

CSCI 4131 – Internet Programming

Homework Assignment 3

Posted February 3rd (Version 2, Update Feb 7th)

Due Date: Friday Feb 16th at 11:55 pm

Late Submission (with penalty) Deadline: Saturday, Feb 17th at 11:55 am.

1 Description

The objective of this assignment is to develop your JavaScript skills, introduce you to ‘Google Maps JavaScript API’, ‘Google Places JavaScript library’, ‘Google Maps Directions Service’, and geolocation. While the Google Maps API will be introduced in subsequent lectures, developing and/or bolstering the ability to read library documentation and then use it to develop functionality is an essential skill for today's web developer. New libraries with new APIs are introduced, and existing libraries and their APIs are updated, on a regular basis. Teaching a specific API is counterproductive in such an environment. Instead, one of the objectives of this assignment is to motivate you to develop and/or bolster your skills to learn and use new libraries and APIs. This assignment specification has 8 pages.

For this assignment, you will embed google map to the already developed functionality for homework 2. You will write code to dynamically mark your favorite places on the embedded google map. You will develop additional functionality to search for specific places near your current location. In addition to this, you will be asked to calculate directions and display route between your current location and destination using various modes of transportation.

2 Preparation/Reference

2.1 Google API Setup

A small amount of setup is required to use the Maps API – you need to get your API key. Google provides an excellent tutorial for obtaining your API key and setting up your map, and it is recommended to complete the tutorial. The tutorial can be found at the following link:

<https://developers.google.com/maps/documentation/javascript/tutorial>

When signing up for your API key, use your UMN x500 account. You are not required to have a separate Google account for this course.

2.2 Google Places JavaScript Library Reference

You can refer the following link to obtain more information about places library:

<https://developers.google.com/maps/documentation/javascript/places>

2.3 Google Maps Directions Service Reference

You can refer the following link to obtain more information about direction service:

<https://developers.google.com/maps/documentation/javascript/directions>

2.4 Geolocation Reference

You can refer the following link to obtain more information about geolocation:

<https://developers.google.com/maps/documentation/javascript/geolocation>

3 Functionality

1. Start by modifying the favorites page from homework 2 to embed a google map under the table. You can remove the image which present under the table earlier.
2. The map should be centered on University coordinates (44.9727, -93.23540000000003) with zoom level of 14 (or any zoom level that you find appropriate). University coordinates can also be obtained using the following link: <https://www.gps-coordinates.net/>
3. Upon page load, the JavaScript code written by you should dynamically extract the names and addresses of your favorite places from the DOM objects that make up the table. An animated marker for each of these extracted locations should be placed on the map using the extracted address information. The markers should display the name of the place upon being clicked. This can be achieved using an information window.
4. The next step is to insert a form/input area between the table and the map. The elements in this form/input area will require you to use 'Google Places JavaScript library' and 'Google Maps Directions Service'.
5. The first row of these elements consists of:
 - A text input field labelled 'Radius': Specifies the numeric radius around your current location in which the search results will preferably be shown.
 - A drop-down field labelled 'Nearby': Lists categories of places for which you can search. The default categories for this homework are: restaurant, hospital, museum, and supermarket. You can replace these categories with additional categories present at: https://developers.google.com/places/supported_types. Make sure that at least one search result pops-up for each of the categories you include.
 - A button labelled 'Search Near Me': Upon clicking this button, your code should find all the places within the specified radius using 'Google Places JavaScript library' and display the results by placing a marker on the map for each of the places found. The old markers (e.g. the markers for your favorite places, and markers for any other category) should be cleared before placing new markers on the map. Upon clicking on the marker, the name of the place should be displayed.

