GoogleMap

Definitely, Google map is one of popular web applications nowaday and better than Apple map.

- <u>Howto</u>: basic requirement of using Goole Map App
- <u>Template</u>: A simple demo of app using Google Map
- <u>Mark the Position</u>: anchor the position
- <u>Marker</u>
- <u>Demo</u>; Demo of Marker Draggable
- <u>How Far from Here</u> Distance Measurement
- <u>Make Note</u> List of Locations

Howto

To use the Google Map service, there are some standard procedures to do as folows:

1. **Use javascript library of the Google Map API's**

```
<script type="text/javascript"
    src="http://maps.googleapis.com/maps/api/js?sensor=true&language=tw&
v=3" >
</script>
```

option "sensor=true": use mobile device

1. **Initialize the service**

```
        function initialize() {
            // Options of Map
            // center position, rate of magnitude, and type of maps given
            var mapOptions = {
                center: new google.maps.LatLng(25.034264,121.389395),
                zoom: 16,
                mapTypeId: google.maps.MapTypeId.ROADP
            };
            // location at which the map is displayed
            var map = new google.maps.Map(document.getElementById("map_can
vas"),
                mapOptions);
        }
```

1. **Run the code while loaded**

```
        <body onload="initialize()">
        <div id="map_canvas" style="width: 600px;height: 400px;" />
```

Note

Here, type of maps is ROADP; other formats are

- MapTypeId.SATELLITE
- MapTypeId.HYBRID
- MapTypeId.TERRAIN
- MapTypeId.ROADMAP, defaulted.

Template

A simple demo:

```html
<html>
<head>
<script type="text/javascript"
      src="http://maps.googleapis.com/maps/api/js?sensor=true&language=tw
&v=3" >
</script>

<script type="text/javascript">
      function initialize() {
        var mapOptions = {
          center: new google.maps.LatLng(25.034264,121.389395),
          zoom: 16,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementById("map"),
          mapOptions);
      }

</script>
</head>
<body onload="initialize()">
      <div id="map" style="width: 600px;height: 400px;"/>
</body>
</html>
```

CSSModification

Except given the option of size of "map_canvas", we can aslo use CSS to set the size of Canvas of Map

```
<style>
    html, body, #map {
        height: 100%;
        width: 100%;
        margin: 0px;
        padding: 0px;
    }
</style>
```

The app size should be resized according to user's necessary.

In [8]:

```
from IPython.display import Image
Image("imgs/gmap-1.png")
```

Out[8]:

MarkThePosition

1. define the the latitude and lonitude of given position:

   ```
   var CGU_latlng = new google.maps.LatLng(25.034264,121.389395)
   ;
   ```

2. create marker:

   ```
   var marker = new google.maps.Marker({
       position: CGU_latlng,
       map: gmap,
       title:"Chang-gung University"
   });
   ```

Marker

```
<script type="text/javascript">
    window.onload = function () {
      // initialize Google Map
      var latlng = new google.maps.LatLng(25.034264,121.389395);
      var mapOptions = {
          zoom:12,
          center:latlng,
          mapTypeId: google.maps.MapTypeId.ROADMAP
      };
      var gmap = new google.maps.Map(document.getElementById("map_canvas"
  ), mapOptions);
      // Show Mark
      var CGU_latlng = new google.maps.LatLng(25.034264,121.389395);
      var marker = new google.maps.Marker({
          position: CGU_latlng,
          map: gmap,
          title:"Chang-gung University"
      });
    };
</script>
<body>
  <div id="map_canvas" style="width: 600px;height: 400px;" />
</body>
```

MarkerDraggable

1. Show the marker at defaulted position while loading;
2. Use mouse to drag the marker;
3. show the **new** Latitude and longitude of the position at which the mark was placed.

Basic HTML

Create a block to display the lat-long of poisition:

```
<div id="map_canvas" style="width: 600px;height: 480px;"></div><br />
<label for="latitude">Latitude:</label>
<input id="latitude" type="text" value="" />
<label for="longitude">Longitude:</label>
<input id="longitude" type="text" value="" />
```

This should create the input columns as follows:

""" Google Map Here """

Latitude: [   ]   Longitude: [   ]

JavaScript part

"HTML PART" Here....

```html
<script type="text/javascript">
  var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
      var mapOptions = {
          ...
      };
      var map = new google.maps.Map(document.getElementById("map_canvas"),mapOptions);

      // creates a draggable marker to the given coords
      var myMarker = new google.maps.Marker({
          ...
           draggable: true
      });

      google.maps.event.addListener(myMarker, 'dragend', function(evt) {
          document.getElementById('latitude').value = evt.latLng.lat();
          document.getElementById('longitude').value = evt.latLng.lng().toFixed(myCoordsLenght);
      });

      // centers the map on markers coords
      map.setCenter(myMarker.position);

      // adds the marker on the map
      myMarker.setMap(map);
  }

  google.maps.event.addDomListener(window, 'load', initialize);
</script>
```

