CSE 586 Distributed Systems

Project 1

My Waypoints

Project Report


Submitted By

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Introduction:

This project aims to create a distributed web application called My Waypoints to augment the information about the travel routes, that is provided by typical map applications. The web application will augment the travel route information by displaying weather at the starting point and the destination as well as, at the towns and cities along the route. Finally, the route and the weather details will be displayed in a user friendly way. Along with showing the route between any two cities on the map the web application will also show the route details. For example, how much distance to travel on a particular road and where to turn.

The figure below shows a diagrammatic representation of the web application stack:
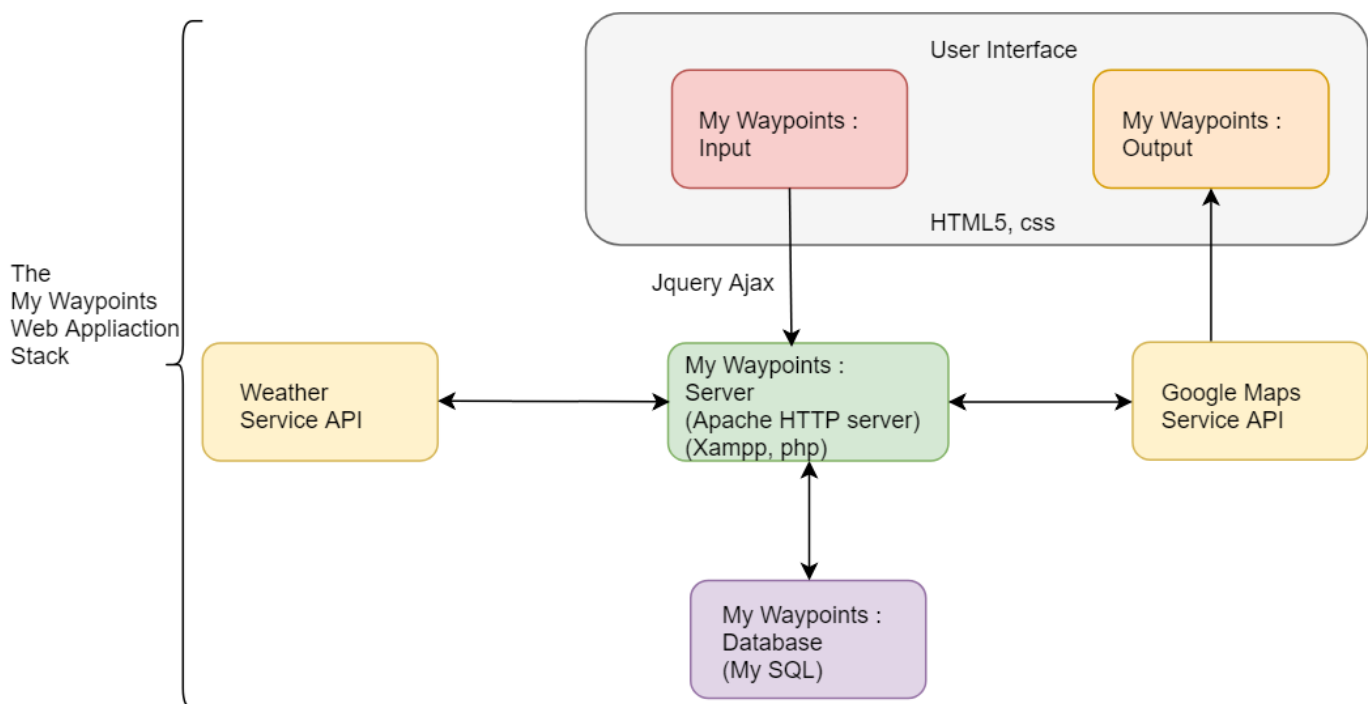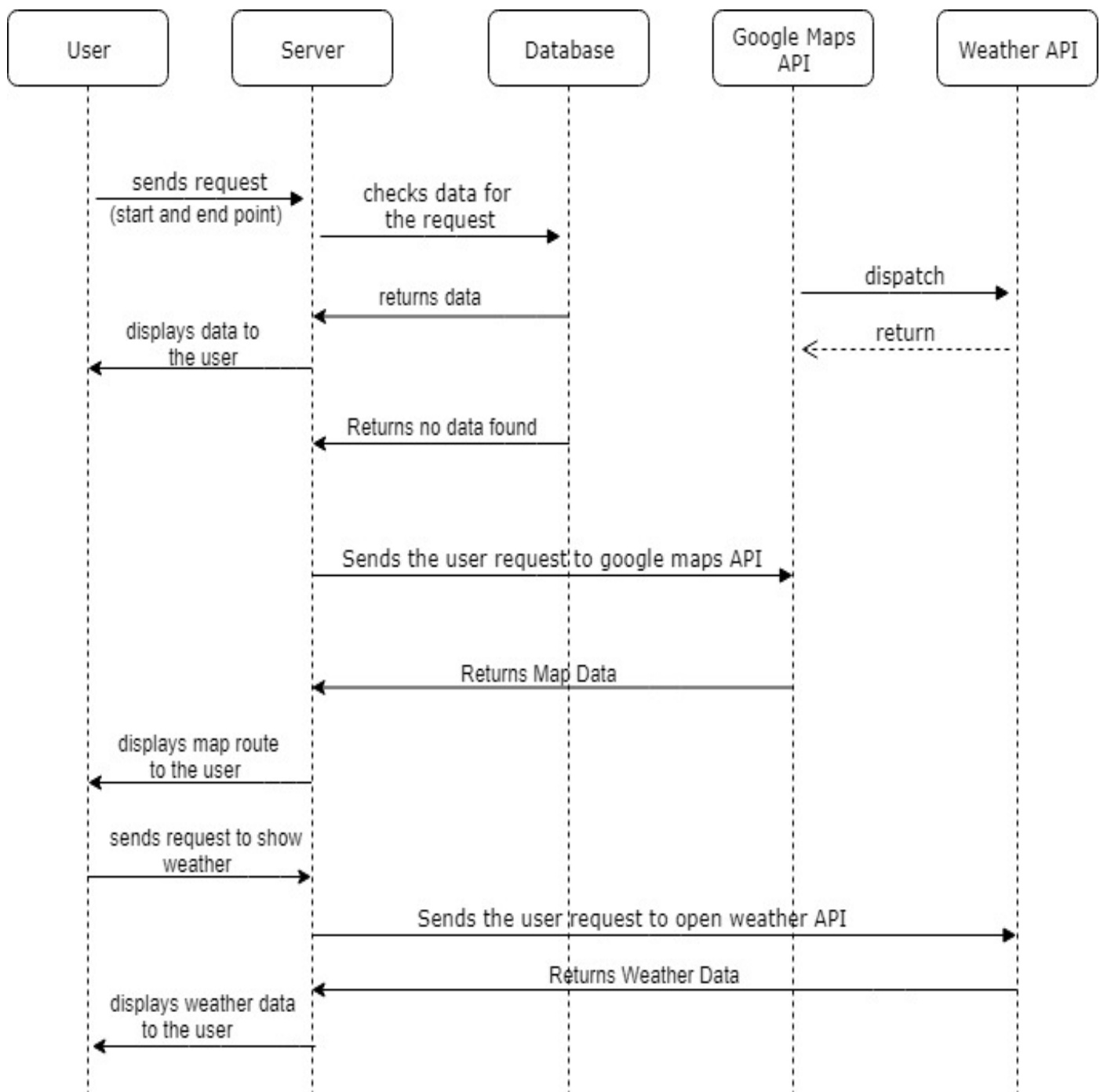

