - Hersonissos, Greece Travel Blog
Source : google
Cat_value: 3
Loc_value: 0

Title : Chersonissos
Source : yahoo
Cat_value: 2
Loc_value: 0

Title : Car Hire Crete - Chersonissos Lyttos - Sixt rent a car.
Source : bing
Cat_value: 2
Loc_value: 0

Title : Hotell Kreta, Hellas
Source : bing
Cat_value: 2
Loc_value: 0

Title : Car Hire Crete - Chersonissos Lyttos - Sixt rent a car.
Source : bing
Cat_value: 2
Loc_value: 0

Title : Crete Hotels Greece - Cheap Hotels in Crete 85% Off.
Source : bing
Cat_value: 2
Loc_value: 0

Title : Photos & Video taken in Limenas Chersonisou on Flickr!
Source : google
Cat_value: 1
Loc_value: 0

Title : Photos & Video taken in Limenas Chersonisou on Flickr!
Source : bing
Cat_value: 1
Loc_value: 0

Title : Hersonissos - Wikipedia, the free encyclopedia
Source : bing
Cat_value: 1
Loc_value: 0

Title : Imperial Belvedere Hotel, Heraklion Hotels, Greece : DISCOUNT RATES!
Source : bing
Cat_value: 1
Loc_value: 0

Title : Hersonissos
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Hotel Royal Belvedere Limenas Hersonissou, Crete, Greece - Reviews ...
Source : yahoo
Cat_value: 0
Loc_value: 0

ID : 19
Filename: 19_polar_zoo.jpg
Date : 10.10.2009 13:33:13
Category: Zoo
Location: Fosbakken
Country : Norway
Temp : 0.0
ICAO : ENDU
Tags: norway, polarzoo,

Wikiarticles:

Search articles:
Title : Norway Guide: Kristiansand Zoo and Amusement Park, Kristiansand ...
Source : google

Cat_value: 9
Loc_value: 0

Title : Krangler om Knut - Folkebladet.no
Source : yahoo
Cat_value: 8
Loc_value: 1

Title : Får egen TV-serie - Folkebladet.no
Source : google
Cat_value: 7
Loc_value: 1

Title : National Zoo (Zoologisk Have), Parks and gardens, Copenhagen ...
Source : google
Cat_value: 6
Loc_value: 0

Title : Norway Top Attractions; Kristiansand Zoo and Amusement Park, Norway
Source : google
Cat_value: 4
Loc_value: 0

Title : Stokkan kommer - Folkebladet.no
Source : bing
Cat_value: 4
Loc_value: 1

Title : Arctic Fox - Side View on Flickr - Photo Sharing!
Source : google
Cat_value: 3
Loc_value: 2

Title : Making a new friend on Flickr - Photo Sharing!
Source : google
Cat_value: 3
Loc_value: 2

Title : Visit Bardu gir turisme-håp - Folkebladet.no
Source : google
Cat_value: 3
Loc_value: 1

Title : VinterÅpent i Polar Zoo - Folkebladet.no
Source : bing
Cat_value: 3
Loc_value: 0

Title : Mattilsynet vannverk
Source : yahoo
Cat_value: 2
Loc_value: 3

Title : Mattilsynet vannverk
Source : bing
Cat_value: 2
Loc_value: 3

Title : Scandinavia
Source : google
Cat_value: 1
Loc_value: 1

Title : The Lavangen Tour
Source : google
Cat_value: 1
Loc_value: 4

Title : Reiselivsbasen: Lodging Troms county / Norway
Source : google
Cat_value: 1
Loc_value: 1

Title : Det virituelle Norge | www.nordlys.no
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : LAVANGEN
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : 180.no - Tynset (2500)
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : Nye selskaper i Troms - nordlys.no
Source : yahoo

Cat_value: 1
 Loc_value: 1

Title : The Lavangen Tour
 Source : bing
 Cat_value: 1
 Loc_value: 4

Title : Scandinavia
 Source : bing
 Cat_value: 1
 Loc_value: 1

Title : 180.no - Tynset (2500)
 Source : bing
 Cat_value: 1
 Loc_value: 0

Title : Det virituelle Norge | www.nordlys.no
 Source : bing
 Cat_value: 1
 Loc_value: 1

Title : Nye selskaper i Troms | www.nordlys.no
 Source : bing
 Cat_value: 1
 Loc_value: 1

Title : LAVANGEN
 Source : bing
 Cat_value: 1
 Loc_value: 1

Title : Bjørnesensasjon i Polar Zoo
 Source : yahoo
 Cat_value: 0
 Loc_value: 1

Title : 180.no - Elnesvågen
 Source : yahoo
 Cat_value: 0
 Loc_value: 0

Title : Nettkatalogen.no : Elnesvågen (6440)
 Source : bing
 Cat_value: 0
 Loc_value: 0

Title : Masterseek international Business Search Engine & Directory
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

Title : Norsk Varemerketidende nr 24/05
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

 ID : 20
 Filename: 20_uluru.JPG
 Date : 13.11.2008 11:21:17
 Category: Mountain
 Location: Mutitjulu
 Country : Australia
 Temp : None
 ICAO : YAYE
 Tags: australia, uluru, tour, mulga, canyon, olga,

Wikiarticles:
 Title : Uluru
 Distance : 0.3642
 Value : 4

Search articles:
 Title : Uluru
 Source : wikipedia
 Cat_value: 4
 Loc_value: 5

Title : Uluru - Wikipedia, the free encyclopedia
 Source : google
 Cat_value: 4
 Loc_value: 5

Title : Uluru - a set on Flickr
 Source : google
 Cat_value: 4

Loc_value: 5

Title : Enlightenment - The Experience Festival
Source : google
Cat_value: 4
Loc_value: 13

Title : Uluru - Wikipedia, the free encyclopedia
Source : yahoo
Cat_value: 4
Loc_value: 5

Title : Uluru: Information from Answers.com
Source : yahoo
Cat_value: 4
Loc_value: 5

Title : About Australia: Escorted Tours
Source : google
Cat_value: 3
Loc_value: 2

Title : Sacred Sites: Places of Peace and Power
Source : yahoo
Cat_value: 2
Loc_value: 2

Title : Uluru / Ayers Rock - impressions and interesting facts
Source : yahoo
Cat_value: 1
Loc_value: 2

Title : Agenda 21 - Australia
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : Uluru/Ayers Rock Outback Adventure, Uluru, Ayers Rock, Mala Walk ...
Source : google
Cat_value: 1
Loc_value: 2

Title : 3 DAY TOUR FROM ALICE SPRINGS TO ULURU AND KINGS CANYON EXPERIENCE ...
Source : yahoo
Cat_value: 0
Loc_value: 2

Title : Timeline of Australian history
Source : wikipedia
Cat_value: 0
Loc_value: 1