Completed Codes

```html
<html lang="en">
<head>
    <meta charset="utf-8" />
    <script type="text/javascript" src="http://maps.google.com/maps/api/js
?sensor=true"></script>
</head>
<body>
    <div id="map_canvas" style="width: 600px;height: 400px;"></div><br />
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>
    <input id="longitude" type="text" value="" />
<script type="text/javascript">
  var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
    var mapOptions = {
        center: new google.maps.LatLng(defaultLat,defaultLng),
        zoom: 16,
        mapTypeId: google.maps.MapTypeId.ROADP
    };
    var map = new google.maps.Map(document.getElementById("map_canvas"),
mapOptions);

    var myMarker = new google.maps.Marker({
        position: new google.maps.LatLng(defaultLat, defaultLng),
        draggable: true
    });

    google.maps.event.addListener(myMarker, 'dragend', function(evt){
        document.getElementById('latitude').value = evt.latLng.lat();
        document.getElementById('longitude').value = evt.latLng.lng().to
Fixed(myCoordsLenght);
    });

    map.setCenter(myMarker.position);
    myMarker.setMap(map);
  }
  google.maps.event.addDomListener(window, 'load', initialize);
</script>
</body></html>
```

```
In [9]:
```

```
Image("imgs/gmap-2.png")
```

Out[9]:

Latitude: 25.034264   Longitude: 121.390168
The distance from Chang-Gung University to Destination:
128 m

Application

- Make Survey (get data in csv format)
- make map of survey data (by scratch or by Python)

```
In [4]:
```

```
IFrame(src="ntufolium.html", width="800px", height="500px" )
```

Out[4]:

```
In [ ]:
```

DistanceMeasurement

Codes, GPSCoord-2.html (codes/GPSCoord-2.html)

1. To access the function of distance measurement requires geometry libarary:

```
        <head>
          <script type="text/javascript"
               src="http://maps.google.com/maps/api/js?sensor=true&v=3&libr
   aries=geometry"></script>
        </head>
```

1. where the measurement is placed:

```
            <label>
                The distance from Chang-Gung University to Destination: <
        div id="distanceAB"></div>
            <label>
```

2. calculate the distance, set new coordinates, then measure by
   "google.maps.geometry.spherical.computeDistanceBetween()":

```
        google.maps.event.addListener(myMarker, 'dragend', function(evt){
            var newLat=evt.latLng.lat();
            var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
            document.getElementById('latitude').value = newLat;
            document.getElementById('longitude').value = newLng;
            var loc2 = new google.maps.LatLng(newLat, newLng);
            document.getElementById('distanceAB').innerHTML =
                Math.round(google.maps.geometry.spherical.computeDistance
    Between (loc1, loc2))+'  m';
        });
```

Sketch

```
                    HTML
            defaulted Lat/Lng                                        JavaScr
    ipt

        Latitude: (defaultLat)  Longitude: (defaultLng)     google.maps.event
    .addListener(,,function(evt))
                    |                        |                       :
                    |                        |                       :
                    ▼                        ▼                       :
                  newLat                   newLng                    :     w
    aiting for position changed
                    ▲                        ▲                       :
                    |                        |                       :
            evt.latLng.lat()  ◄-..  evt.latLng.lng() ◄------------ ┤      I
    f dragged
                                                                    :
                                                                    :
            <div id="distanceAB">      </div>                       :
                            ▲                                       :
                            L _____-┘

    google.maps.geometry.spherical.computeDistanceBetween(loc1,loc2)
```

