

# Google APIs

Data Visualization and Google Maps

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# Data Visualization

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- **Data visualization is viewed by many disciplines as a modern equivalent of visual communication.**

# Google Charts

- Google charts is a JavaScript library to visualize the data using charts, lines, bubbles.
- Visualizing data is very important to monitor organizations situations based on the data, it works as a dashboard that tells us the status from real-time data.
- For data visualization in this class, we will use Google Charts.

<https://developers.google.com/chart/interactive/docs/gallery/piechart>

# Pie Charts

- Always remember, you don't need to remember the code for APIs, you just need to develop skills of How to use any API by common JavaScript skills.
- In the following chart, we will use a Pie Chart from Google Charts and visualize our daily events over time by the charts sectors.
- We will call charts externally from the following JavaScript file:

```
<script type="text/javascript"  
src="https://www.gstatic.com/charts/loader.js"> </script>
```

# Pie Chart

```
<html> <head>
<script type="text/javascript"
src="https://www.gstatic.com/charts/loader.js"></script>
<script type="text/javascript">
  google.charts.load('current', {'packages':['corechart']});
  google.charts.setOnLoadCallback(drawChart);
  function drawChart() {
    var data = google.visualization.arrayToDataTable([
      ['Task', 'Hours per Day'],
      ['Work',   11],
      ['Eat',    2],
      ['Commute', 2],
      ['Watch TV', 2],
      ['Sleep',  7]
    ]);
```

You need to change these red values, if you want to use the pie for another example.

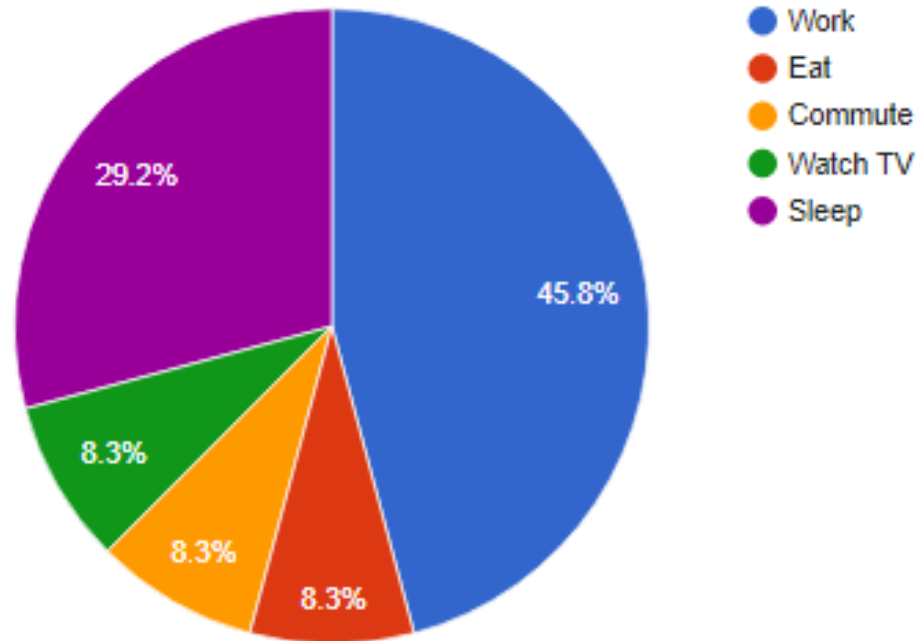
```
    var options = {
      title: 'My Daily Activities'
    };
    var chart = new
    google.visualization.PieChart(document.getElementById('piechart'));
    chart.draw(data, options);
  }
</script>
</head>
<body>
  <div id="piechart" style="width: 900px; height: 500px;"></div>
</body>
</html>
```