The Web Application Stack:

The application stack for the project would be: The client side would use HTML5 and css. Html is a standard markup language that is used for creating web pages. Cascading style sheets (CSS) describes the way HTML pages are displayed on the screen. The server side would use the Apache HTTP server (Xampp/php). Apache HTTP server is the most popular open source web server. The Database used would be MySQL. My SQL is an open source SQL Database Management System The database fetch and update will be done using php and jquery ajax to make the application real-time. Php is a scripting language that is suitable

for web development and it can also be embedded into HTML.The google maps service API and whether service API would be used for providing maps and weather data to My Waypoints server. Google Maps API is a set of method and tools that allows you to display maps in your website. Open weather API is a free weather API from OpenWeatherMap, that is used to access current weather.

The Process flow of The Distributed Web Application:

The figure shown below is the process flow diagram of my waypoints application:

The explanation for the process flow diagram:

The user sends a request to the web application server (Apache HTTP server) by entering the start and the end city. The server sends a request to my sql database to check if the requested data is already available in the database. The database returns data to the server or a response that no data is found. The the requested route is found, the server sends it to the front end and it is displayed to the user. If no data is found in the database, the server sends a request to google maps API. The maps API returns the requested route. The server sends the route data to the front end and it is displayed on the map. The user then sends a request to the server to display the weather. The server forwards the same request to the open weather API. The weather API returns weather data to the server and the server sends the weather data to be displayed on the front end user interface.

Discussion on the choice of Technologies:

- **HTML5**

  The reason for choosing html is its most amazing feature that is semantics. It is a set of new tags that make your code meaningful and your website more good looking. The new tags like <aside> and <nav> makes HTML more meaningful.

- **CSS**

  The reason for using CSS (Cascading Style Sheets) for designing the front end is that CSS allows us to separate the content from the presentation layer. By using CSS the HTML page size is smaller and hence it can load faster.