Make a note via Google Map
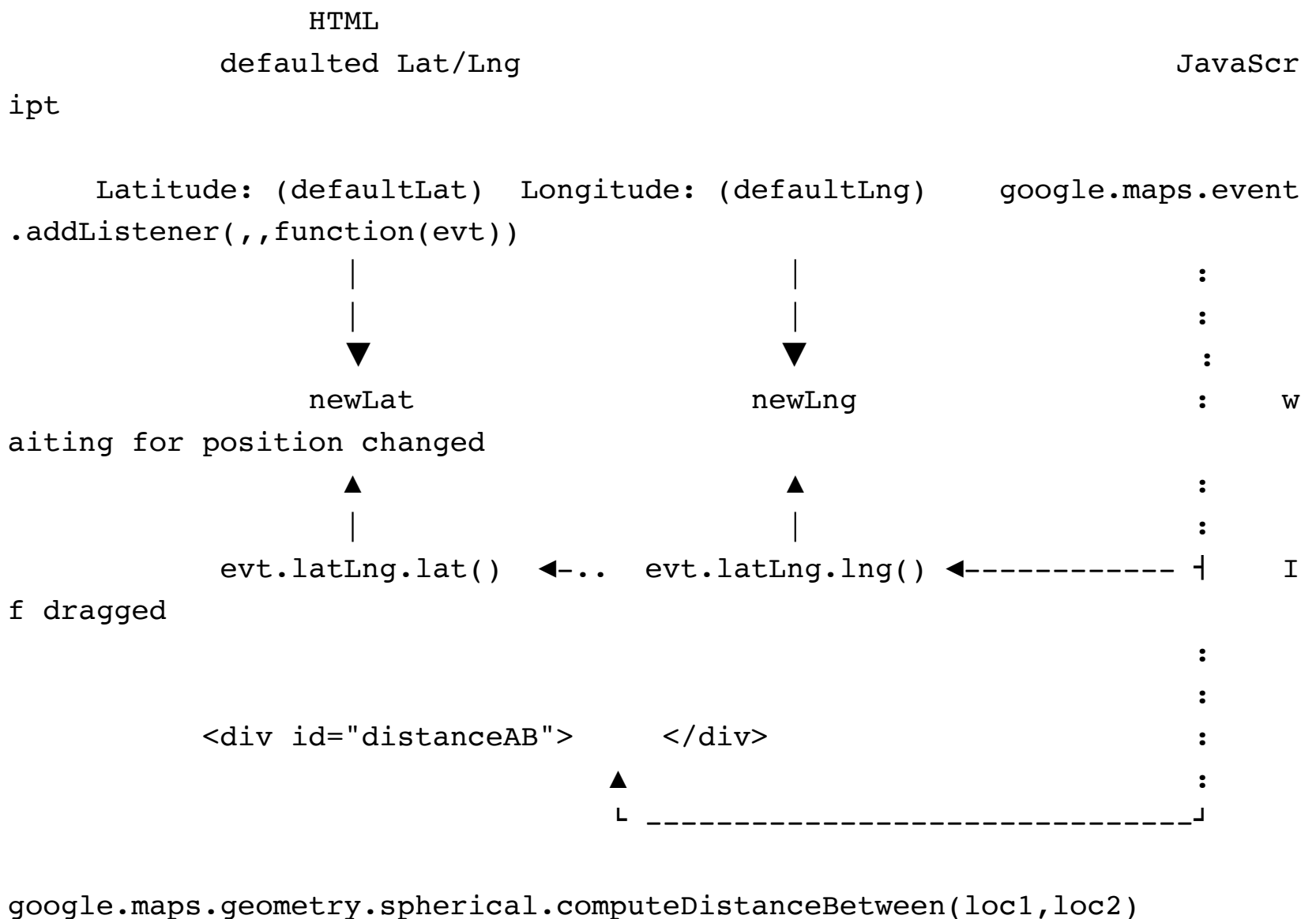
Create an arraay of latitude/longitude list for which we are interested. Move the marker to the place which we select from the HTML options.

- create the html options

```
<select id="PosMenu">
    <option value="0">Library</option>
    <option value="1">National Sport University</option>
    <option value="2">Post Office</option>
</select>
<div id="distanceAC">__</div>"
```

Result:

Library ⇕

—

- Array in Javascript

  var loc = [[25.034225,121.390168],[25.032047,121.386692],[25.032514, 121.390661]]

- show the marker at the place on the map while option was selected:

```
    document.getElementById('PosMenu').onchange = function() {
        var index = this.value;

        var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
        document.getElementById('distanceAC').innerHTML =
            Math.round(google.maps.geometry.spherical.computeDistanceBetwee
n (loc1, loc2))+'  m';
        var newMarker = new google.maps.Marker({
            position: new google.maps.LatLng(loc[index][0], loc[index][1]),
            draggable: myMarkerIsDraggable
        });

        // centers the map on markers coords
        var mapOptions = {
            ...
        };

        var map = new google.maps.Map(document.getElementById("map_canvas"
),mapOptions)

        google.maps.event.addListener(newMarker, 'dragend', function(evt){
            var newLat=evt.latLng.lat();
            var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
            document.getElementById('latitude').value = newLat;
            document.getElementById('longitude').value = newLng;
            var loc2 = new google.maps.LatLng(newLat, newLng);
            document.getElementById('distanceAB').innerHTML =
            Math.round(google.maps.geometry.spherical.computeDistanceBetwee
n (loc1, loc2))+'  m';
        });

        map.setCenter(newMarker.position);
        newMarker.setMap(map)
    }
```

In [ ]:

PositionMarker

```
<script type="text/javascript">
window.onload = function () {
    var latlng = new google.maps.LatLng(25.034264,121.389395);
    var mapOptions = {
        zoom:12,
        center:latlng,
        mapTypeId: google.maps.MapTypeId.ROADMAP
    };
    var gmap = new google.maps.Map($("map_canvas"), mapOptions);

    var Coordinates = [
        new google.maps.LatLng(25.034264,121.389395),
        new google.maps.LatLng(25.034264,121.391395),
        new google.maps.LatLng(25.036264,121.391395),
     ];
    var flightPath = new google.maps.Polyline({
        path: Coordinates,
        strokeColor: "#FF0000",
        strokeOpacity: 1.0,
        strokeWeight: 3,
        map: gmap
    });
 };
</script>
</head><body>
<div id="map_canvas" />
```

Practice

Make a squre around your dormitory and estimate the base area of the building.