<https://www.w3schools.com/code/tryit.asp?filename=FP0OB43AQB3F>

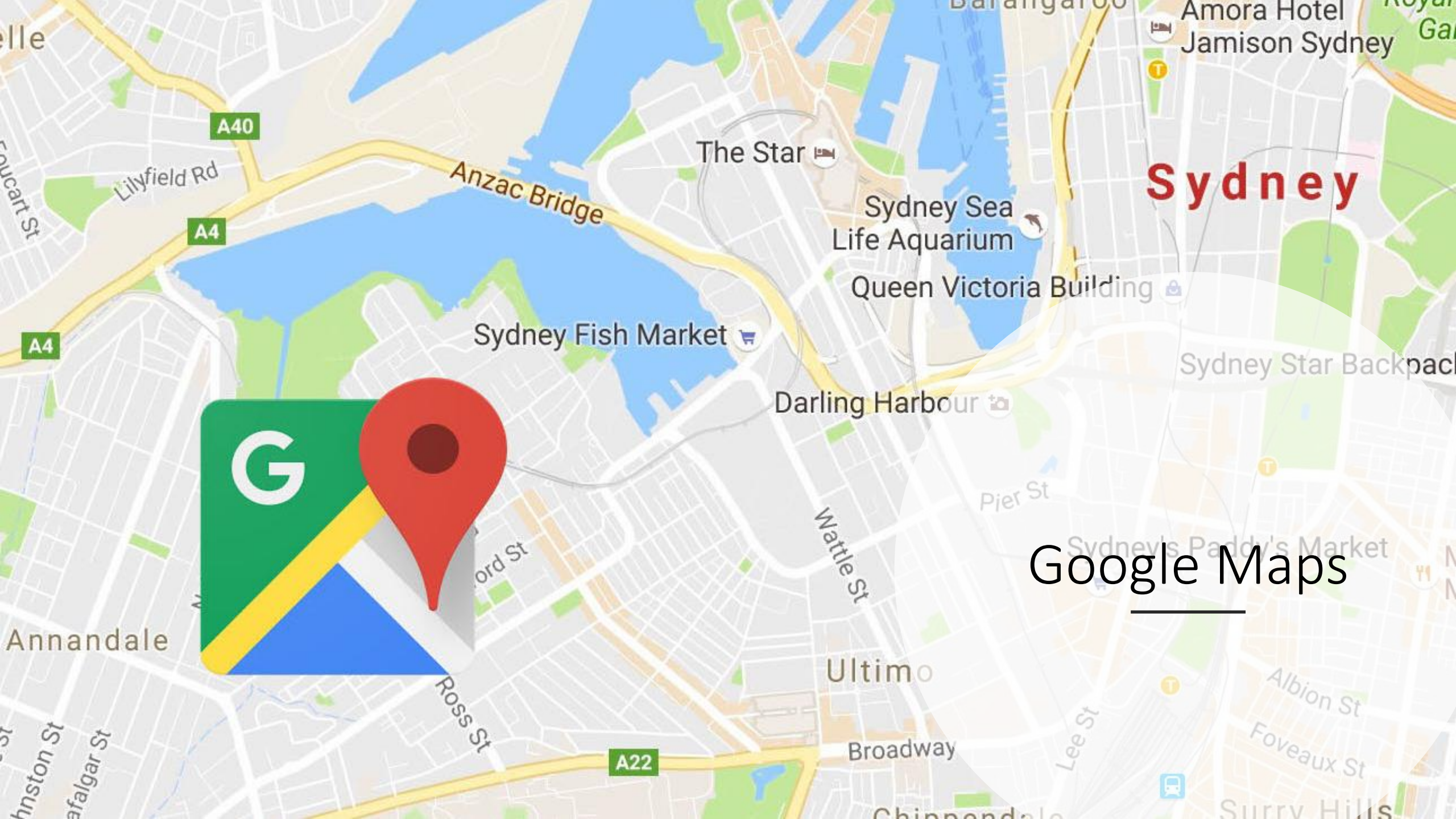
# Remember the values

**['Task', 'Hours per Day'],**  
**['Work', 11],**  
**['Eat', 2],**  
**['Commute', 2],**  
**['Watch TV', 2],**  
**['Sleep', 7]**