Title : Mutitjulu NT @ ExplorOz
Source : google
Cat_value: 0
Loc_value: 8

Title : OPAL FUEL INTRODUCED TO RED CENTRE PROPERTIES
Source : google
Cat_value: 0
Loc_value: 7

Title : Wapedia - Wiki: Uluru
Source : google
Cat_value: 0
Loc_value: 0

Title : Activities and tours in Northern Territory - NT, All Regions
Source : google
Cat_value: 0
Loc_value: 0

Title : Australia & New Zealand
Source : yahoo
Cat_value: -1
Loc_value: -1

Title : FOOD
Source : yahoo
Cat_value: -1
Loc_value: -1

Title : Uluru - Kata Tjuta Board of Management (2000) (pdf).
Source : yahoo
Cat_value: -1
Loc_value: -1

Title : Ayers Rock, Uluru
Source : google
Cat_value: -1

Loc_value: -1

Title : Ayers Rock, Uluru
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

 ID : 21
 Filename: 21_manchester_united_vs_sunderland.jpg
 Date : 06.12.2008 15:21:17
 Category: Football
 Location: Manchester
 Country : United Kingdom
 Temp : 5.0
 ICAO : EGCC
 Tags: manchester, oldtrafford, football, manchesterunited, uk, england,

Wikiarticles:
 Title : Old Trafford
 Distance : 0.0184
 Value : 52

Title : Sir Matt Busby Way
 Distance : 0.1409
 Value : 2

Title : White City, Manchester
 Distance : 0.5399
 Value : 0

Title : Old Trafford Cricket Ground
 Distance : 0.8064
 Value : 4

Title : The Lowry
 Distance : 0.9146
 Value : 1

Search articles:
 Title : Premier League - FOOTBALL - Football : info foot, rÃ©sultats ...
 Source : bing
 Cat_value: 95
 Loc_value: 53

Title : Manchester United F.C.
 Source : wikipedia
 Cat_value: 75
 Loc_value: 152

Title : Manchester City F.C.
 Source : wikipedia
 Cat_value: 54
 Loc_value: 130

Title : F.C. United of Manchester
 Source : wikipedia
 Cat_value: 33
 Loc_value: 41

Title : Liverpool F.C. and Manchester United F.C. rivalry
 Source : wikipedia
 Cat_value: 26
 Loc_value: 65

Title : Manchester Central F.C.
 Source : wikipedia
 Cat_value: 18
 Loc_value: 35

Title : Manchester Football League
 Source : wikipedia
 Cat_value: 17
 Loc_value: 12

Title : Hyde Road
 Source : wikipedia
 Cat_value: 17
 Loc_value: 54

Title : Manchester derby
 Source : wikipedia
 Cat_value: 14
 Loc_value: 69

Title : Lazio Vs Inter Milan 0-3 Highlights 06.12.2008 | Football Kits Online
 Source : yahoo
 Cat_value: 13

Loc_value: 2

Title : MaltaSport - English League
Source : bing
Cat_value: 11
Loc_value: 0

Title : Manchester Football Association
Source : wikipedia
Cat_value: 11
Loc_value: 31

Title : Calendrier, RÅ@sultats Manchester United - Angleterre - Football sur ...
Source : bing
Cat_value: 10
Loc_value: 55

Title : Manchester Rugby Club
Source : wikipedia
Cat_value: 10
Loc_value: 20

Title : Manchester Wolves
Source : wikipedia
Cat_value: 10
Loc_value: 16

Title : 06.12.2008 - Manchester U. 1-0 Sunderland
Source : google
Cat_value: 8
Loc_value: 4

Title : 06.12.2008 - Hull C. 2-1 Middlesbrough
Source : google
Cat_value: 8
Loc_value: 2

Title : Rob Edwards (English footballer)
Source : wikipedia
Cat_value: 8
Loc_value: 4

Title : 06.12.2008 - Besiktas 3 - 1 Gaziantep BB
Source : yahoo
Cat_value: 7
Loc_value: 1

Title : Sport: Amerikanske Idretter - VG Nett Debatt
Source : yahoo
Cat_value: 6
Loc_value: 0

Title : Manchester Spartans
Source : wikipedia
Cat_value: 6
Loc_value: 7

Title : Paul McGuinness (footballer)
Source : wikipedia
Cat_value: 6
Loc_value: 12

Title : Manchester United 2008-2009 Results - statto.com
Source : google
Cat_value: 5
Loc_value: 11

Title : Football, England, Premier League 2008/2009: Arsenal vs. Liverpool ...
Source : google
Cat_value: 5
Loc_value: 1

Title : "Den nordiske krigeren" | fvn.no
Source : yahoo
Cat_value: 5
Loc_value: 2

Title : Calendrier, RÅ@sultats Manchester City - Angleterre - Football sur ...
Source : bing
Cat_value: 5
Loc_value: 45

Title : Calendrier, RÅ@sultats Manchester United - Angleterre - Football sur ...
Source : bing
Cat_value: 5
Loc_value: 45

Title : Soccerana - Man Utd VS Sunderland (06-12-2008)
Source : bing
Cat_value: 5

Loc_value: 3

Title : Mike Milligan (footballer)
Source : wikipedia
Cat_value: 5
Loc_value: 3

Title : Red Cards
Source : google
Cat_value: 4
Loc_value: 5

Title : YouTube - Football717's Channel
Source : bing
Cat_value: 3
Loc_value: 48

Title : Steve Kinsey (footballer)
Source : wikipedia
Cat_value: 3
Loc_value: 7

Title : football | betting | premier | pc | manchester | Mister Wong
Source : google
Cat_value: 2
Loc_value: 3

Title : Manchester Senior Cup
Source : wikipedia
Cat_value: 2
Loc_value: 46

Title : Manchester United Premier Cup
Source : wikipedia
Cat_value: 2
Loc_value: 13

Title : David White (English footballer)
Source : wikipedia
Cat_value: 2
Loc_value: 9

Title : Newest Motd Videos - Page 5 - Metacafe
Source : google
Cat_value: 1
Loc_value: 3

Title : Robinho ser for seg 10 nye år i Manchester City - sport - Dagbladet.no
Source : yahoo
Cat_value: 1
Loc_value: 12

Title : Studenthuset Rokken - Rokken Café / Nyhende
Source : yahoo
Cat_value: 1
Loc_value: 4

Title : idrett.speaker.no
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : Mark Hughes (Manchester City) - Football - transfermarkt.co.uk
Source : google
Cat_value: 0
Loc_value: 74

Title : Statistics for Manchester City.Number of goals HT-FT results and ...
Source : google
Cat_value: 0
Loc_value: 7

