Google APIs

Data Visualization and Google Maps

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Data Visualization

- **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]
       ]);
```

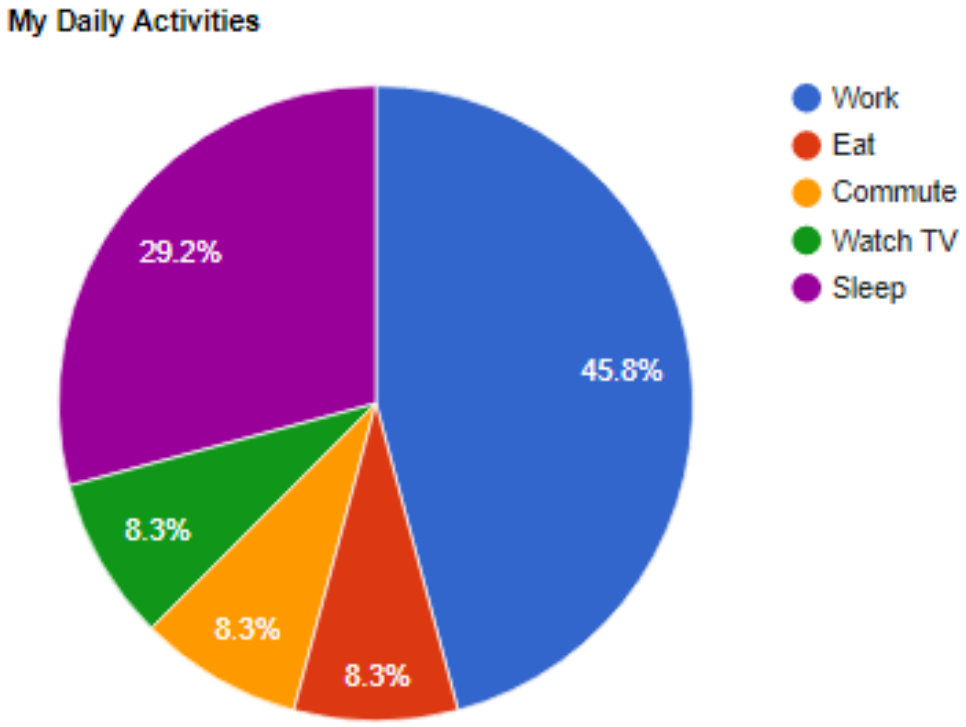
You need to change these red values, if you want to use the pie for another example.

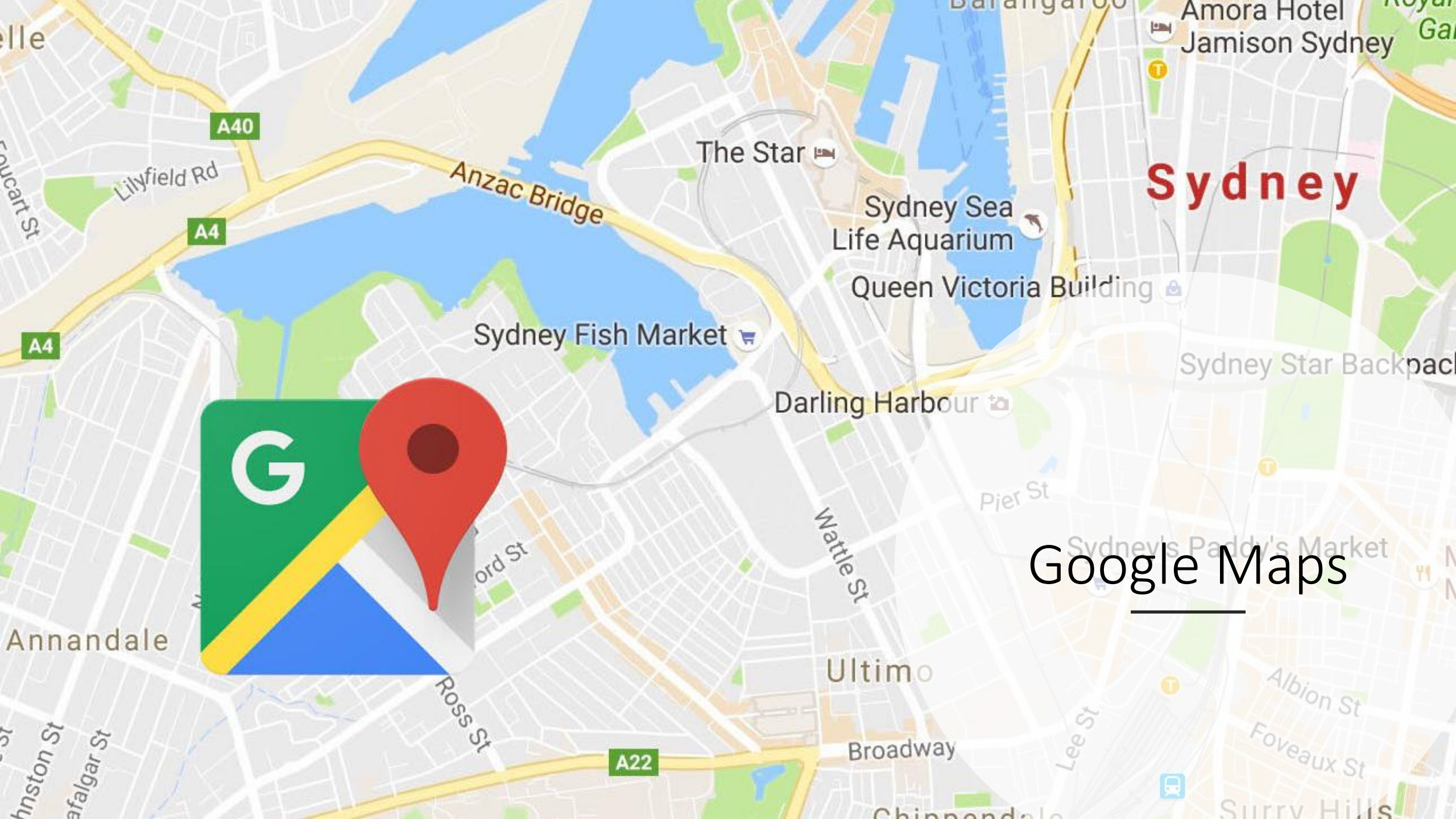
```
       var options = {
            title: 'My Daily Activities'
           };
           var chart = new
google.visualization.PieChart(document.getElementById('piechart'));
        chart.draw(data, options);
         }
       </script>
     </head>
     <body>
       <div id="piechart" style="width: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