My Daily Activities







**Sydney**

Google Maps

# Google Maps API

- Login using Google account (gmail account), create one if you don't have it.
- To get started please click on the following link:
- <https://developers.google.com/maps/>
- Click on the web icon as in the picture `</>`

## Build the next generation of location experiences

We have the world mapped. With more than one billion global monthly active users in over 200 countries, our data gives you accurate real-time information for mapping, navigation and places.

Click here for web



iOS



HTTP

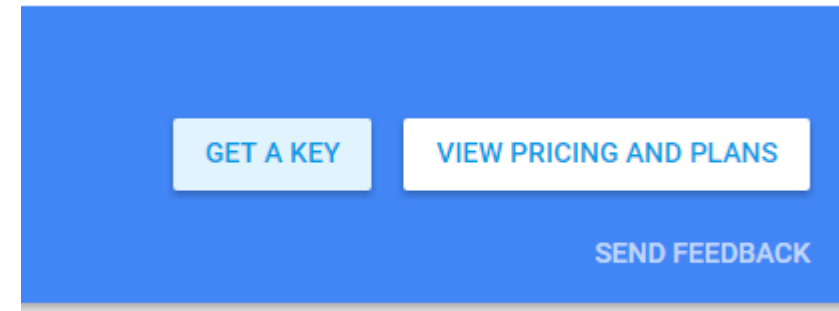
GET STARTED

CONTACT SALES



# Developer Key

- Most of the hot sites on the internet required a key to let the developers use their API.
- Lets get a key by pressing on GET A KEY button.
- From the pop up message, select API Project, Click on Yes radio button, then NEXT.



Enable Maps Web APIs

API Project

I agree that my use of any [services and related APIs](#) is subject to compliance with the applicable [Terms of Service](#).

☒ Yes ☐ No

CANCEL NEXT

# Developer Key

- Copy the key and click DONE
- Paste the key in some text file and save it, so you can use it later on.

You're all set!

You're ready to start developing!

YOUR API KEY

AI[REDACTED]X7E



 To improve your app's security, restrict this key's usage in the [API Console](#).

DONE

# JavaScript API

- From the different options you have , please click on Google Maps JavaScript API.
- For the chosen options and all other options, you will find many tutorials and documentations.

Use Google's native web APIs for visualizing maps and accessing rich mapping features like accurate directions and Street View. Whether you write JavaScript in your sleep or can't write a single line of code, we've got you covered.



## Google Maps JavaScript API

Customize maps with your own content and imagery. Robust feature support.



## Google Maps Embed API

Add a Google Map to your site without writing code or quota limits.