6. The second row of the elements consists of:
 - A text input field labelled 'Destination': Allows the user to input the destination location. The source location will be the current location of the user and it can be obtained using geolocation.
 - A drop down field labelled 'Mode Of Travel': Four modes of travel are specified and they are: DRIVING, WALKING, BICYCLING, and TRANSIT. One of these must be selected at all times.
 - A button labelled 'Get Directions': Upon clicking this button, the route between the current location and the destination should be displayed on the map. The route displayed will be based on the mode of travel selected by the user. The directions associated with this route should be displayed on a scrollable side panel floating to the right of the map. Directions involving higher number of instructions should be wrapped into this fixed dimension panel with the scrollable feature. The source for the directions is the user's current location extracted using Google geolocation services. The source coordinates should not be hard-coded, they should be extracted dynamically using code (JavaScript). Make use of 'Google Maps Directions Service' for this functionality.
7. Retain the twitter widget developed for the second homework.
8. You will add an extra field labelled 'Additional Info URL' in the form developed for the second homework. This field will be optional and will accept a URL as input.

4 Screenshots

4.1 Table with a list of favorite places

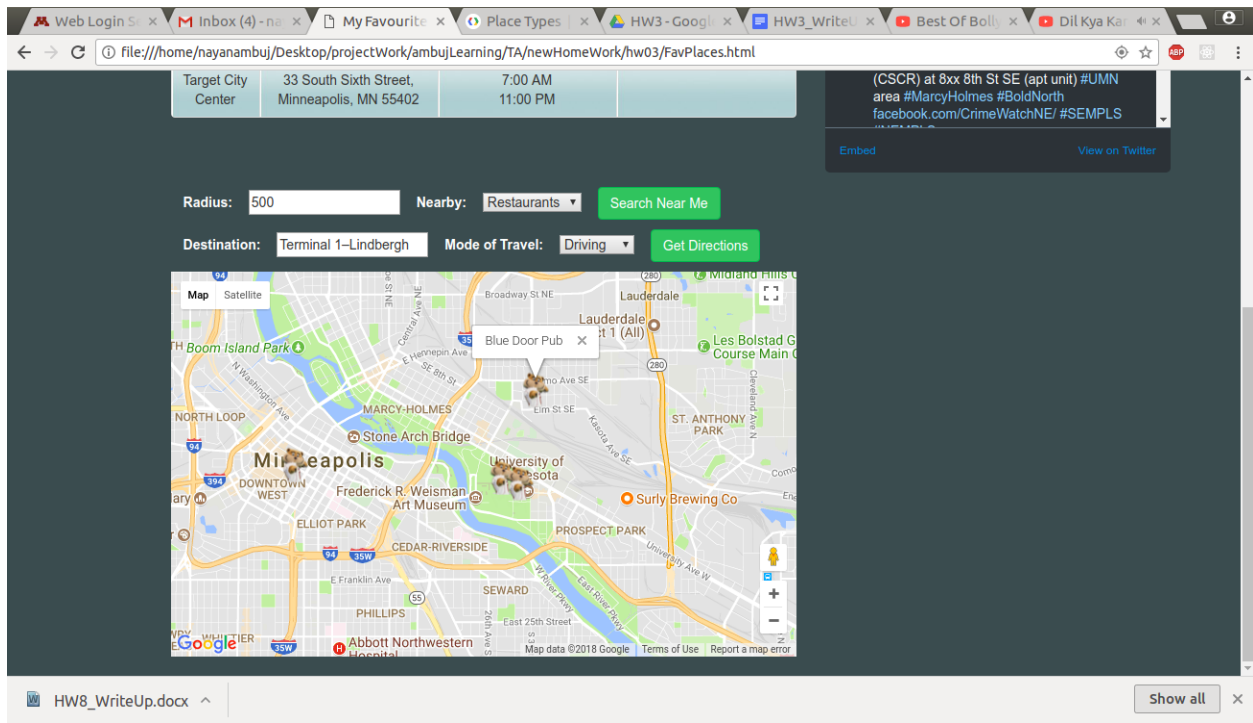
The screenshot shows a web application interface. At the top, there's a blue header with "Favourite Places" and "Form Input". Below this is a table with four columns: Name, Address, Hours of Operation (Open / Close), and Information. The table lists six locations: Home, Shepherd Labs, Blue Door Pub, Northrop Auditorium, and Target City Center. To the right of the table is a sidebar with social media feeds under the hashtag #UMN. Below the table and sidebar are search filters: Radius (500), Nearby (Restaurants), and a "Search Near Me" button. There's also a "Destination" field set to "Terminal 1-Lindbergh" and a "Mode of Travel" dropdown set to "Driving", with a "Get Directions" button. At the bottom, there's a map showing the location of the selected destination. The browser's address bar shows the file path: file:///home/nayanambuj/Desktop/projectWork/ambujLearning/TA/newHomeWork/hw03/FavPlaces.html.