Title : fotballnyheter - arkiv - 2008
Source : yahoo
Cat_value: 0
Loc_value: 38

Title : Ferguson will mit Manchester Siegesserie ausbauen - Magazin - Sport ...
Source : yahoo
Cat_value: 0
Loc_value: 12

Title : fotballnyheter fra 2007
Source : yahoo
Cat_value: 0
Loc_value: 15

Title : Manchester Rugby Club | Cheshire | Rugby Football Union
Source : bing
Cat_value: 0

Loc_value: 8

Title : MyP2P.eu :: English Premier League - Fulham FC vs. Manchester City
 Source : bing
 Cat_value: 0
 Loc_value: 1

Title : Mark Lynch (association footballer)
 Source : wikipedia
 Cat_value: 0
 Loc_value: 5

Title : Video results for Manchester Football 06.12.2008
 Source : google
 Cat_value: -1
 Loc_value: -1

Title : Random football rumour
 Source : bing
 Cat_value: -1
 Loc_value: -1

 ID : 22
 Filename: 22_manchester_united_vs_aalborg.jpg
 Date : 10.12.2008 20:21:17
 Category: Football
 Location: Manchester
 Country : United Kingdom
 Temp : 2.0
 ICAO : EGCC
 Tags: manchester, oldtrafford, football, manchesterunited, uk, england,

Wikiarticles:

Title : Old Trafford
 Distance : 0.0184
 Value : 52

Title : Sir Matt Busby Way
 Distance : 0.1409
 Value : 2

Title : White City, Manchester
 Distance : 0.5399
 Value : 0

Title : Old Trafford Cricket Ground
 Distance : 0.8064
 Value : 4

Title : The Lowry
 Distance : 0.9146
 Value : 1

Search articles:

Title : Manchester United F.C.
 Source : wikipedia
 Cat_value: 75
 Loc_value: 152

Title : Manchester City F.C.
 Source : wikipedia
 Cat_value: 54
 Loc_value: 130

Title : Football Transfer Rumours
 Source : bing
 Cat_value: 50
 Loc_value: 409

Title : F.C. United of Manchester
 Source : wikipedia
 Cat_value: 33
 Loc_value: 41

Title : Funny Football Club Names
 Source : bing
 Cat_value: 26
 Loc_value: 4

Title : Liverpool F.C. and Manchester United F.C. rivalry
 Source : wikipedia
 Cat_value: 26
 Loc_value: 65

Title : FC Porto v Arsenal 2008/9
 Source : bing
 Cat_value: 20

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Title : Manchester Central F.C.
Source : wikipedia
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Title : Manchester Football League
Source : wikipedia
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Title : Hyde Road
Source : wikipedia
Cat_value: 17
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Title : TheGame - Times Online - WBLG: Manchester United
Source : bing
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Title : TheGame - Times Online - WBLG: Manchester City
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Title : Manchester derby
Source : wikipedia
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Title : Manchester Football Association
Source : wikipedia
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Loc_value: 31

Title : CHAMPIONS LEAGUE - Results from Premier League
Source : google
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Loc_value: 17

Title : Manchester Rugby Club
Source : wikipedia
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Loc_value: 20

Title : Manchester Wolves
Source : wikipedia
Cat_value: 10
Loc_value: 16

Title : Launching www.transfermarkt.co.uk - Board: Discussion Board ...
Source : google
Cat_value: 9
Loc_value: 0

Title : peroni - submitted: Humsurfer
Source : google
Cat_value: 8
Loc_value: 9

Title : Tevez talks ongoing - Manchester United Official Web Site
Source : bing
Cat_value: 8
Loc_value: 3

Title : Rob Edwards (English footballer)
Source : wikipedia
Cat_value: 8
Loc_value: 4

Title : 10.12.2008 - Manchester U. 2-2 Aalborg BK
Source : google
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Title : MANCHESTER UNITED V AALBORG FOOTBALL PROGRAM 08 on eBay (end time ...
Source : google
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Loc_value: 7

Title : 10.12.2008 - Manchester U. 2-2 Aalborg BK
Source : yahoo
Cat_value: 7
Loc_value: 3

Title : Vassell is right man for the job - Manchester City - Football - Sport ...
Source : bing
Cat_value: 6

Loc_value: 17

Title : Manchester Spartans
Source : wikipedia
Cat_value: 6
Loc_value: 7

Title : Paul McGuinness (footballer)
Source : wikipedia
Cat_value: 6
Loc_value: 12

Title : Manchester United 2008-2009 Results - statto.com
Source : google
Cat_value: 5
Loc_value: 11

Title : Fergie's first thirst - Manchester United - Football - Sport ...
Source : bing
Cat_value: 5
Loc_value: 12

Title : Mike Milligan (footballer)
Source : wikipedia
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Title : Steve Kinsey (footballer)
Source : wikipedia
Cat_value: 3
Loc_value: 7

Title : Manchester United vs Celtic 1-0 Goals and Highlights 2008-10-21 ...
Source : google
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Title : Football: Ligue des Champions 2008-2009 Groupe E, les résultats
Source : bing
Cat_value: 2
Loc_value: 7

Title : Manchester Senior Cup
Source : wikipedia
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Title : Manchester United Premier Cup
Source : wikipedia
Cat_value: 2
Loc_value: 13

Title : David White (English footballer)
Source : wikipedia
Cat_value: 2
Loc_value: 9

Title : CRISTIANO-MANIA.DE || YOUR #1 GERMAN & ENGLISH SOURCE ABOUT ...
Source : google
Cat_value: 1
Loc_value: 8

Title : Full-Match-Torrents - Manchester United Highlights Goals
Source : google
Cat_value: 1
Loc_value: 117

Title : Studenthuset Rokken - Rokken Café / Nyhende
Source : yahoo
Cat_value: 1
Loc_value: 4

Title : Ronaldo vil bli toppscorer - helgeland-arbeiderblad.no
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : Advocaat på vei til australsk fotball - retten.no
Source : yahoo
Cat_value: 1
Loc_value: 1

Title : Campbell: - Jeg ville elsket å spille for United | TV 2 Sporten
Source : yahoo
Cat_value: 1
Loc_value: 5

Title : Dates for 2008/09 UEFA Champions League
Source : yahoo
Cat_value: 0

Loc_value: 2

Title : Utestengt i tre kamper - Rogalands Avis - Vi gir deg Stavanger!
Source : yahoo
Cat_value: 0
Loc_value: 15

Title : Storm til Haugesund - oyene.no
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : fotballnyheter - arkiv - 2008
Source : yahoo
Cat_value: 0
Loc_value: 38

Title : Må sove på stasjoner under EM - an.no
Source : yahoo
Cat_value: 0
Loc_value: 1

Title : Manchester Rugby Club | Cheshire | Rugby Football Union
Source : bing
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Title : Mark Lynch (association footballer)
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Search articles:
Title : SK Brann 2009
Source : wikipedia
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Title : - Synes ikke synd på Vålerenga - sport - Dagbladet.no
Source : yahoo
Cat_value: 14
Loc_value: 7