Example1

Show the distance of destiny positions

```
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title></title>
    <script type="text/javascript"
        src="http://maps.google.com/maps/api/js?sensor=true&v=3&libraries=
geometry"></script>

<style type="text/css">
```

```
      body {
          margin: 10;
          padding: 10
       }
      #map_canvas {
           position: absolute;
           width: 60%;
           height: 60%;
           left:20%;
           right:20%;
           top:30%;
           overflow: auto
       }
</style>
</head>

<body>

    <div id="map_canvas"></div>
    <br />
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>bottom
    <input id="longitude" type="text" value="" />

    <br><label>
    The distance from Chang-Gung University to Destination: <div id="dist
anceAB"></div>
    <label>
    <br>
      The distance from Chang-Gung University to Destination
      <select id="PosMenu">
              <option value="0">library</option>
              <option value="1">NSU</option>
              <option value="2">PO</option>
        </select>
      <div id="distanceAC"></div>

<script type="text/javascript">

   var myZoom = 16;
   var myMarkerIsDraggable = true;
   var myCoordsLenght = 6;
   var defaultLat = 25.035255529260443;
   var defaultLng = 121.389524;
   var loc1 = new google.maps.LatLng(25.035255529260443, 121.389524);
   var loc = [[25.034225,121.390168],[25.032047,121.386692],[25.032514, 12
1.390661]];
```

```javascript
  function initialize() {
    var mapOptions = {
        center: new google.maps.LatLng(defaultLat,defaultLng),
        zoom: myZoom,
        mapTypeId: google.maps.MapTypeId.ROADP
    };
    var map = new google.maps.Map(document.getElementById("map_canvas"),m
apOptions);
    // creates a draggable marker to the given coords    -3.118-3.118

    var myMarker = new google.maps.Marker({
    position: new google.maps.LatLng(defaultLat, defaultLng),
    draggable: myMarkerIsDraggable
    });


    google.maps.event.addListener(myMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
    document.getElementById('latitude').value = newLat;
    document.getElementById('longitude').value = newLng;
    var loc2 = new google.maps.LatLng(newLat, newLng);
    document.getElementById('distanceAB').innerHTML =
        Math.round(google.maps.geometry.spherical.computeDistanceBetween (
loc1, loc2))+'  m';

    });

    // centers the map on markers coords
    map.setCenter(myMarker.position);

    // adds the marker on the map
    myMarker.setMap(map);
  }

  google.maps.event.addDomListener(window, 'load', initialize);

  document.getElementById('PosMenu').onchange = function() {
    var index = this.value; // array indices start at 0
    //alert(loc[index][0]);
    var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
    document.getElementById('distanceAC').innerHTML =
    Math.round(google.maps.geometry.spherical.computeDistanceBetween (loc
1, loc2))+'  m';
    var newMarker = new google.maps.Marker({
        position: new google.maps.LatLng(loc[index][0], loc[index][1]),
        draggable: myMarkerIsDraggable
    });
```

```javascript
    // centers the map on markers coords
    var mapOptions = {
        center: new google.maps.LatLng(defaultLat,defaultLng),
        zoom: myZoom,
        mapTypeId: google.maps.MapTypeId.ROADP
    };

    var map = new google.maps.Map(document.getElementById("map_canvas"),mapOptions)

    google.maps.event.addListener(newMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
        document.getElementById('latitude').value = newLat;
        document.getElementById('longitude').value = newLng;
        var loc2 = new google.maps.LatLng(newLat, newLng);
        document.getElementById('distanceAB').innerHTML =
            Math.round(google.maps.geometry.spherical.computeDistanceBetween (loc1, loc2))+'  m';
    });

    map.setCenter(newMarker.position);

    // adds the marker on the map
    newMarker.setMap(map)
  }

</script>

</body>
</html>
```

AreaEstimation

The steps to solve the last practice, mark a region:

1. Find the the (latitude, longitude)'s of defaulted building;
2. make a closed polygon formed by set of given points, found by above;
3. calculate the area of polygon above.