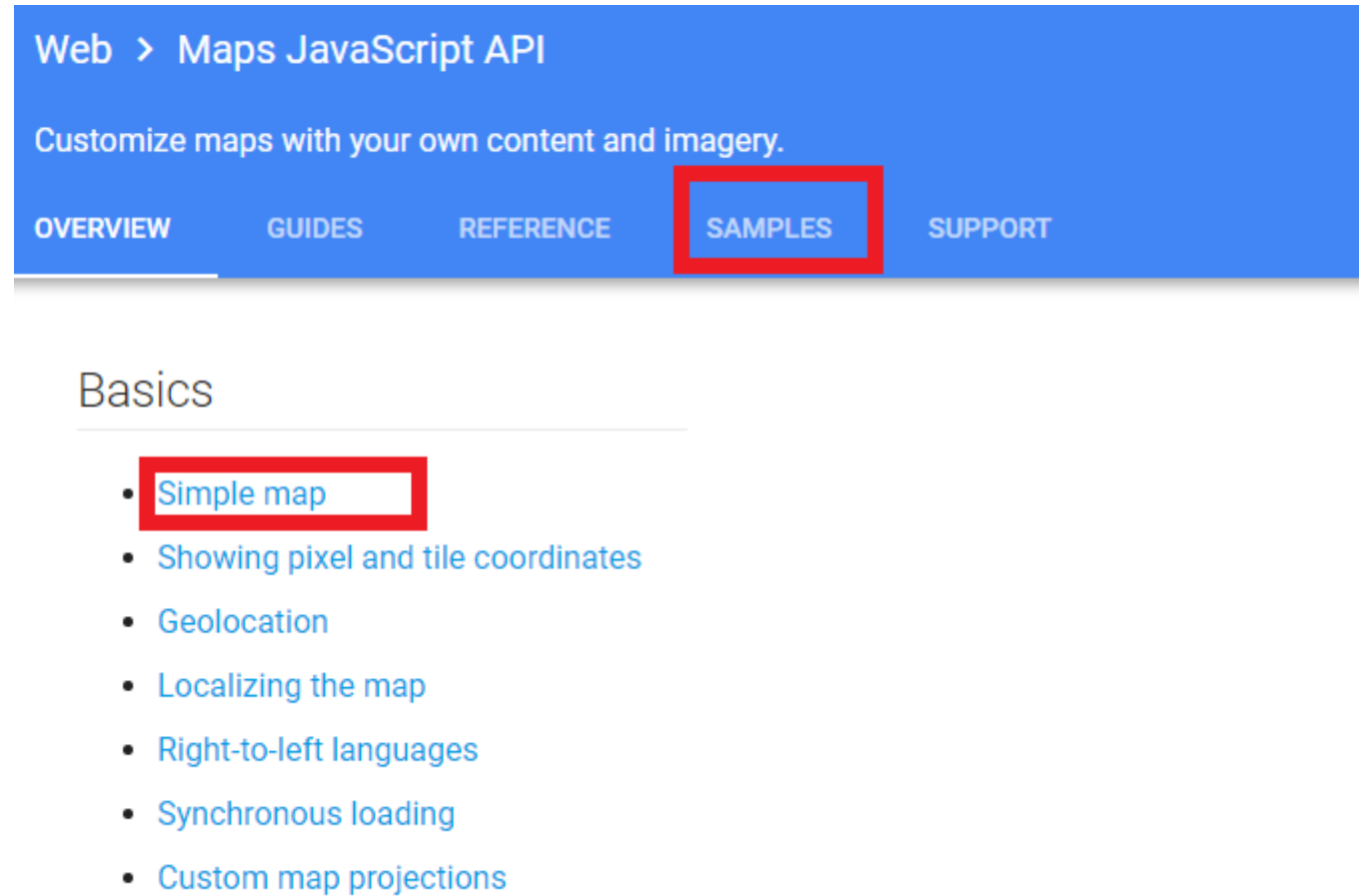


## Google Street View Image API

Real-world imagery and panoramas.

# Samples

- Click on SAMPLES Menu,
- From Basics, click on Simple map.



# Simple map

- Copy the code using the copy icon as in the picture.
- In myweb.cs.uwindsor.ca, in 307 folder, create googlemap folder, click on it, then create testmap.html in it.
- 

Try it yourself

Hover at top right of the code block to copy the code or open it in JSFiddle.

```
<!DOCTYPE html>
<html>
  <head>
    <title>Simple Map</title>
    <meta name="viewport" content="initial-scale=1.0">
    <meta charset="utf-8">
    <style>
      /* Always set the map height explicitly to define the size of the div
       * element that contains the map. */
      #map {
        height: 100%;
      }
      /* Optional: Makes the sample page fill the window. */
      html, body {
        height: 100%;
        margin: 0;
        padding: 0;
      }
    </style>
  </head>
  <body>
    <div id="map"></div>
    <script>
```