Name	Address	Hours of Operation Open / Close	Information
Home	5965 Lake Avenue, St. Paul, MN 55110	12:00 AM 11:59 PM	
Shepherd Labs	100 Union St. SE, Minneapolis, MN 55455	7:00 AM 6:00 PM	
Blue Door Pub	1514 Como Avenue SE, Minneapolis, MN 55414	11:00 AM 11:00 PM	
Northrop Auditorium	84 Church Street SE, Minneapolis, MN 55455	7:00 AM 11:00 PM	
Target City Center	33 South Sixth Street, Minneapolis, MN 55402	7:00 AM 11:00 PM	

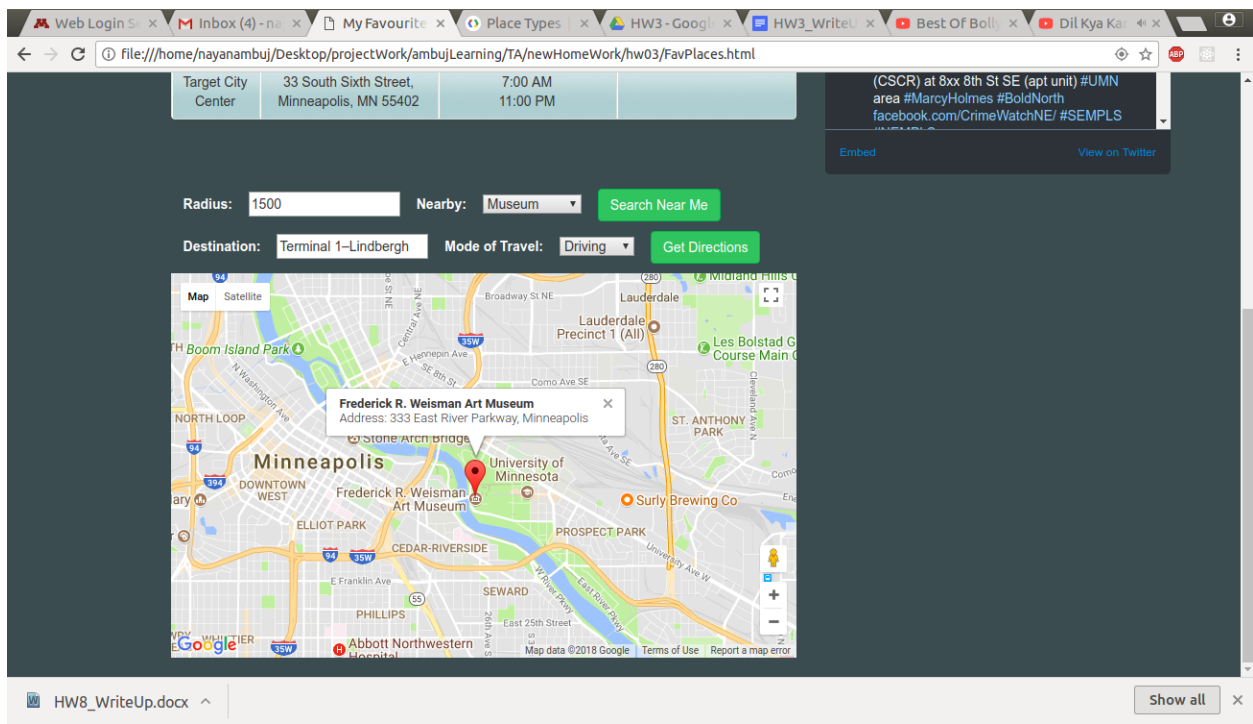
4.2 Map with the favorite places from the table (you can choose custom icons for markers)