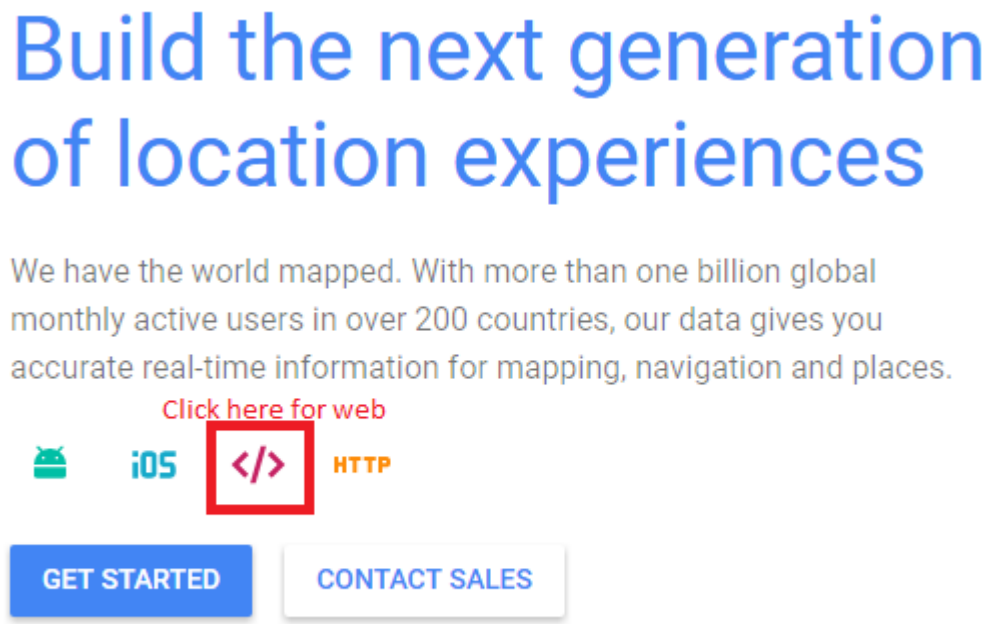



A40
A4
A4
A22
Lilyfield Rd
Anzac Bridge
The Star
Sydney
Sydney Sea
Life Aquarium
Queen Victoria Building
Sydney Fish Market
Darling Harbour
Sydney Star Backpack
Pier St
Wattle St
Annandale
Ultimo
Ross St
Broadway
Albion St
Foveaux St
Lee St
Amora Hotel
Jamison Sydney