code1-1

```
<head>
    <meta charset="utf-8" />
    <title>Laditude and Longitude</title>
    <script type="text/javascript" src="http://maps.google.com/maps/api/
js?sensor=true" >
    </script>
 </head>
```

code1-2

```
<head>
    <meta charset="utf-8" />
    <title>Laditude and Longitude</title>
    <script type="text/javascript" src="http://maps.google.com/maps/api/
js?sensor=true" >
    </script>
 </head>
```

```html
<body>
    <div id="map_canvas" style="width: 600px;height: 400px;"></div><br>
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>
    <input id="longitude" type="text" value="" />
<script type="text/javascript">
    var myZoom = 16;
    var myMarkerIsDraggable = true;
    var myCoordsLenght = 6;
    var defaultLat = 25.034264;
    var defaultLng = 121.389395;

    function initialize() {
      var mapOptions = {
            center: new google.maps.LatLng(defaultLat,defaultLng),
            zoom: myZoom,
            mapTypeId: google.maps.MapTypeId.ROADP
      };
      var map = new google.maps.Map(document.getElementById("map_canvas"),mapOptions);

      // creates a draggable marker to the given coords
      var myMarker = new google.maps.Marker({
      position: new google.maps.LatLng(defaultLat, defaultLng),
      draggable: myMarkerIsDraggable
      });

      google.maps.event.addListener(myMarker, 'dragend', function(evt){
      document.getElementById('latitude').value = evt.latLng.lat().toFixed(myCoordsLenght);
      document.getElementById('longitude').value = evt.latLng.lng().toFixed(myCoordsLenght);
      });

      // centers the map on markers coords
      map.setCenter(myMarker.position);

      // adds the marker on the map
      myMarker.setMap(map);
    }

    google.maps.event.addDomListener(window, 'load', initialize);
</script>
</body>
```

Code 2-1

```html
<script>
  // This example creates a simple polygon representing the library build
ing in CGU .
  var myZoom = 16;
  //var myMarkerIsDraggable = true;
  //var myCoordsLenght = 6;
  var defaultLat = 25.034264;
  var defaultLng = 121.389395;

  function initialize() {
    var mapOptions = {
        center: new google.maps.LatLng(defaultLat,defaultLng),
        zoom: myZoom,
        mapTypeId: google.maps.MapTypeId.TERRAIN
    };
    var map = new google.maps.Map(document.getElementById('map_canvas'),m
apOptions);

    // Define the LatLng coordinates for the polygon's path.
    var PolygonCoords = [
        new google.maps.LatLng(25.034200,121.390527),
        new google.maps.LatLng(25.034020,121.390790),
        new google.maps.LatLng(25.033413,121.390237),
        new google.maps.LatLng(25.033612,121.390001),
        new google.maps.LatLng(25.034200,121.390527)
    ];
    // Construct thepolygon.
    var myPolygon;
    myPolygon= new google.maps.Polygon({
      paths: PolygonCoords,
      strokeColor: '#FF0000',
      strokeOpacity: 0.8,
      strokeWeight: 2,
      fillColor: '#FF0000',
      fillOpacity: 0.35
    });
    myPolygon.setMap(map);
  }
  google.maps.event.addDomListener(window, 'load', initialize);
  </script>
```

Code2-2

```html
<body>
    <div id="map_canvas" style="width: 600px;height: 400px;"></div>
</body>
```

Code3-1

```
<script type="text/javascript"
    src="https://maps.googleapis.com/maps/api/js?libraries=geometry&senso
r=false" >
</script>
<script type="text/javascript">
    var myZoom = 16;
    var myMarkerIsDraggable = true;
    var myCoordsLenght = 6;
    var defaultLat = 25.034264;
    var defaultLng = 121.389395;
    var map;
    function initialize(){
        var mapOptions = {
          center: new google.maps.LatLng(defaultLat,defaultLng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementById("map_canvas
"),mapOptions);
    }
    google.maps.event.addDomListener(window, 'load', initialize);
</script>
```

Code3-2

```
<script>
    function test(){
        var arr = new Array()
        arr.push('25.034200,121.390527');
        arr.push('25.034020,121.390790');
        arr.push('25.033413,121.390237');
        arr.push('25.033612,121.390001');
        arr.push('25.034200,121.390527');
        AreaComp(arr);
    }
    function AreaComp(CoordArr){
        var a = new Array();

        for(var i=0; i<CoordArr.length; i++){
            var point = CoordArr[i].split(",");
            a[i] = new google.maps.LatLng(point[0],point[1]);
        }

        mypolygon = new google.maps.Polygon({
            paths: a,
            strokeColor: "#22B14C",
            strokeOpacity: 0.8,
            strokeWeight: 2,
            fillColor: "#22B14C",
            fillOpacity: 0.35
        })

        mypolygon.setMap(map);//until here is ok
        var z =  google.maps.geometry.spherical.computeArea(mypolygon.getPat
h());
        alert(z); //this is not working
    }
</script>
```

Code3-3

```
<body onload="test();">
    <div id="map_canvas" style="width: 600px;height: 400px;"></div>
</body>
```