This screenshot shows the same web application as the previous one, but with a map view. The map displays the city of Minneapolis, with several red location pins marking the favorite places listed in the table. The search filters and social media sidebar are still visible. The browser's address bar shows the same file path: file:///home/nayanambuj/Desktop/projectWork/ambujLearning/TA/newHomeWork/hw03/FavPlaces.html.

4.3 Marker shows the name of the favorite place when clicked



4.4 Map showing the result of nearby museums in a radius of 1500



4.5 Map showing the DRIVING route between the current place and Terminal 1–Lindbergh

Web Login S x M Inbox (4) - n x My Favourite x Place Types x HW3 - Googl x HW3_Writel x Best Of Boll x Naa Mang x

file:///home/nayanambuj/Desktop/projectWork/ambujLearning/TA/newHomeWork/hw03/FavPlaces.html

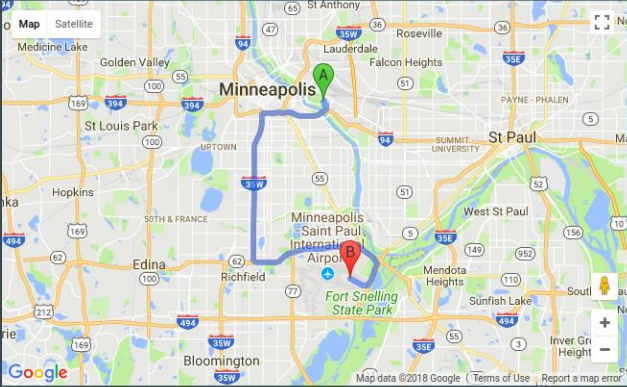
Target City: 33 South Sixth Street, Minneapolis, MN 55402 7:00 AM 11:00 PM

(CSCR) at 8xx 8th St SE (apt unit) #UMN area #MarcyHolmes #BoldNorth facebook.com/CrimeWatchNE/ #SEMPLS

Embed View on Twitter

Radius: 1500 Nearby: Museum Search Near Me

Destination: Terminal 1–Lindbergh Mode of Travel: Driving Get Directions



Map data ©2018 Google Terms of Use Report a map error

416 Erie St SE, Minneapolis, MN 55414, USA

14.2 mi. About 18 mins

1. Head north 62 ft
2. Turn right towards Erie St SE 151 ft
3. Turn right onto Erie St SE 0.1 mi
4. Turn left onto Fulton St SE 348 ft
5. Turn right onto Huron Blvd SE 427 ft
6. Keep left at the fork, follow signs for I-94 W and merge onto I-94 W 1.9 mi
7. Take exit 233B on the left to merge 5.0 mi

HW8_WriteUp.docx Show all x

4.6 Map showing the BICYCLING route between the current place and Terminal 1–Lindbergh

Web Login S x M Inbox (4) - n x My Favourite x Place Types x HW3 - Googl x HW3_Writel x Best Of Boll x Naa Mang x

file:///home/nayanambuj/Desktop/projectWork/ambujLearning/TA/newHomeWork/hw03/FavPlaces.html