Title : Valerenga Idrettsforening Fotball v Tromso Live | Watch Live Football TV
Source : yahoo
Cat_value: 14
Loc_value: 15

Title : Siste nytt før Tippeliga-runden | TV 2 Sporten | Fotball
Source : google
Cat_value: 13
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Title : Morten Kolseth
Source : wikipedia
Cat_value: 8
Loc_value: 1

Title : Nordland SV sier ja til OL i Tromsø | www.nordlys.no
Source : google
Cat_value: 7
Loc_value: 0

Title : 1.Div.Menn | iTromso.no
Source : bing
Cat_value: 7
Loc_value: 0

Title : 1.Div.Menn | iTromso.no
Source : bing
Cat_value: 7
Loc_value: 0

Title : Norwegen Adeccoligaen und tiefere Ligen 2009 - tippen4you ...
Source : bing
Cat_value: 7
Loc_value: 14

Title : Toppscorer'n 2008 | www.rb.no
Source : google
Cat_value: 6
Loc_value: 0

Title : Martin Knudsen (footballer)
Source : wikipedia
Cat_value: 6
Loc_value: 0

Title : altomfotball.no
Source : google
Cat_value: 5
Loc_value: 0

Title : Vålerenga-Tromsø - Eliteserien | Aftenposten.no
Source : google
Cat_value: 4
Loc_value: 0

Title : Lokalfotball.no - Jukser med kjøregodtgjørelser
Source : yahoo
Cat_value: 4
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Title : Jo Nymo Matland
Source : wikipedia
Cat_value: 4
Loc_value: 1

Title : Bladet Tromsø | iTromso.no
Source : yahoo
Cat_value: 3
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Title : Eliteserien | iTromso.no
Source : yahoo
Cat_value: 3
Loc_value: 0

Title : Krangel om finalen - Debattforum
Source : yahoo
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Title : Sigurd Rushfeldt
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Title : Morten Knutsen
Source : wikipedia
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Title : Rune Lange
Source : wikipedia
Cat_value: 3
Loc_value: 0

Title : Kampoppsett og resultater - idrett.speaker.no
Source : google
Cat_value: 2
Loc_value: 0

Title : Kvalifiserte til NM - iTromso
Source : yahoo
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Title : Nekten kostet 4.000 - iTromso
Source : yahoo
Cat_value: 2
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Title : Preview zápasu Tromsø IL - Vålerenga IF, pedzápasové informace
Source : yahoo
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Title : Tommy Knarvik
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Title : Espen Isaksen
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Title : 2004 Norwegian Football Cup
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Title : Morten Pedersen
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Title : Kjetil Norland
Source : wikipedia
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Title : Alejandro Lago
Source : wikipedia
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Title : List of top-division football clubs in UEFA countries
Source : wikipedia
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Title : Barten - Ekte lidelse har et navn.
Source : bing
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Title : Sigurica
Source : bing
Cat_value: 1
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Title : Sigurica
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Title : Canis nettbutikk - alt til hunden!
Source : bing
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Title : Runar Normann
Source : wikipedia
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Title :  yvind Svenning
Source : wikipedia
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Title : Terminliste Troms  IL 2008 - Radio Troms 
Source : google
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Title : Valerenga - Ham Kam < Tippeligaen < Norway < Matches < Football ...
Source : google
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Title : Paul Obiefule
Source : google
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Title : Tromsø
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Title : Aurelijus Skarbalius
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Wikiarticles:
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Title : Østerbro Stadion
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Title : Niels Bohr Institute
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Title : Department of Computer Science (University of Copenhagen)
 Distance : 0.6989
 Value : 0

Title : Rigshospitalet
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 Value : 0

Search articles:
 Title : F.C. Copenhagen - Wikipedia, the free encyclopedia
 Source : yahoo
 Cat_value: 19
 Loc_value: 68

Title : F.C. Copenhagen - FreeWikiMedia , the free encyclopedia
 Source : yahoo
 Cat_value: 19
 Loc_value: 69

Title : F.C. Copenhagen
 Source : wikipedia
 Cat_value: 19
 Loc_value: 67

Title : BrÅ,ndby IF
 Source : wikipedia
 Cat_value: 18
 Loc_value: 11

Title : collect-online | compare-prices-results |
 Source : bing
 Cat_value: 17
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Title : History of F.C. Copenhagen
 Source : wikipedia
 Cat_value: 17
 Loc_value: 19

Title : Basle v Bellinzona Live | Watch Live Football TV
 Source : google
 Cat_value: 11
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Title : Copenhagen football champions
 Source : wikipedia
 Cat_value: 11
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Title : Akademisk Boldklub
Source : wikipedia
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Title : Parken Stadium
Source : wikipedia
Cat_value: 10
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Title : Copenhagen Football Association
Source : wikipedia
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Title : Copenhagen Football Championship 1904-05
Source : wikipedia
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Title : Copenhagen Football Championship 1908-09
Source : wikipedia
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Title : Copenhagen Football Championship 1906-07
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Title : Copenhagen Football Championship 1907-08
Source : wikipedia
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Title : StÅ|vnet
Source : wikipedia
Cat_value: 6
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Title : Danish Superligaen 2007-2008 Table - statto.com
Source : google
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Title : Results Sunday 6th April 2008 - statto.com
Source : yahoo
Cat_value: 5
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Title : Copenhagen Football Championship 1911
Source : wikipedia
Cat_value: 5
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Title : Copenhagen Football Championship 1912
Source : wikipedia
Cat_value: 5
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Title : Livescore, Football Live Scores, Football Results, Soccer Live Scores ...
Source : yahoo
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Title : Finland Observer
Source : yahoo
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Title : Mobile Copenhagen
Source : bing
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Title : Copenhagen Cup
Source : wikipedia
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Loc_value: 3

Title : AMSTERDAMIZE | 100% Lycra-Free, Guaranteed
Source : google
Cat_value: 3
Loc_value: 2

Title : Portishead - Machine Gun (06-04-2008 19:58) - Rockland
Source : bing
Cat_value: 3
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Title : Rockland, Stig Nygaards hjemmeside - Weblog indeks
Source : bing
Cat_value: 3
Loc_value: 3

Title : F.C. Copenhagen season 2008-09
Source : wikipedia
Cat_value: 3
Loc_value: 67

Title : Randers - Odense : Statistiche calcio
Source : google
Cat_value: 1
Loc_value: 4

Title : Speakers Corner - Aalesunds Fotballklubb
Source : yahoo
Cat_value: 1
Loc_value: 3

Title : YouTube - GKS - Legia (06.04.2008)
Source : bing
Cat_value: 1
Loc_value: 1