Marauders Maps

The Marauder's Map is a magical document that reveals all of Hogwarts School of Witchcraft and Wizardry.

```
<!doctype html>
```

```html
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title></title>
    <script type="text/javascript"
        src="http://maps.google.com/maps/api/js?sensor=true&v=3&libraries=
geometry"></script>

<style type="text/css">
    body {
        margin: 10;
        padding: 10
     }
    #map_canvas {
        position: absolute;
        width: 60%;
        height: 60%;
        left:20%;
        right:20%;
        top:30%;
        overflow: auto
     }
</style>
</head>

<body>

    <div id="map_canvas"></div>
      The distance from Chang-Gung University to Destination
      <select id="PosMenu">
            <option value="0">library</option>
            <option value="1">NSU</option>
            <option value="2">PO</option>
        </select>
      <div id="distanceAC"></div>
<script type="text/javascript">
    var myZoom = 16;
    var myMarkerIsDraggable = true;
    var myCoordsLenght = 6;
    var defaultLat = 25.035255529260443;
    var defaultLng = 121.389524;
    var loc1 = new google.maps.LatLng(defaultLat , defaultLng);
    var loc = [[25.034225,121.390168],[25.032047,121.386692],[25.032514, 1
21.390661]];

    var loctoLib=[[25.035236, 121.389524],[25.034225,121.390168]];
    var loctoNSU=[[25.035236,121.389524],[25.034750,121.389245],[25.033991
```

```javascript
                ,121.388494],
                    [25.034147,121.388237], [25.033350,121.387013],[25.03212
        5,121.388022],
                    [25.0317170,121.387464],[25.0319892,121.386692]];
        var loctoPO=[[25.035236, 121.389524],[25.032514, 121.39066]];


        function initialize() {
            var mapOptions = {
                center: new google.maps.LatLng(defaultLat,defaultLng),
                zoom: myZoom,
                mapTypeId: google.maps.MapTypeId.ROADP
            };
            // create map
            var map = new google.maps.Map(document.getElementById("map_canvas")
        ,mapOptions);

            // creates a draggable marker to the given coords
            var myMarker = new google.maps.Marker({
            position: new google.maps.LatLng(defaultLat, defaultLng),
            draggable: myMarkerIsDraggable
            });

            // waiting for service
            google.maps.event.addListener(myMarker, 'dragend', function(evt){
                var newLat=evt.latLng.lat().toFixed(myCoordsLenght);
                var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
                document.getElementById('latitude').value = newLat;
                document.getElementById('longitude').value = newLng;
                var loc2 = new google.maps.LatLng(newLat, newLng);
                document.getElementById('distanceAB').innerHTML =