Google Maps

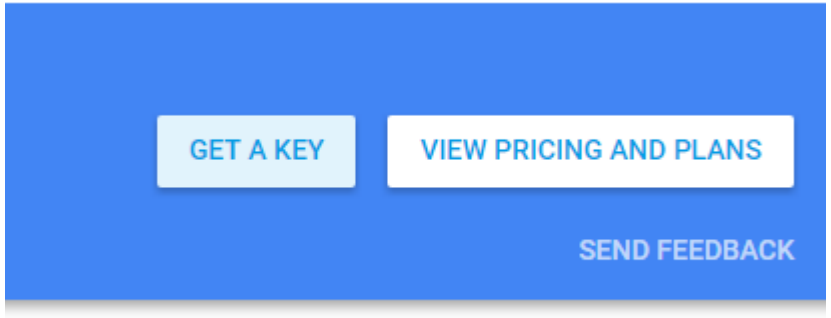
Google Maps API

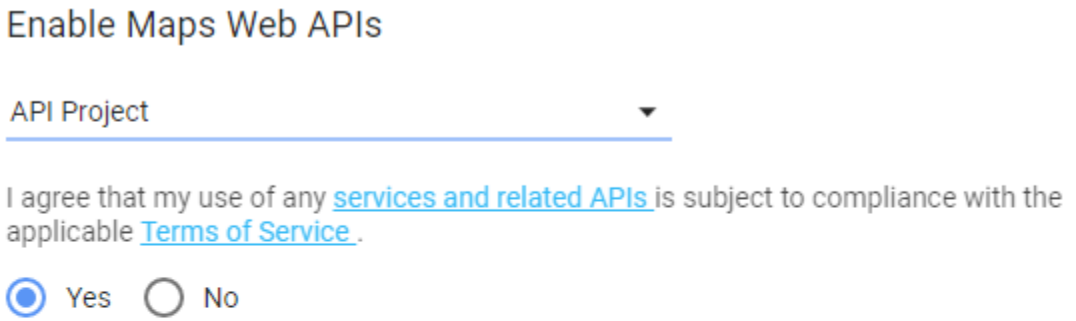
- Login using Google account (gmail account), create one if you don’t have it.
- To get started please click on the following link:
- https://developers.google.com/maps/
- Click on the web icon as in the picture </>



Developer Key

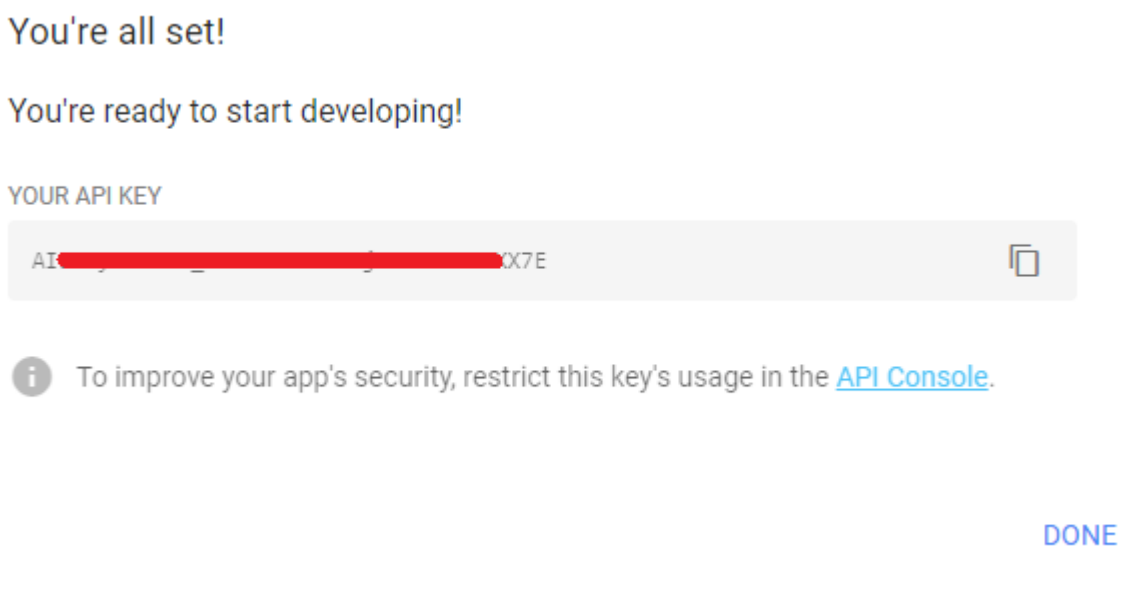
- Most of the hot sites on the internet required a key to let the developers use their API.
- Lets get a key by pressing on GET A KEY button.
- From the pop up message, select API Project, Click on Yes radio button, then NEXT.