# testmap.html

- In testmap.html replace YOUR\_API\_KEY by the key you have obtained earlier.
- Then click save

```
</script>
<script src="https://maps.googleapis.com/maps/api/js?key=YOUR_API_KEY&callback=initMap"
  async defer></script>
</body>
</html>
```

[Preview Html](#)

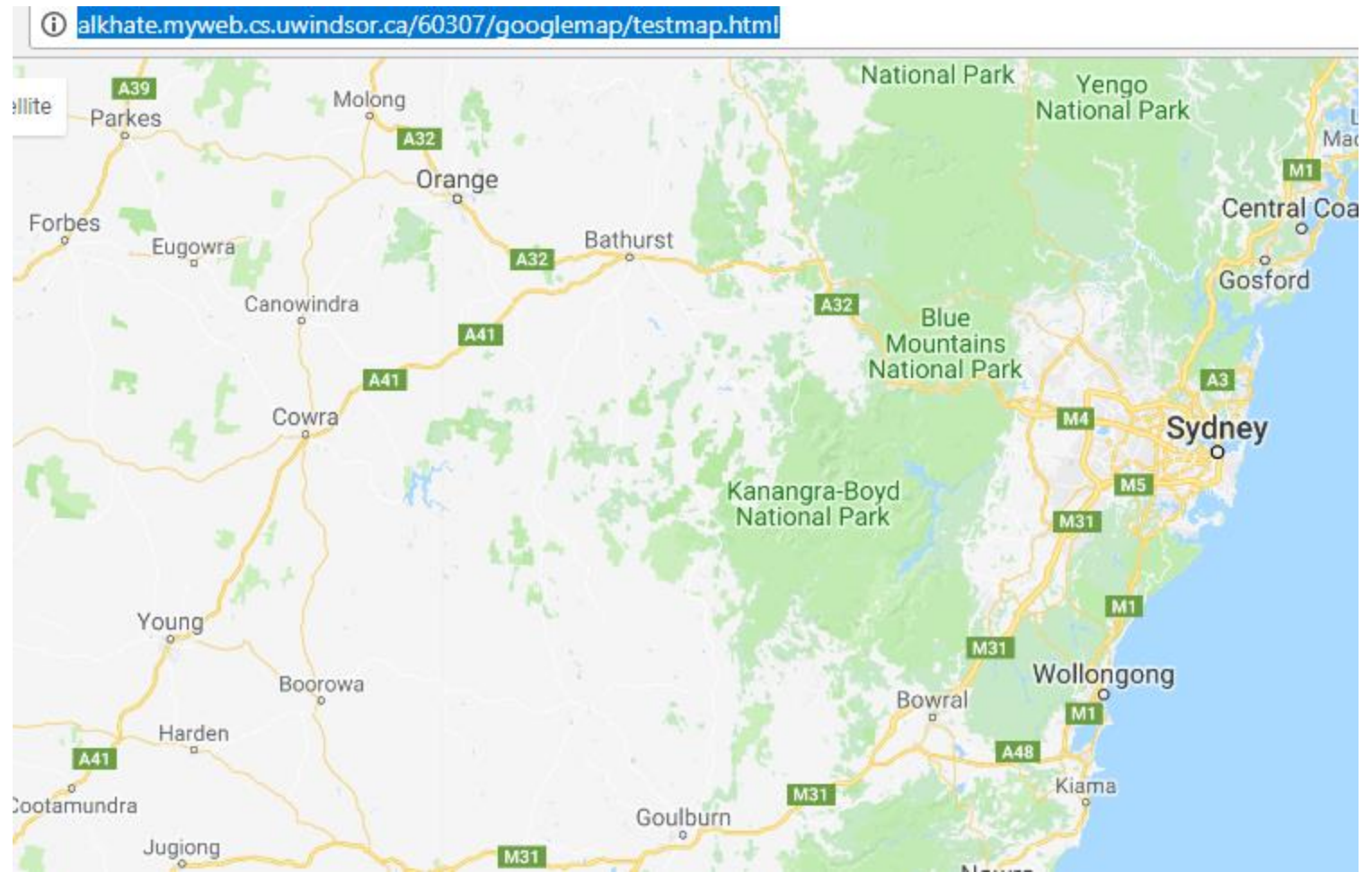
```
}  
</script>  
<script src="https://maps.googleapis.com/maps/api/js?key=AIzaSyA-...sA&callback=initMap"  
  async defer></script>  
</body>  
</html>
```