Title : Letter: Threat to Snowdonia | Environment | The Guardian
Source : bing
Cat_value: 1
Loc_value: 1

Title : In And Around You: tnpsc.gov.in Recruitment Results 2008
Source : google
Cat_value: 0
Loc_value: 1

Title : Modifiyeli 3-Serisi > BMW > Modifiye Oto > Turkmod.com
Source : google
Cat_value: 0
Loc_value: 0

Title : Archive - Malta Tennis Federation
Source : google
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Title : - 93 " East Group " 2- " " ...
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Title : Bill Chameides
Source : yahoo
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Title : Cenk Uygur
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Title : Modifiyeli Corsa > OPEL > Modifiye Oto > Turkmod.com
Source : yahoo
Cat_value: 0
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Title : Earl Pomerantz
Source : bing
Cat_value: 0
Loc_value: 0

Title : Clinton's Aides Debate What to Do Next - Newsweek.com
 Source : bing
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Title : PRESS DOSSIER (*1963) 07.02-06.04.2008
 Source : google
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Title : Trade fairs calender 2008
 Source : google
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Title : www.sports-tipsters.co.uk
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 Category: Fotball
 Location: Oslo
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 Tags: iphone, oslo, norway, lyn, valerenga, football,

Wikiarticles:
 Title : Ullevaal Stadion
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Title : Berg videregående skole
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Search articles:
 Title : idrett.speaker.no
 Source : bing
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Title : TV 2 tilbake på søndagsbanen - firda.no
 Source : yahoo
 Cat_value: 23
 Loc_value: 2

Title : KlubbenOnline Frelsesarmeen Oslo Idrettslag
 Source : yahoo
 Cat_value: 22
 Loc_value: 54

Title : Tidlig julegave til Arsenal - auraavis.no
 Source : yahoo
 Cat_value: 16
 Loc_value: 1

Title : Sa nei til Brann | TV 2 Sporten | Fotball
 Source : bing
 Cat_value: 16
 Loc_value: 2

Title : Supporterne bryter avtale med NFF | www.lofot-tidende.no
 Source : yahoo
 Cat_value: 15
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Title : ByÅsen 2 - Kolstad 0-1
 Source : bing
 Cat_value: 15
 Loc_value: 1

Title : Supporterne bryter avtale med NFF - tk.no
 Source : yahoo
 Cat_value: 14
 Loc_value: 1

Title : Fotball - Årets lag: Premier League sesongen 08/09 | Oslo Sportslager

Source : yahoo
Cat_value: 13
Loc_value: 7

Title : Sesongen kan ryke | www.nordhordland.no
Source : yahoo
Cat_value: 13
Loc_value: 1

Title : Sport: Fotball - Spill - VG Nett Debatt
Source : google
Cat_value: 10
Loc_value: 1

Title : - Overrasket over den norske støtten - Premierleague - Dagbladet.no
Source : yahoo
Cat_value: 10
Loc_value: 5

Title : Norwegian Football Cup
Source : wikipedia
Cat_value: 10
Loc_value: 92

Title : - Hvorfor var treningen stengt? - Fotball - Dagbladet.no
Source : google
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Title : Hvorfor var treningen stengt? - Fotball - Dagbladet.no
Source : bing
Cat_value: 9
Loc_value: 7

Title : 1966 FIFA World Cup qualification (UEFA Å€" Group 3)
Source : wikipedia
Cat_value: 8
Loc_value: 6

Title : Brassene kommer | Aftenposten.no
Source : bing
Cat_value: 8
Loc_value: 2

Title : Norge-supporterterne bryter med NFF - Fotball - Dagbladet.no
Source : bing
Cat_value: 8
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Title : Local derby
Source : wikipedia
Cat_value: 8
Loc_value: 7

Title : RBKweb - View topic - Vålerengens IF
Source : google
Cat_value: 7
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Title : VÅlerenga Fotball
Source : wikipedia
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Title : Ullevaal Stadion
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Title : 1963 Norwegian Football Cup
Source : wikipedia
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Title : Liverpool-Vålerenga - P4 Radio Hele Norge
Source : google
Cat_value: 5
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Title : Liverpool-Vålerenga - P4 Radio Hele Norge
Source : yahoo
Cat_value: 5
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Title : Unnskyld, Bergen! | www.ba.no
Source : bing
Cat_value: 5
Loc_value: 0

Title : LÅrner tiltalt for overgrep | www.rb.no

Source : bing
Cat_value: 4
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Title : Manglerud Star Toppfotball
Source : wikipedia
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Title : 2010 Norwegian Premier League
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Title : Kjelsås Fotball
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Title : Aaron Chandler
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Title : Vegar Gjermundstad
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Title : Skeid Fotball
Source : wikipedia
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Title : Melodi Grand Prix Junior 2006
Source : wikipedia
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Title : Komplet.no Arena
Source : wikipedia
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Title : Espen Isaksen
Source : wikipedia
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Loc_value: 2

Title : Watch SK Brann Bergen v Viking Stavanger Live | Watch Live Football TV
Source : google
Cat_value: 2
Loc_value: 6

Title : Moods får ikke holde avslutningsshowet - Kjendis.no
Source : google
Cat_value: 2
Loc_value: 18

Title : Mann pågrepet etter knivstikking i Oslo - Innenriks - Dagbladet.no
Source : yahoo
Cat_value: 2
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Title : List of top-division football clubs in UEFA countries
Source : wikipedia
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Title : Vålerenga
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Title : Grefsen stadion
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Title : Oslo
Source : wikipedia
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Loc_value: 213

Title : Valerenga Oslo vs Liverpool (1-4) Friendly 05.08.2008 ...
Source : google
Cat_value: 0
Loc_value: 3

Title : Murmansk wreck to be raised - Aftenposten - News in English ...

Source : google
 Cat_value: 0
 Loc_value: 3

Title : Nye bøker i Etnografisk bibliotek juli 2008
 Source : google
 Cat_value: 0
 Loc_value: 35

Title : Søk i Oslo kommune - Bystyret - Oslo kommune
 Source : google
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Title : Meninger - FÅ|rÅ.vik - Aftenposten.no
 Source : bing
 Cat_value: 0
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Title : Sliter med Å¥ innfri psykiatrigaranti- Nyheter - Innenriks ...
 Source : bing
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Title : FC Lyn Oslo
 Source : wikipedia
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 Tags:

Wikiarticles:
 Title : Tromsøya
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Search articles:
 Title : Origo.no : Finn soner
 Source : bing
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Title : Overrasket alle - iTromso
 Source : bing
 Cat_value: 4
 Loc_value: 1

Title : YouTube - Alexander rybak In Tromso,Norway
 Source : google
 Cat_value: 3
 Loc_value: 7