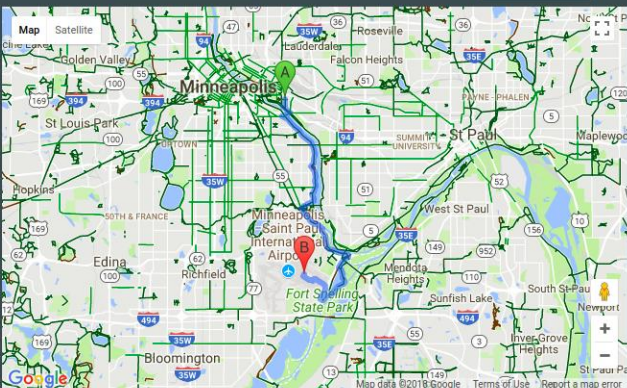
Target City: 33 South Sixth Street, Minneapolis, MN 55402 7:00 AM 11:00 PM

(CSCR) at 8xx 8th St SE (apt unit) #UMN area #MarcyHolmes #BoldNorth facebook.com/CrimeWatchNE/ #SEMPLS

Embed View on Twitter

Radius: 1500 Nearby: Museum Search Near Me

Destination: Terminal 1–Lindbergh Mode of Travel: Bicycling Get Directions



Map data ©2018 Google Terms of Use Report a map error

416 Erie St SE, Minneapolis, MN 55414, USA

11.7 mi. About 1 hour 35 mins

Bicycling directions are in beta. Use caution – This route may contain streets that aren't suited for bicycling.

1. Head east towards Erie St SE 115 ft
2. Turn right onto Erie St SE 0.3 mi
3. Turn right onto Dartmouth Ave SE 348 ft
4. Turn left onto E River Pkwy 0.3 mi
5. Turn right onto E Franklin Ave 0.3 mi

HW8_WriteUp.docx Show all x

4.7 Form

The screenshot shows a web browser window with multiple tabs. The active tab is titled 'Form Input' and displays a form with the following fields:

Place Name	<input type="text"/>
Address Line 1	<input type="text"/>
Address Line 2	<input type="text"/>
Start Time	<input type="text" value="--:--"/>
End Time	<input type="text" value="--:--"/>
Additional Info Text	<input type="text"/>
Additional Info URL	<input type="text"/>
<input type="button" value="Submit"/>	

5 Submission Instructions

1. For this assignment, you are expected to use and submit separate the HTML, CSS, and JavaScript files.
2. Your submission should include a minimum of 4 files (2 HTML, and 1 each for JavaScript and CSS).
3. Zip these files and the name of the zipped folder should be yourx500id_hw03.

PLEASE ENSURE TO TEST YOUR CODE ON CSE LAB MACHINES.

6 Evaluation

Your submission will be graded out of 100 points on the following items:

1. HTML files pass w3schools validator (<http://validator.w3.org>) without errors. Warnings are accepted (**5 points**).
2. CSS files pass w3schools validator (<http://jigsaw.w3.org/css-validator/>) without errors. Warnings are accepted (**5 points**).
3. Map is placed on webpage below the table with proper alignment as shown in pictures (**10 points**).
4. Animated markers are automatically placed on the locations specified in your table (**20 points**).

5. When clicked, markers display the name of your favorite place (**5 points**).
6. Nearby places can be searched within a specific radius and corresponding markers are created on map (**10 points**).
7. When clicked, markers display the name of the nearby place (**5 points**).
8. All previously displayed markers are removed before the results of a new search are displayed (**5 points**).
9. Correctly working functionality for finding directions to a custom destination from the user's current location.
 - Receiving destination through input text box and displaying directions on side panel (**10 points**).
 - Providing option to switch between multiple travel modes (**10 points**).
 - Style and alignment of the side panel with scroll feature as shown in picture (**5 points**).
10. The form page contains an additional input field to accept URLs. This field must be labelled 'Additional Info URL' (**5 points**).
11. All the files required for your solution should be packaged in a tar or zip file, and submitted via the link on the Moodle class site. The name of the zipped file should be yourx500id_hw03.zip (**5 points**).