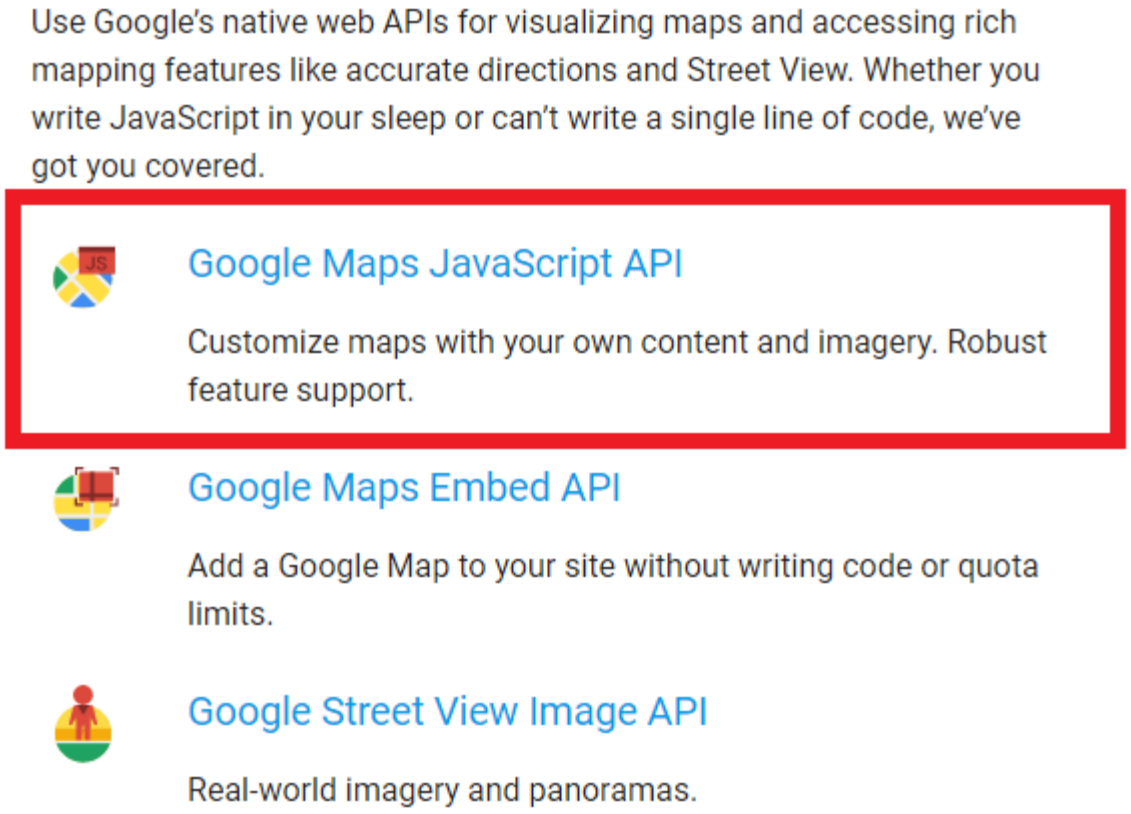
Developer Key

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



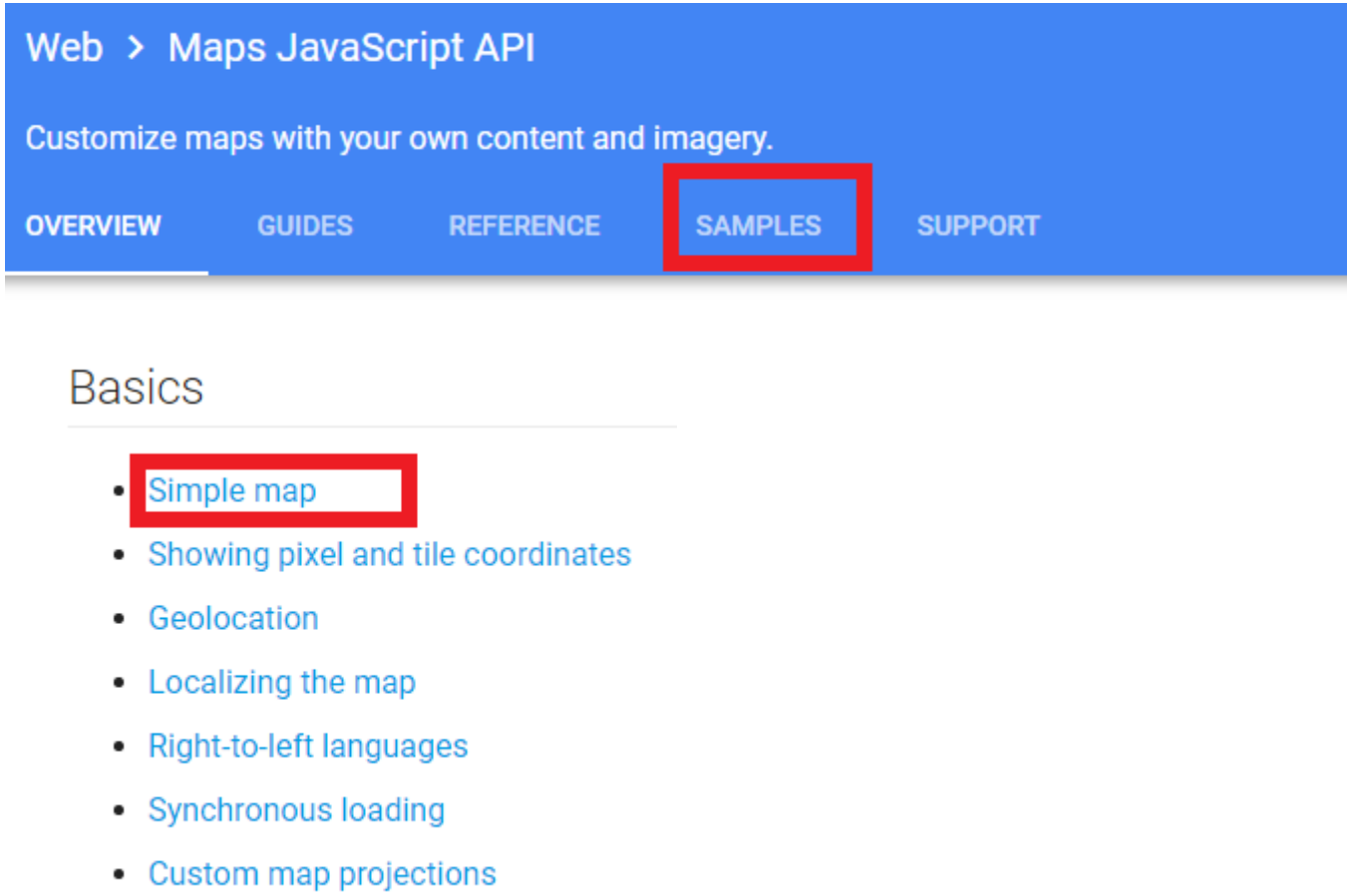
JavaScript API

- 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.



Samples

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



Simple map

- Copy the code using the coy 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.
-

