Software Engineering for Geoinformatics

Implementation Plan

Web-based Visualization of Attraction Points of Milan

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Goal

The aim of the project is to locate the major tourist attractions of Milano and its description for the users, by providing a useful visualization and analysis tools in a desktop web-based application interface, using Google Maps or Open Street Maps.

Objective

The main objective of the project to implement the knowledge of software engineering to design a webpage that is useful for the people who face problems in finding a tourist location in Milano.

Success Criteria

The Project success is solely depending on the project is managed while delivering on its goals and objectives.
Project's success can be managed by:

- Scope: To make understand the user how to use the webpage for finding his/her point of interests easily.
- Schedule: Meeting the deadlines
- Team Satisfaction: Make sure that team is satisfied with the project.
- User Satisfaction: Get positive feedback from the users.
- Quality: To reach the expectations of project's functionality planned at the beginnig.

Scope Statement

This Implementation is concerning about providing information to users about using the website and to let them have access to sample datasets of our interest, contribute on data collection and data validation, and to make custom visualization on these data and get used of some analysis tools offered by a **desktop web- based application**.

The web-application will offer maps of dataset with the ability of the manipulation of the data and to add comment to database. Also, the web-application will allow user to access and find information about coordinate regarding to dataset analysis to be displayed as points (To that user).

Resource Plan

To achieve the goal and objectives of this project we must have these applications installed in your system that are compatible with Mac or Windows

- Python (version no less than 3.7)
- PostgreSQL/Pgadmin 4
- Anaconda (Required IDEs such as Spyder,VS Code etc.)
- GitHub
- HTML/CSS/JS

Python

We are using Python programming language and Flask microframework for implementing the backbone structure of the webpage. It includes the various built-in functions for specific use conclude a single purpose. You must include these libraries for visualizing all the features. Project's requirements are as following,

-branca
-Flask
-Flask_Bcrypt
-Flask_Login
-Flask_SQLAlchemy
-Flask_WTF
-folium
-fontawesome
-geopandas
-pandas
-psycopg2
-psycopg2_binary
-SQLAlchemy
-Werkzeug
-WTForms

Pgadmin 4

Pgadmin4 is used to create a database and to link with the program. The major roles of this software are:

- It contains the information of required data such as tourist attraction points, user credentials etc.
- To store the updated information by the user.
- To store the personal details of the user like password, username, etc.
- It sends the data to the web whenever it is requested by the user.

GitHub

GitHub is a code hosting platform for version control and collaboration. Hence, the overall code can be found by clicking on this link:

hakankinikli/SE4GI: Software Engineering Course Project repository (github.com)

Geopandas

GeoPandas is a module which enables users to easily do geospatial operations on geospatial data in Python. It is used for visualizing and manipulating the data in a specific format concerning to our area of interest. It can be used for plotting graphs or to show data in the form of tables.

Risk Analysis

Positive	Negative
Strength • The Geopandas is working efficiently. • Flask libraries are useful for adding design features to the webpage. • The website is working properly.	**Weakness** • Various filtering of data is yet to be implemented. • The storage of user data is the database shows an error sometimes. • An error can be obtained while registering. • The website still needs a well orientation of user interface.
Opportunities • The user can easily access the maps even without login. • User can edit the data by registering. • The user can visualize the information regarding his/her point of interest.	**Threats** • User entering false information about the locations. • Data edited by the user must be monitored.

Implementation of Timeline

- General overview of the project: Introducing the main purpose of the project.
- Requirement Analysis and Specification Document: This includes the requirements of the project as per our specific purpose and the specifications needed to work on it.
- Design and Test plan document: It describes the layout of the webpage to be designed. It consists of the test cases that are to be tested for the execution of the project.
- Final updated documents: It is final document which mentions all the updated details of the work.

Team Roles and Responsibilities

The project is implemented by two members under the guidance of **Prof Elisabetta Di Nitto** and **Prof Daniele Oxoli.**

Key Roles

Project Member: Each person of the group working to help users find their way to the desired location of interest.

Guide: A senior faculty who helps or guides the project members to solve the issues that occur during the work.

Responsibilities

Guide: Guide make sure that the overall model is working properly as per the requirement fulfilling the basic purpose of the project and guide the members of the project to reach the expected goals and objectives.

Members: The members investigate the purpose of the project and deliver the software conveying the message of the project. The Role of members which are to be followed:

- To write a python script for registering, logging, and visualizing data from the database.
- Html code is to be used for designing the web interface like the general layout, account page, login page, etc.

- Using Pgadmin4 database must be created and linked to the program.
- This database consists of the information of the tourist location of Milano and used for storing the data updated by the users.
- To ensure that user finds the desired location without any difficulty.
- To analyze the data entered by the user and to edit if necessary.
- Make sure that the purpose of the project is reached.

References

- Outscraper/extract-data-from-google-maps
- Epicollect5 - Free and easy-to-use mobile data-gathering platform.
- Lecture notes of SE4G
- Leaflet - a JavaScript library for interactive maps (leafletjs.com)
- folium · PyPI