                    Math.round(google.maps.geometry.spherical.computeDistanceBet
        ween (loc1, loc2))+'  m';
            });

            // centers the map on markers coords
            map.setCenter(myMarker.position);

            //myPath.setMap(map);

            // adds the marker on the map
            myMarker.setMap(map);
        }

        google.maps.event.addDomListener(window, 'load', initialize);

        document.getElementById('PosMenu').onchange = function() {
          var index = this.value; // array indices start at 0
          //alert(loc[index][0]);
```

```javascript
    var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
    document.getElementById('distanceAC').innerHTML =
    Math.round(google.maps.geometry.spherical.computeDistanceBetween (loc1,
loc2))+'  m';
    var newMarker = new google.maps.Marker({
      position: new google.maps.LatLng(loc[index][0], loc[index][1]),
      draggable: myMarkerIsDraggable
    });

    // centers the map on markers coords
    var mapOptions = {
            center: new google.maps.LatLng(defaultLat,defaultLng),
            zoom: myZoom,
            mapTypeId: google.maps.MapTypeId.ROADP
      };

     var map = new google.maps.Map(document.getElementById("map_canvas"),ma
pOptions)

    google.maps.event.addListener(newMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
      document.getElementById('latitude').value = newLat;
      document.getElementById('longitude').value = newLng;
      var loc2 = new google.maps.LatLng(newLat, newLng);
      document.getElementById('distanceAB').innerHTML =
        Math.round(google.maps.geometry.spherical.computeDistanceBetween (
loc1, loc2))+'  m';

    });
  // make the tracjectory
  if (index==0) {
    // Todo
    var coord =[];
    for (i = 0; i < loctoLib.length; i++) {
       coord.push(new google.maps.LatLng(loctoLib[i][0], loctoLib[i][1])
);
       }
  } else if (index==1) {
    var coord =[];
    for (i = 0; i < loctoNSU.length; i++) {
       coord.push(new google.maps.LatLng(loctoNSU[i][0], loctoNSU[i][1])
);
       }
  } else {
    //Todo
    var coord =[];
     for (i = 0; i < loctoPO.length; i++) {
```

```
            coord.push(new google.maps.LatLng(loctoPO[i][0], loctoPO[i][1]));
        }
    }

    var TrajPath= new google.maps.Polyline({
        path: coord,
        geodesic: true,
        strokeColor: '#FF0000',
        strokeOpacity: 0.8,
        strokeWeight: 2
     });
    TrajPath.setMap(map);

   //map.setCenter(newMarker.position);

   // adds the marker on the map
   newMarker.setMap(map)

}

</script>

</body>
</html>
```
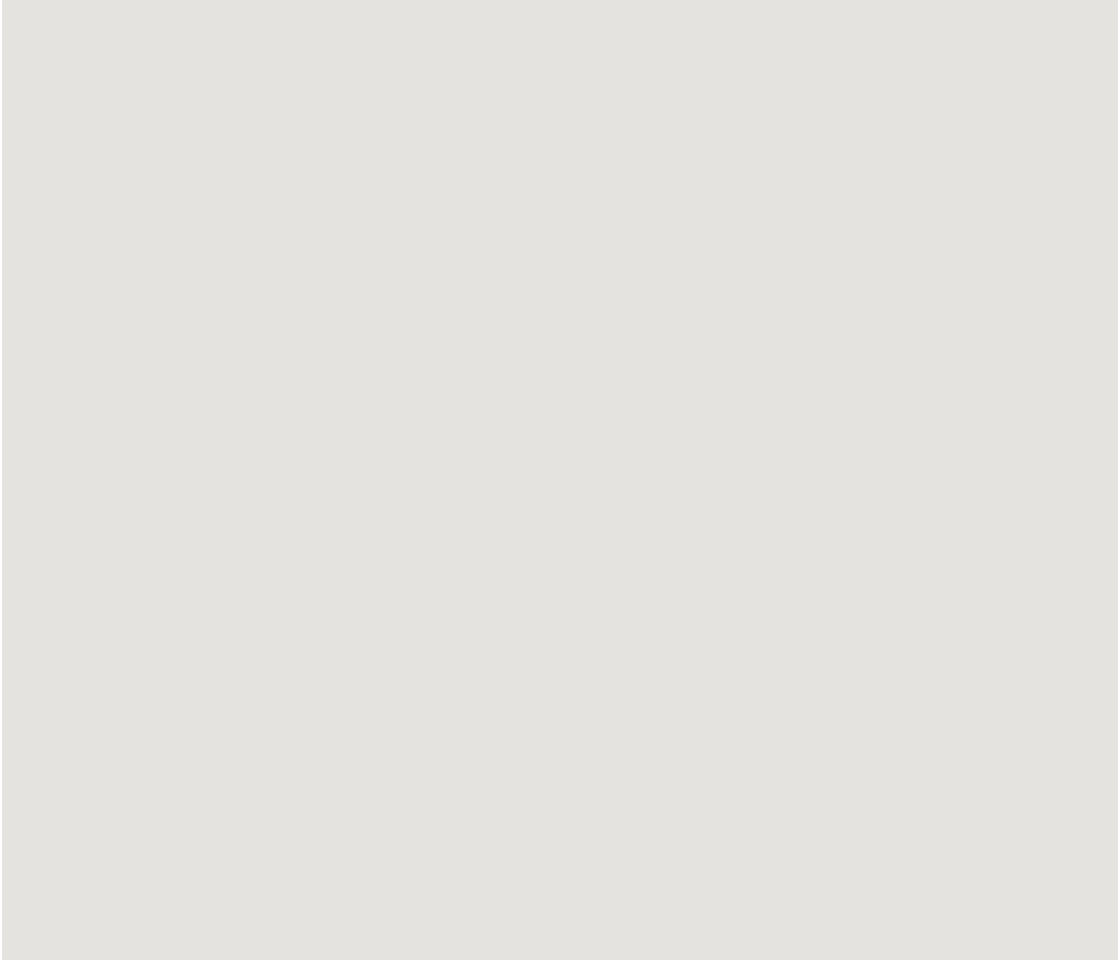
In [1]:

```
from IPython.display import IFrame
IFrame(src="GPScoord-5.html?key=AIzaSyCz0mwuPqDccvjhXOJ2Hh_ZvF9JAFB0iXo", width="
```