[Preview Html](#)

Save As testmap.html

# testmap.html

- <http://alkhate.myweb.cs.uwindsor.ca/60307/googlemap/testmap.html>
- Every place in the map has a geo-code which consists of latitude and longitude.



# uWin Geo-code

- To center the map around Our school, search the latitude and longitude and get it , it is **42.317432, -83.026772**. make the zoom value to be 17
- You may find the Geo-code from <https://www.maps.ie/coordinates.html>

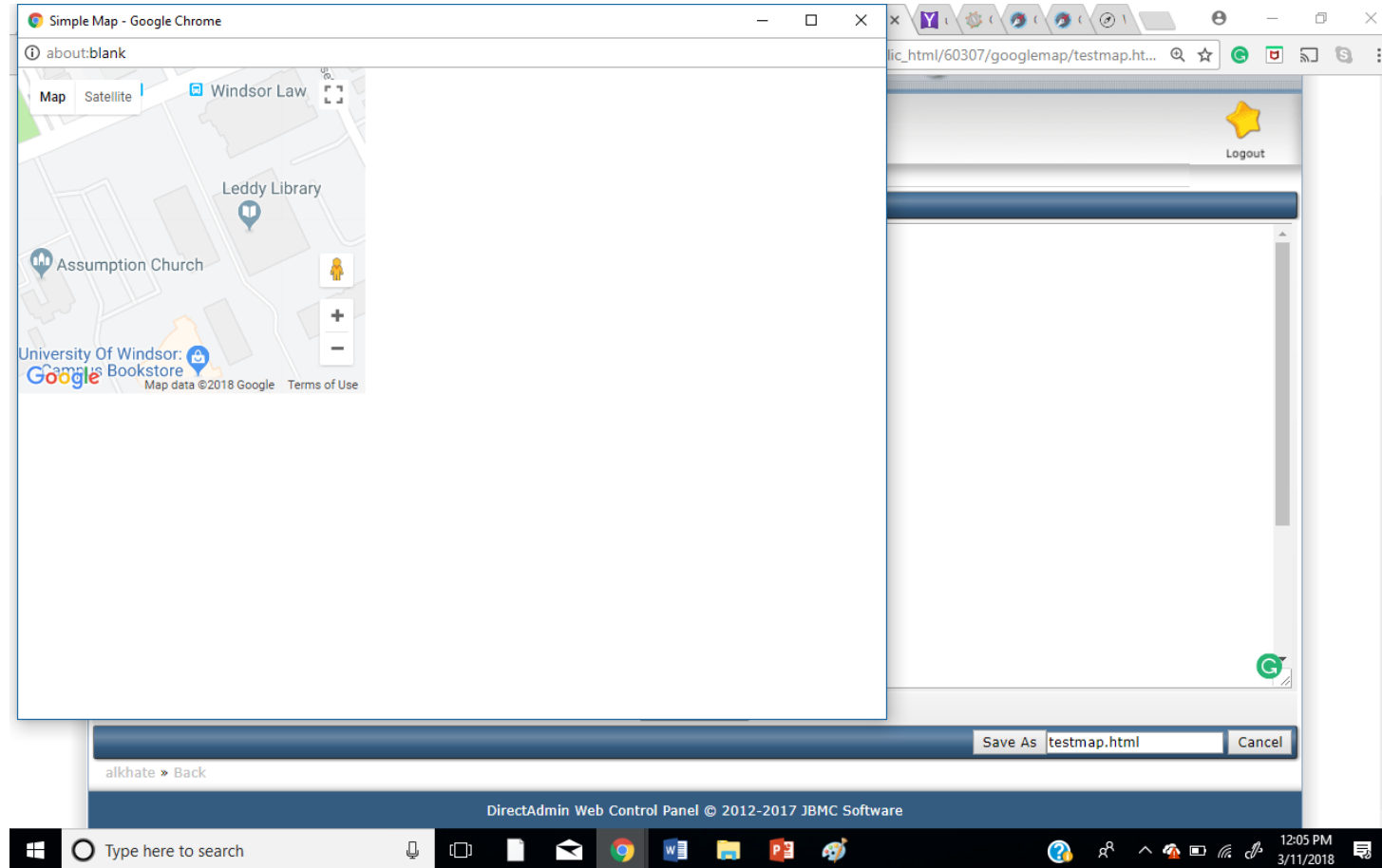
```
<script>  
    function initMap() {  
        map = new google.maps.Map(document.getElementById('map'), {  
            center: {lat: 42.3077143, lng: -83.06843579999997},  
            zoom: 17  
        });  
    }  
</script>
```