Title : NRK.no - Troms
 Source : bing
 Cat_value: 3
 Loc_value: 7

Title : Tromsø By | Hva skjer i Tromsø
 Source : google
 Cat_value: 2
 Loc_value: 0

Title : Tromsø By | Hva skjer i Tromsø
 Source : yahoo
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Title : Riddu RiÅ'Å'u - Internasjonal urfolksfestival
 Source : bing
 Cat_value: 2
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Title : Idol-band til Tromsø - iTromso
 Source : yahoo
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Title : Tilbake til Tromsø - iTromso
 Source : yahoo

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Title : Pinsekirken TromsÅ.,: Arkivsaker 2008 og eldre
Source : bing
Cat_value: 1
Loc_value: 0

Title : MySpace - Annis - 24 - Female - TromsÅ., NO - myspace.com/aalekvinnen ...
Source : bing
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Title : Å~yvind Sandberg
Source : wikipedia
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Title : Midnight concert Tromsø - hurtigruten.com
Source : google
Cat_value: 0
Loc_value: 0

Title : Midnight concert Tromsø - Hurtigruten UK
Source : google
Cat_value: 0
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Title : Midnight concert in the Arctic Cathedral (Tromsø) - Hurtigruten US
Source : google
Cat_value: 0
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Title : Top of the World International Piano Competition - Tromsø June 14 ...
Source : google
Cat_value: 0
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Title : Tromsø Salsa klubb - Dans i Tromsø
Source : google
Cat_value: 0
Loc_value: 0

Title : Bukta Tromsø Open Air Festival - Wikipedia, the free encyclopedia
Source : google
Cat_value: 0
Loc_value: 0

Title : Earth Affair - The Nelson Mandela Tromso Concert
Source : google
Cat_value: 0
Loc_value: 3

Title : Tromsø By - Nord-Norges største kulturnettsted
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : Hjem
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : Tromsø Salsa klubb - Dans i Tromsø
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : Studenthuset driv | Facebook
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : Nordnorsk Opera og Symfoniorkester | Facebook
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : AMI Hotel TromsÅ., | Facebook
Source : bing
Cat_value: 0
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Title : Hjem
Source : bing
Cat_value: 0
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Title : Nordnorsk Opera og Symfoniorkester | Facebook
Source : bing

Cat_value: 0
Loc_value: 0

Title : Links on "Buktafestivalen" | Facebook
Source : bing
Cat_value: 0
Loc_value: 0

Title : MIC Norway: Nelson Mandela to visit Tromsø benefit concert
Source : google
Cat_value: -1
Loc_value: -1

Title : Periodicos.com.ar Nordlys - Tromso - Troms - Norway - World's ...
Source : yahoo
Cat_value: -1
Loc_value: -1

Title : Periodicos.com.ar NRK Troms - Tromso - Troms - Norway - World's ...
Source : yahoo
Cat_value: -1
Loc_value: -1

ID : 27
Filename: 27_u2_valle_hovin.jpg
Date : 27.07.2005 21:08:03
Category: Konsert
Location: Oslo
Country : Norway
Temp : 16.0
ICAO : ENGM
Tags: oslo, kern, 500andup, aerialphoto, norway, architecture, oslo, concert, valle, helsfyr, arena, acdc,

Wikiarticles:

Search articles:
Title : The World's Best Photos of konsert and norway - Flickr Hive Mind
Source : google
Cat_value: 29
Loc_value: 16

Title : Oslo Lufthavn - Arrangementkalender 2009
Source : bing
Cat_value: 26
Loc_value: 122

Title : Javid Sharif Konsert I Oslo - Afghan Forums
Source : google
Cat_value: 24
Loc_value: 29

Title : www.konsertsonen.no : Finn bidrag
Source : yahoo
Cat_value: 21
Loc_value: 10

Title : Konsert
Source : bing
Cat_value: 17
Loc_value: 4

Title : Konsert
Source : bing
Cat_value: 13
Loc_value: 5

Title : Utelivsguiden
Source : bing
Cat_value: 6
Loc_value: 12

Title : __ Norway
Source : yahoo
Cat_value: 5
Loc_value: 4

Title : Garage Oslo
Source : yahoo
Cat_value: 4
Loc_value: 6

Title : DumDum Boys Concert Setlist Dyvekes bro, Oslo, Norway 2009 ...
Source : google
Cat_value: 3
Loc_value: 11

Title : Oslo Spektrum - konserter, messer og andre arrangementer ...

Source : google
Cat_value: 3
Loc_value: 11

Title : Kalender.oslokulturnatt.no : Finn bidrag
Source : yahoo
Cat_value: 3
Loc_value: 23

Title : List of concert halls
Source : wikipedia
Cat_value: 3
Loc_value: 3

Title : Madonna konsert! - Trip plan to Oslo, Norway - 7319 - TravelMuse
Source : google
Cat_value: 2
Loc_value: 6

Title : Ylvis
Source : wikipedia
Cat_value: 2
Loc_value: 1

Title : Lørdagsgodt: Gratis konsert - Official Travel & Visitor's Guide to ...
Source : google
Cat_value: 1
Loc_value: 14

Title : Hva skjer i Oslo? - Official Travel & Visitor's Guide to Oslo, Norway ...
Source : bing
Cat_value: 1
Loc_value: 26

Title : tenThing Brassensemble Å» Live
Source : bing
Cat_value: 1
Loc_value: 0

Title : Oslo Å, st - fra arbeiderstrÅ,k til ungt og trendy miljÅ, - Official ...
Source : bing
Cat_value: 1
Loc_value: 37

Title : Nasjonalbiblioteket || index
Source : bing
Cat_value: 1
Loc_value: 2

Title : ObZen Tour
Source : wikipedia
Cat_value: 1
Loc_value: 1

Title : Peter Herresthal
Source : wikipedia
Cat_value: 1
Loc_value: 1

Title : Oslo Konserthus[www.oslokonserthus.no]
Source : google
Cat_value: 0
Loc_value: 5

Title : Yes konsert 11 desember Sentrum Scene Oslo (Norway)
Source : google
Cat_value: 0
Loc_value: 0

Title : Din Konsert - Norway | Facebook
Source : google
Cat_value: 0
Loc_value: 0

Title : Oslo Konserthus[www.oslokonserthus.no]
Source : yahoo
Cat_value: 0
Loc_value: 5

Title : Hjem
Source : yahoo
Cat_value: 0
Loc_value: 11

Title : VisitOSLO.com - Offisiell reiseguide for Oslo Norge - Official Travel ...
Source : yahoo
Cat_value: 0
Loc_value: 41

Title : Norway - Sweden - Oslo Spektrum

Source : yahoo
 Cat_value: 0
 Loc_value: 1

Title : Rockefeller Music Hall - John Dee Live Club & Pub - Sentrum Scene
 Source : yahoo
 Cat_value: 0
 Loc_value: 0