- **Jquery Ajax**

  The main reason for using Jquery Ajax is that it increases performance and speed. It also reduces the traffic load between the client and the server.

- **Apache HTTP server**

  The main reason for using the Apache HTTP server is that it is open source. The software includes an administrative control panel. Also, there are other features that are included in the installation package like Simple Mail Transfer Protocol (SMTP).

- **PHP**

  The main reason for using PHP is its high speed as compared to other scripting languages. Also, php websites are easy to maintain and update.

- **My SQL**

  The flexiability of using open source software is the main reason for using my sql database. Scalability is another reason for using my sql database.

Reasons for using Xampp for development:

- You can easily start and stop the web server and database stack with on click.

- It is possible to do your database operations easily.

- It is easy to install as compared to other web servers like WAMP.

- It comes with a module for phpmyadmin.

Comaprison of version 1 and version 2 of the project:

The version 1 of the My waypoints web application does not have my sql database whereas version 2 has my sql database.

The advantages of My waypoints version 2 over version 1 are:

- Now a days every business focuses on data analytics for expanding their business and to deliver better services. The version 2 of my waypoints web application will help in the downstream data analytics. It would help to increase the number of users using the application.

- My waypoints version 2 can help to gather client data, that can be used in research related to weather.

- A web application with a database increases the efficiency and performance of the web application and increases the speed for fetching the result.

- The web application with a database helps to reduce number of hits to the Google maps and weather API. This in turn saver cost paid to the API provider.

UI Details:

The My waypoints UI are shown in the figure below:
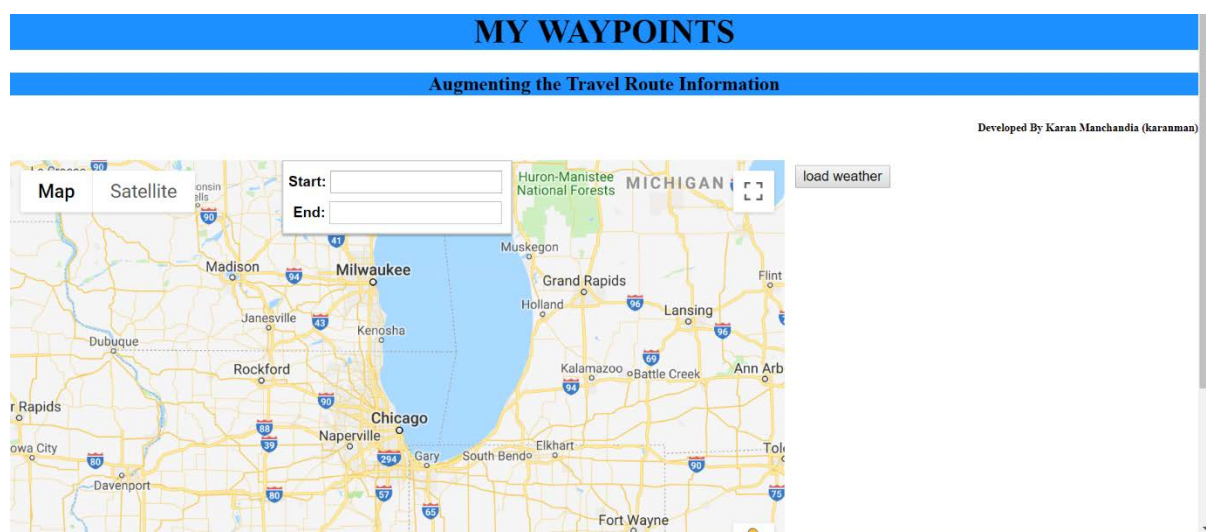
As the user enters the start and the end city name and press enter, the route along with the direction details are displayed. The screenshots are displayed below.
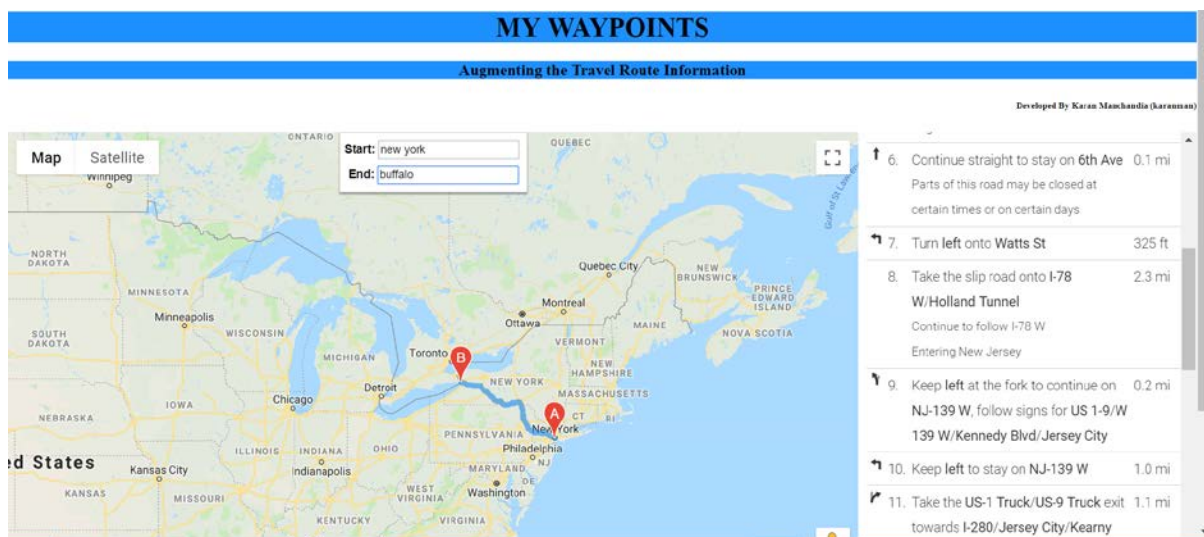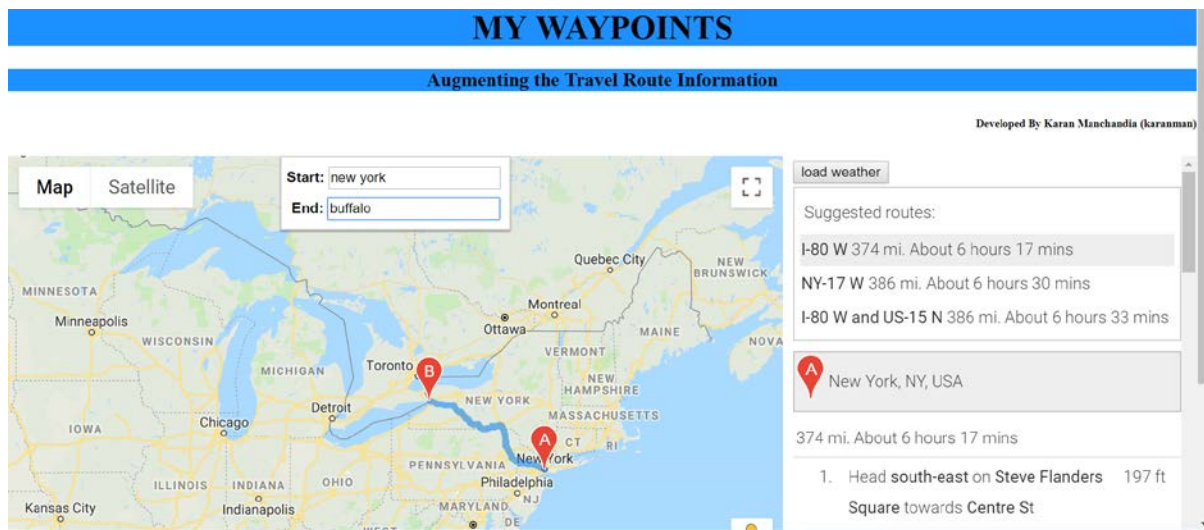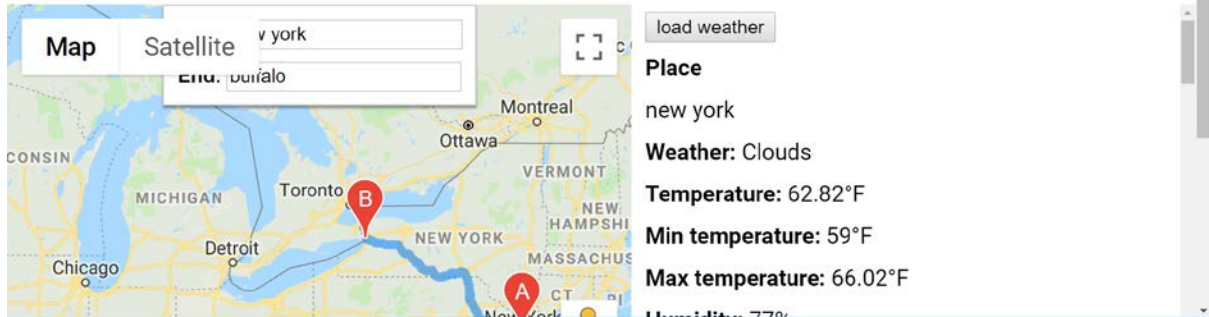

As the user clicks on the load weather button, present at the top of the right tab, the weather is displayed in the screen. It is shown in the screenshot below.

References

- https://www.w3schools.com/graphics/google_maps_intro.asp

- https://developers.google.com/maps/web-services/client-library

- https://openweathermap.org/api

- https://www.w3schools.com/xml/ajax_php.asp

- https://openweathermap.org/examples