# Size of the map

- The map is included in div with id = map
- `<div id="map"></div>`
- To change the height and width, you may look change the CSS related to #map as the picture

```
<style>
  /* Always set the map height explicitly to define the size of the div
   * element that contains the map. */
  #map {
    height: 50%;
    width: 40%;
  }
  /* Optional: Makes the sample page fill the window. */
  html, body {
    height: 100%;
    margin: 0;
    padding: 0;
  }
</style>
```

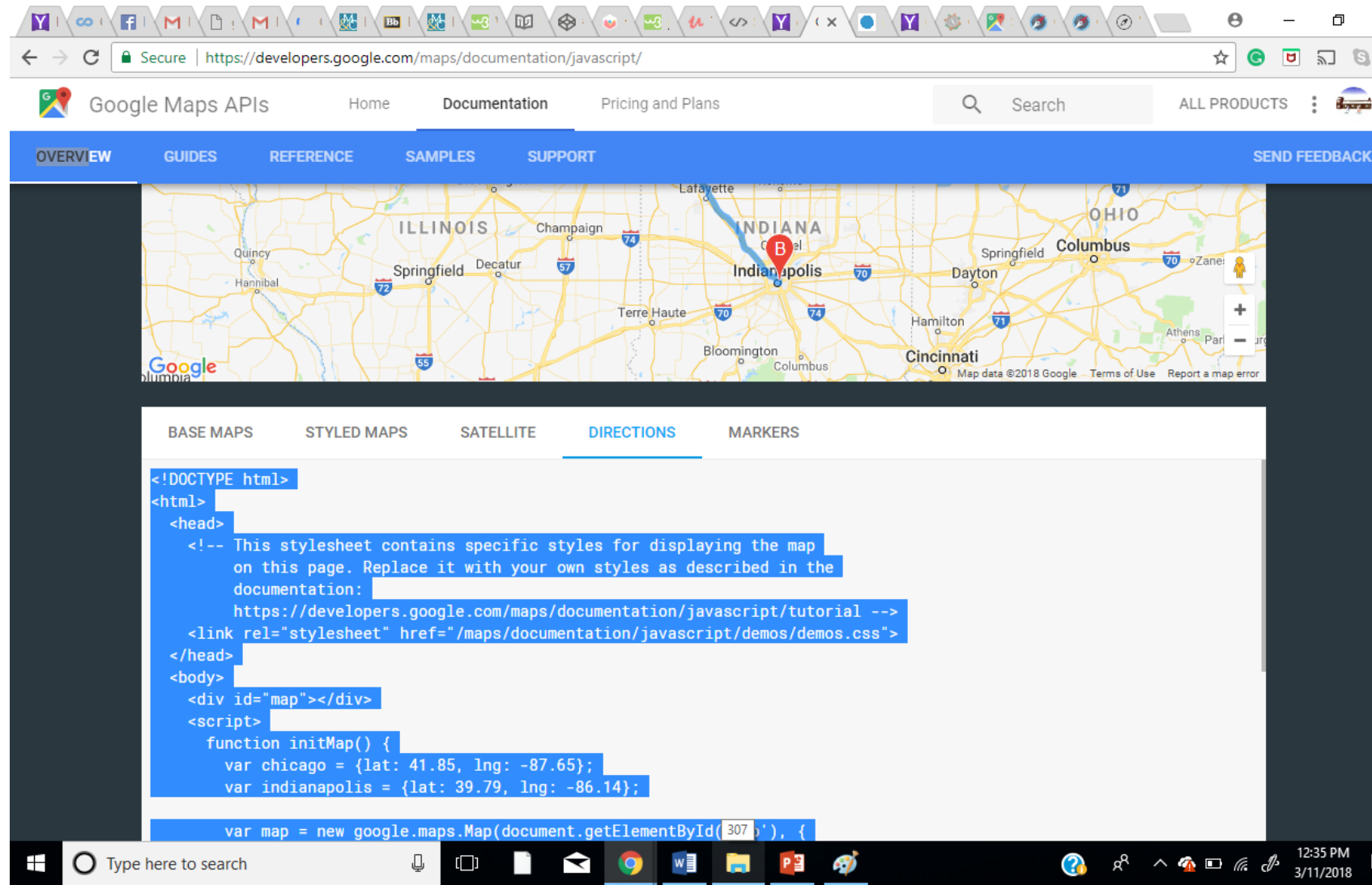
# Re-sized uWin map





# Directions

- Create directions.html in googlemap folder, copy testmap.html code in there.
- Remove function initMap() { ...}
- Back to Google Maps APIs-> web, Scroll down in Maps JavaScript API, from DIRECTIONS tab.



The screenshot shows the Google Maps API documentation page for the Directions service. The browser address bar displays the URL <https://developers.google.com/maps/documentation/javascript/>. The page has a blue header with navigation links: OVERVIEW, GUIDES, REFERENCE, SAMPLES, and SUPPORT. Below the header is a map of the central United States, showing Illinois, Indiana, and Ohio, with major cities like Chicago, Indianapolis, and Columbus labeled. A blue line indicates a route from Chicago to Indianapolis. Below the map is a tabbed interface with the following tabs: BASE MAPS, STYLED MAPS, SATELLITE, DIRECTIONS (which is the active tab), and MARKERS. The DIRECTIONS tab displays a code editor with the following HTML and JavaScript code:

```
<!DOCTYPE html>
<html>
  <head>
    <!-- This stylesheet contains specific styles for displaying the map
    on this page. Replace it with your own styles as described in the
    documentation:
    https://developers.google.com/maps/documentation/javascript/tutorial -->
    <link rel="stylesheet" href="/maps/documentation/javascript/demos/demos.css">
  </head>
  <body>
    <div id="map"></div>
    <script>
      function initMap() {
        var chicago = {lat: 41.85, lng: -87.65};
        var indianapolis = {lat: 39.79, lng: -86.14};

        var map = new google.maps.Map(document.getElementById('map'), {
```

The Windows taskbar at the bottom shows the search bar with the text "Type here to search" and the date and time "12:35 PM 3/11/2018".

# Directions

- Copy the function `initMap() { ...}` from DIRECTIONS tab and paste in the `direction.html` file to replace the deleted `initMap` function.
- Now you have a direction map, examine the code where it has starting point and destination geo-codes , request for direction.
- You don't have to memorize the code, each API has it is own JavaScript function, it is just how to use it, you always need to refer to documentations and tutorials.

# Directions

- <http://alkhate.myweb.cs.uwindsor.ca/60307/googlemap/direction.html>