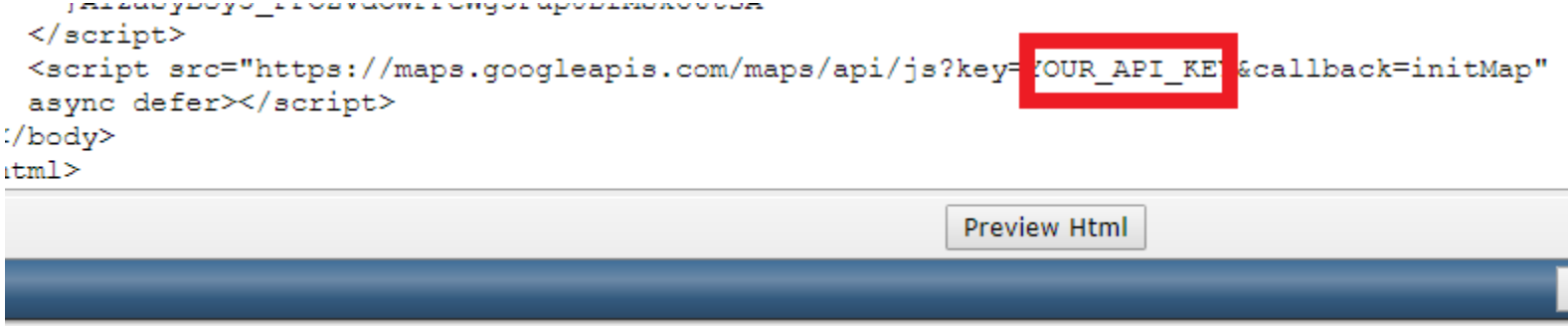
Try it yourself

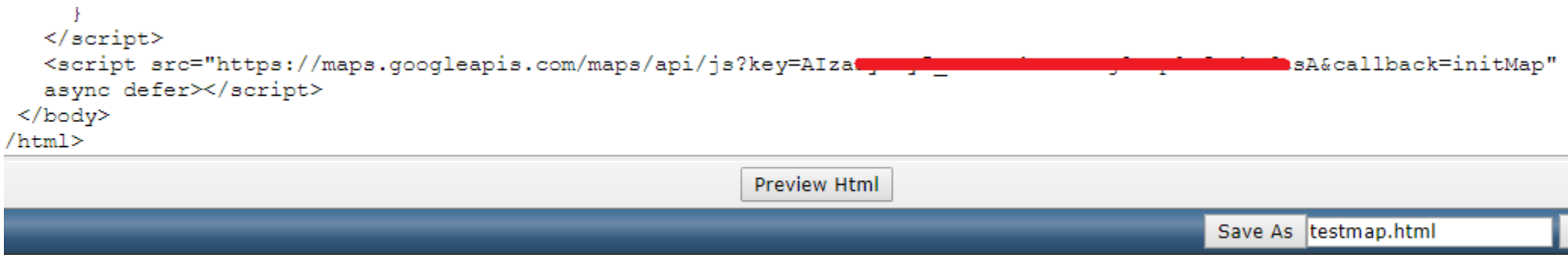
Hover at top right of the code block to copy the code or open it in JSFiddle.

```
<!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

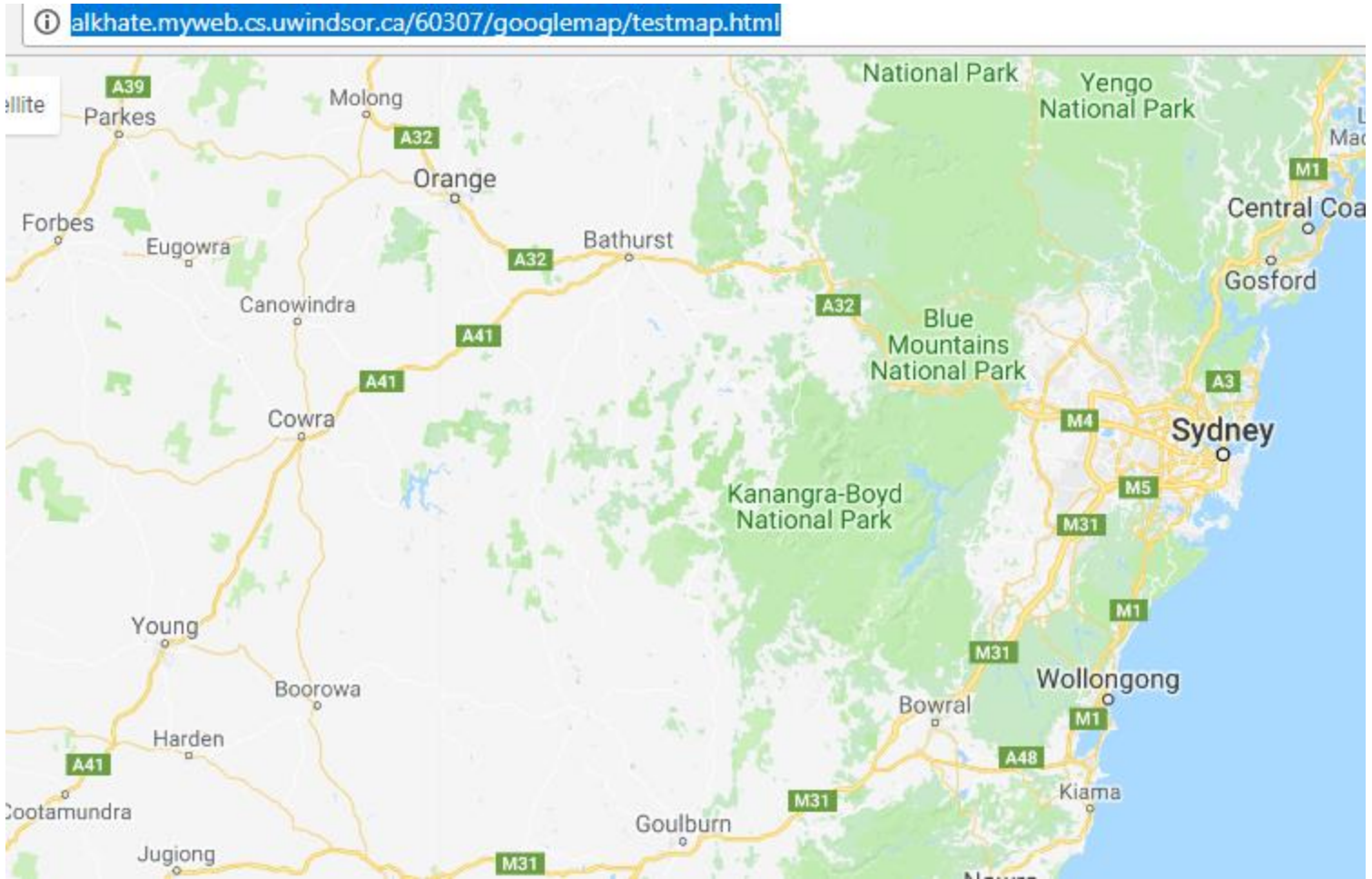
- In testmap.html replace YOUR_API_KEY by the key you have obtained earlier.
- Then click save





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