Title : by:Larm
 Source : bing
 Cat_value: 0
 Loc_value: 36

Title : Oslo Konserthus[www.oslokonserthus.no]
 Source : bing
 Cat_value: 0
 Loc_value: 3

Title : Manhattan Skyline
 Source : wikipedia
 Cat_value: 0
 Loc_value: 4

Title : Video results for Oslo Konsert Norway
 Source : google
 Cat_value: -1
 Loc_value: -1

Title : Blitz
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

 ID : 28
 Filename: 28_muse_stockholm.jpg
 Date : 24.10.2009 20:56:17
 Category: Concert
 Location: GubbÅrngen
 Country : Sweden
 Temp : 7
 ICAO : ESKB
 Tags: stockholm, globen, sweden, arena, hockey, penguins,

Wikiarticles:
 Title : Stockholm Globe Arena
 Distance : 0.0473
 Value : 0

Title : Hovet
 Distance : 0.1526
 Value : 0

Title : Söderstadion
 Distance : 0.2594
 Value : 0

Title : Gullmarsplan
 Distance : 0.5668
 Value : 0

Search articles:

 ID : 29
 Filename: 29_u2_barcelona.jpg
 Date : 30.06.2009 21:21:17
 Category: Concert
 Location: Barcelona
 Country : Spain
 Temp : 27.0
 ICAO : LELL
 Tags: barcelona, campnou, catalunya, fcbarcelona, barÅsa, futbol,

Wikiarticles:
 Title : Camp Nou
 Distance : 0.0232
 Value : 1

Title : Palau Blaugrana
 Distance : 0.2496
 Value : 0

Title : Mini Estadi
 Distance : 0.4129
 Value : 0

Search articles:

Title : U2 360° Tour
 Source : wikipedia
 Cat_value: 30
 Loc_value: 8

Title : U2 Concert Tickets | Watch Videos | U2 360° Tour - Breath (Concert ...
 Source : google
 Cat_value: 24
 Loc_value: 1

Title : Palau de la M sica Catalana
 Source : wikipedia
 Cat_value: 17
 Loc_value: 32

Title : Mind-Warp PaVilion :: Community :: Torrent Announce: U2 260°-Tour ...
 Source : yahoo
 Cat_value: 13
 Loc_value: 20

Title : Barcelona apartments, Barcelona Hotels,: Barcelona Summer Events 2009 ...
 Source : yahoo
 Cat_value: 12
 Loc_value: 63

Title : U2 260°-Tour opening concert: Barcelona/Nou Camp Stadium 2009-06 ...
 Source : google
 Cat_value: 8
 Loc_value: 6

Title : David Gim nez Carreras
 Source : wikipedia
 Cat_value: 8
 Loc_value: 3

Title : Video - Shockwaves NME Awards 2010 - Tickets, Previous Winners ...
 Source : bing
 Cat_value: 7
 Loc_value: 76

Title : YouTube - U2 360° Tour - Breath (Concert Opening) - 30.06.2009 - Barcelona
 Source : yahoo
 Cat_value: 6
 Loc_value: 17

Title : YouTube - U2 360  Tour - Breath (Concert Opening) - 30.06.2009 ...
 Source : bing
 Cat_value: 6
 Loc_value: 17

Title : Tour of the Universe (Depeche Mode tour)
 Source : wikipedia
 Cat_value: 6
 Loc_value: 5

Title : Foreign Affair Tour
 Source : wikipedia
 Cat_value: 6
 Loc_value: 7

Title : Daniel Zuera
 Source : wikipedia
 Cat_value: 6
 Loc_value: 13

Title : U2 Barcelona Concert Tickets
 Source : google
 Cat_value: 5
 Loc_value: 18

Title : Barcelona City Tourist Guide 2009 - U2 concert Barcelona 30 June 2009
 Source : google
 Cat_value: 5
 Loc_value: 47

Title : U2 Barcelona Concert Tickets
 Source : yahoo
 Cat_value: 5
 Loc_value: 20

Title : Live in Barcelona
 Source : wikipedia
 Cat_value: 5
 Loc_value: 7

Title : Devotional Tour
 Source : wikipedia
 Cat_value: 5

Loc_value: 2

Title : Liceu
Source : wikipedia
Cat_value: 5
Loc_value: 50

Title : Tickets U2 Barcelona Concert
Source : google
Cat_value: 4
Loc_value: 16

Title : List of theatres and concert halls in Barcelona
Source : wikipedia
Cat_value: 4
Loc_value: 8

Title : YouTube - U2 360 30.06 2009 Barcelona Ultraviolet (HD)
Source : google
Cat_value: 3
Loc_value: 19

Title : Video - U2 360 tour 30.06 2009 Barcelona 10 - Unforgettable Fire ...
Source : google
Cat_value: 3
Loc_value: 26

Title : YouTube - U2 360 30.06 2009 Barcelona Ultraviolet (HD)
Source : yahoo
Cat_value: 3
Loc_value: 19

Title : Vídeo U2 360 30.06 2009 Barcelona Ultraviolet (HD) en VIDEOS.es
Source : yahoo
Cat_value: 3
Loc_value: 26

Title : L'Auditori
Source : wikipedia
Cat_value: 3
Loc_value: 5

Title : Palau Robert
Source : wikipedia
Cat_value: 3
Loc_value: 20

Title : Live in Barcelona (Elton John DVD)
Source : wikipedia
Cat_value: 3
Loc_value: 4

Title : Barcelona - U2 Community Group -
Source : bing
Cat_value: 2
Loc_value: 10

Title : Barcelona
Source : wikipedia
Cat_value: 2
Loc_value: 217

Title : Regino Sainz de la Maza
Source : wikipedia
Cat_value: 2
Loc_value: 2

Title : Culture of Barcelona
Source : wikipedia
Cat_value: 2
Loc_value: 31

Title : Nancy Fabiola Herrera
Source : wikipedia
Cat_value: 2
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Title : U2 360 30.06 2009 Barcelona Ultraviolet (hd)
Source : google
Cat_value: 1
Loc_value: 19

Title : U2 Barcelona Concert Tickets
Source : google
Cat_value: 1
Loc_value: 11

Title : U2 Barcelona Concert Tickets
Source : yahoo
Cat_value: 1

Loc_value: 12

Title : U2//Fanclub Nederland - U2 360 tour 30.06 2009 Barcelona 01 Breathe (HD)
 Source : yahoo
 Cat_value: 1
 Loc_value: 21

Title : Moby Dixie
 Source : bing
 Cat_value: 1
 Loc_value: 16

Title : U2//Fanclub Nederland - Video's
 Source : bing
 Cat_value: 1
 Loc_value: 21

Title : nin.com - NIN Berlin Concert 30 06 2009 Metal
 Source : bing
 Cat_value: 1
 Loc_value: 4