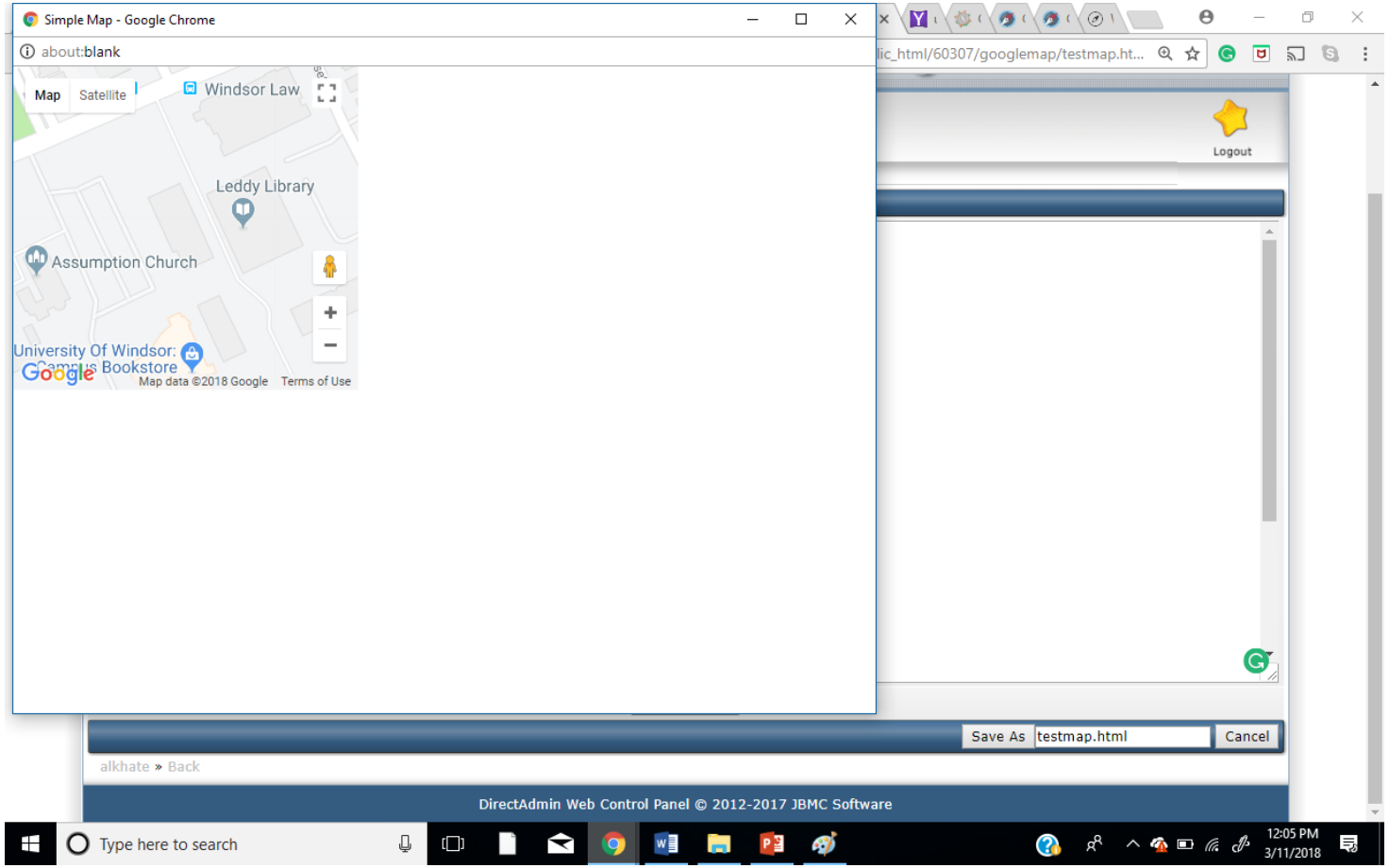
```
<script>
  function initMap() {
    map = new google.maps.Map(document.getElementById('map'), {
      center: {lat: 42.3077143, lng: -83.06843579999997},
      zoom: 17
    });
</script>
```

Size of the map

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

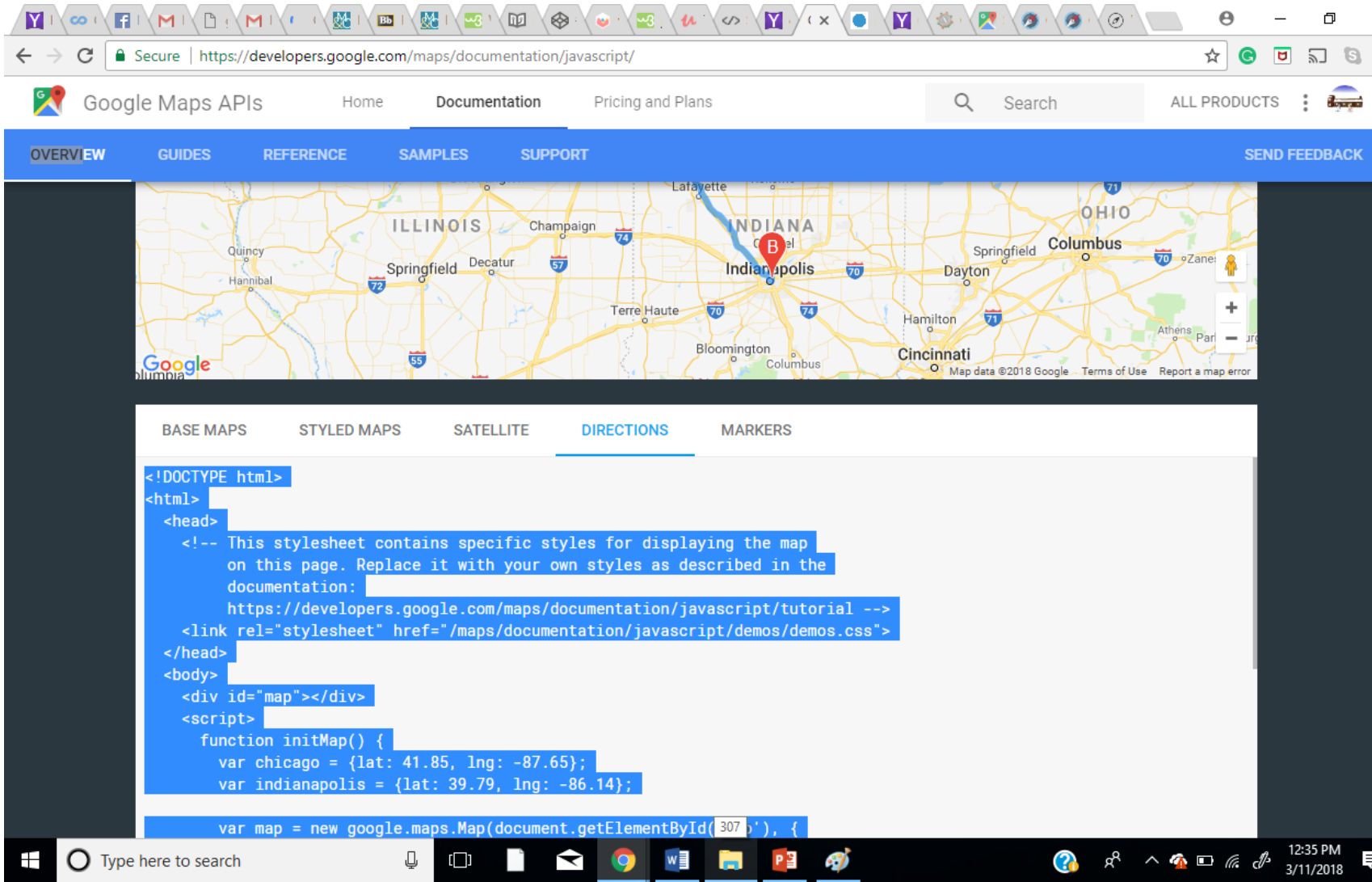
```
<style>
  /* Always set the map height explicitly to define the size of the div
   * element that contains the map. */
  #map {
    height: 50%;
    width:40%;
  }
  /* Optional: Makes the sample page fill the window. */
  html, body {
    height: 100%;
    margin: 0;
    padding: 0;
  }
</style>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

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.



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