Title : Centre de Cultura Contemporà nia de Barcelona
 Source : wikipedia
 Cat_value: 1
 Loc_value: 26

Title : La Tawa (album)
 Source : wikipedia
 Cat_value: 1
 Loc_value: 1

Title : Javier Perianes
 Source : wikipedia
 Cat_value: 1
 Loc_value: 2

Title : Musiknyheter.no
 Source : yahoo
 Cat_value: 0
 Loc_value: 2

Title : YouTube - U2 360 tour 30.06 2009 Barcelona 10 - Unforgettable Fire ...
 Source : bing
 Cat_value: 0
 Loc_value: 14

Title : Links on "U2 360 Barcelona (The Claw) pictures & videos" | Facebook
 Source : bing
 Cat_value: 0
 Loc_value: 0

Title : Video results for Barcelona Concert 30.06.2009
 Source : google
 Cat_value: -1
 Loc_value: -1

Title : YouTube - U2 Barcelona 2009-06-30 Ultra Violet - Webzzle Explorer
 Source : yahoo
 Cat_value: -1
 Loc_value: -1

Title : Turisme de Barcelona
 Source : bing
 Cat_value: -1
 Loc_value: -1

Title : Low Cost
 Source : bing
 Cat_value: -1
 Loc_value: -1

 ID : 30
 Filename: 30_bruce_springsteen_los_angeles.jpg
 Date : 16.04.2009 21:21:17
 Category: Concert
 Location: Los Angeles
 Country : United States
 Temp : 12.2
 ICAO : KSMO
 Tags: losangeles, california, team, beverlyhills, robot, robotics,

Wikiarticles:
 Title : Los Angeles Memorial Coliseum
 Distance : 0.2883
 Value : 0

Title : University of Southern California
 Distance : 0.8095

Value : 0

Search articles:

Title : EMIC
Source : bing
Cat_value: 96
Loc_value: 0

Title : The Prodigy - ProdigyAnt site - www.TheProdigy.pl
Source : google
Cat_value: 51
Loc_value: 0

Title : Walt Disney Concert Hall
Source : wikipedia
Cat_value: 40
Loc_value: 0

Title : Los Angeles Philharmonic
Source : wikipedia
Cat_value: 20
Loc_value: 0

Title : APA - Hadise's concert will not be organized in Azerbaijan any more
Source : bing
Cat_value: 18
Loc_value: 0

Title : So Music | Jeu Concours
Source : bing
Cat_value: 15
Loc_value: 0

Title : Epik High - Map The Soul - themes - KoME U.S.A.
Source : google
Cat_value: 14
Loc_value: 0

Title : Los Angeles Music Center
Source : wikipedia
Cat_value: 14
Loc_value: 0

Title : Advanced Search
Source : google
Cat_value: 11
Loc_value: 0

Title : Radio 4 - radio 4 - Zoek in www.radio4.nl - Klassiek leeft op 4 - Tag ...
Source : yahoo
Cat_value: 10
Loc_value: 0

Title : Esa-Pekka Salonen
Source : wikipedia
Cat_value: 7
Loc_value: 0

Title : los | most popular | Mister Wong
Source : google
Cat_value: 6
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Title : Press release: Arvo Pärt's Symphony No - Estemb in Helsinki
Source : google
Cat_value: 6
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Title : angeles | most popular | Mister Wong
Source : yahoo
Cat_value: 6
Loc_value: 0

Title : Estemb in Helsinki
Source : bing
Cat_value: 6
Loc_value: 0

Title : Radio Swiss Jazz - Michael Tilson Thomas - Biography
Source : bing
Cat_value: 5
Loc_value: 0

Title : angeles | most popular | Mister Wong
Source : google
Cat_value: 4
Loc_value: 0

Title : Ustvol'skaya Concert in Los Angeles | Sikorski Music Publishers

Source : yahoo
Cat_value: 4
Loc_value: 0

Title : Downtown Los Angeles
Source : wikipedia
Cat_value: 4
Loc_value: 0

Title : The Forum (Inglewood, California)
Source : wikipedia
Cat_value: 4
Loc_value: 0

Title : Dorothy Chandler Pavilion
Source : wikipedia
Cat_value: 4
Loc_value: 0

Title : Los Angeles County, California
Source : wikipedia
Cat_value: 3
Loc_value: 0

Title : Rose Bowl (stadium)
Source : wikipedia
Cat_value: 3
Loc_value: 0

Title : John Gorka
Source : google
Cat_value: 2
Loc_value: 0

Title : JAZZ IN OSLO
Source : yahoo
Cat_value: 2
Loc_value: 0

Title : Music News, Photos, Gig Tickets, Videos, Forum, Reviews, Features ...
Source : bing
Cat_value: 2
Loc_value: 0

Title : Areto zinematografikoetan publikoki erakusteko kalifikatutako filmak
Source : bing
Cat_value: 2
Loc_value: 0

Title : Staples Center
Source : wikipedia
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Title : Los Angeles
Source : wikipedia
Cat_value: 2
Loc_value: 0

Title : Los Angeles Master Chorale
Source : wikipedia
Cat_value: 2
Loc_value: 0

Title : Samler Harrison-låter - r-a.no
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : TSITALIA: LOS ANGELES SETLIST 15.04.2009
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : Ovetsjkin best igjen | TV 2 Sporten
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : lakers | most popular | Mister Wong
Source : yahoo
Cat_value: 1
Loc_value: 0

Title : Hospitalisation - LePost.fr
Source : bing
Cat_value: 1
Loc_value: 0

Title : Los Angeles International Airport

Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Wilmington, Los Angeles, California
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Loyola Marymount University
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Greater Los Angeles Area
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Music of California
Source : wikipedia
Cat_value: 1
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Title : Museum of Contemporary Art, Los Angeles
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Paul Salamunovich
Source : wikipedia
Cat_value: 1
Loc_value: 0

Title : Concerts in Los Angeles | Los Angeles Concerts
Source : google
Cat_value: 0
Loc_value: 0

Title : CHILDREN OF BODOM: Setlist From US Tour Revealed, Video Footage Of ...
Source : google
Cat_value: 0
Loc_value: 0

Title : Los Angeles Events: Los Angeles Concerts, Shows & more - CA - AOL ...
Source : google
Cat_value: 0
Loc_value: 0

Title : Mark Webber at Weblo Celebrities
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : Guy Thompson at Weblo Celebrities
Source : yahoo
Cat_value: 0
Loc_value: 0

Title : LA Weekly
Source : wikipedia
Cat_value: 0
Loc_value: 0

Title : free-zg.t-com.hr
Source : bing
Cat_value: -1
Loc_value: -1

Title : ChesterNovello
Source : bing
Cat_value: -1
Loc_value: -1