Out[1]:

The distance from Chang-Gung University to Destination [library ⇕]

In [ ]:

Animated Map

Create the animated trajetory of object

```
<!doctype html>
<html lang="en">
<head>
```

```html
        <meta charset="utf-8" />
        <meta name="viewport" content="width=device-width" />
        <title></title>
        <script type="text/javascript"
            src="http://maps.google.com/maps/api/js?sensor=true&v=3&libraries=
geometry"></script>

<style type="text/css">
    body {
        margin: 10;
        padding: 10
     }
    #map_canvas {
        position: absolute;
        width: 60%;
        height: 60%;
        left:20%;
        right:20%;
        top:30%;
        overflow: auto
    }
    div.vertical-text {
        -webkit-transform:rotate(90deg);
        -moz-transform:rotate(90deg);
        -o-transform: rotate(90deg);
        transform: rotate(90deg);
        transform-origin: left top 0;
        white-space:nowrap;
        display:block;
        bottom:0;
        width:20px;
        height:20px;
        font-family: 'Trebuchet MS', Helvetica, sans-serif;
        font-size:1.em;
        font-weight:normal;
        text-shadow: 0px 0px 1px #333;
    }
</style>
</head>

<body>

    <div id="map_canvas"></div>
    <br />
    <label for="latitude">Latitude:</label>
    <input id="latitude" type="text" value="" />
    <label for="longitude">Longitude:</label>
    <input id="longitude" type="text" value="" />
```

```
    <br><label>
    The distance from Chang-Gung University to Destination: <div id="dist
anceAB"></div>
    <label>
    <br>
      The distance from Chang-Gung University to Destination
      <select id="PosMenu">
              <option value="0">library</option>
              <option value="1">NSU</option>
              <option value="2">PO</option>
          </select>
      <div id="distanceAC"></div>
    <br><h3>Description: </h3><div id="description" class="vertical-text"
></div>
<script type="text/javascript">
// reference: https://developers.google.com/maps/documentation/javascript
/symbols

var myZoom = 16;
var myMarkerIsDraggable = true;
var myCoordsLenght = 6;
var defaultLat = 25.035255529260443;
var defaultLng = 121.389524;
var loc1 = new google.maps.LatLng(25.035255529260443, 121.389524);
var loc = [[25.034225,121.390168],[25.032047,121.386692],[25.032514, 121.
390661]];
var loctoLib=[[25.035236, 121.389524],[25.034225,121.390168]];
var loctoPO=[[25.035236, 121.389524],[25.032514, 121.39066]];

var loctoNSU=[[25.035236,121.389524],[25.034750,121.389245],[25.033991,12
1.388494],[25.034147,121.388237], [25.033350,121.387013],[25.032125,121.3
88022],[25.0317170,121.387464],
              [25.0319892,121.386692]];
var stringNSU=" The University nearby Chang-Gung University.";



var lineSymbol = {
    path: google.maps.SymbolPath.CIRCLE,
    scale: 8,
    strokeColor: '#393'
  };



function initialize() {
    var mapOptions = {
```

```javascript
        center: new google.maps.LatLng(defaultLat,defaultLng),
        zoom: myZoom,
        mapTypeId: google.maps.MapTypeId.ROADP
    };
    var map = new google.maps.Map(document.getElementById("map_canvas"),m
apOptions);
    // creates a draggable marker to the given coords   -3.118-3.118

    var myMarker = new google.maps.Marker({
    position: new google.maps.LatLng(defaultLat, defaultLng),
    draggable: myMarkerIsDraggable
    });


    google.maps.event.addListener(myMarker, 'dragend', function(evt){
        var newLat=evt.latLng.lat();
        var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
    document.getElementById('latitude').value = newLat;
    document.getElementById('longitude').value = newLng;
    var loc2 = new google.maps.LatLng(newLat, newLng);
        var distAB=Math.round(google.maps.geometry.spherical.computeDista
nceBetween (loc1, loc2));
        var timeestimated= Math.round(distAB/1.5/60);

    document.getElementById('distanceAB').innerHTML =
        distAB+'  m' + ' (about '+timeestimated+ ' by foot)' ;

    });

    // centers the map on markers coords
    map.setCenter(myMarker.position);

    //myPath.setMap(map);

    // adds the marker on the map
    myMarker.setMap(map);
}

google.maps.event.addDomListener(window, 'load', initialize);

document.getElementById('PosMenu').onchange = function() {
  var index = this.value; // array indices start at 0
  //alert(loc[index][0]);
  var loc2 = new google.maps.LatLng(loc[index][0], loc[index][1]);
  var distAB=Math.round(google.maps.geometry.spherical.computeDistanceBet
ween (loc1, loc2));
  var timeestimated= Math.round(distAB/1.5/60);
  document.getElementById('distanceAC').innerHTML =
```

```
            distAB+'  m' + ' (about '+timeestimated+ ' minutes walk by foot)'
;
   //document.getElementById('distanceAC').innerHTML =
   //Math.round(google.maps.geometry.spherical.computeDistanceBetween (loc
1, loc2))+'  m';
   var newMarker = new google.maps.Marker({
      position: new google.maps.LatLng(loc[index][0], loc[index][1]),
      draggable: myMarkerIsDraggable
   });

   // centers the map on markers coords
   var mapOptions = {
           center: new google.maps.LatLng(defaultLat,defaultLng),
           zoom: myZoom,
           mapTypeId: google.maps.MapTypeId.ROADP
      };

    var map = new google.maps.Map(document.getElementById("map_canvas"),ma
pOptions)

    google.maps.event.addListener(newMarker, 'dragend', function(evt){
         var newLat=evt.latLng.lat();
         var newLng=evt.latLng.lng().toFixed(myCoordsLenght);
      document.getElementById('latitude').value = newLat;
      document.getElementById('longitude').value = newLng;
      var loc2 = new google.maps.LatLng(newLat, newLng);
      document.getElementById('distanceAB').innerHTML =
         Math.round(google.maps.geometry.spherical.computeDistanceBetween (
loc1, loc2))+'  m';

      });
   // make the tracjectory
   if (index==0) {
     // Todo
      var coord =[];
      for (i = 0; i < loctoLib.length; i++) {
         coord.push(new google.maps.LatLng(loctoLib[i][0], loctoLib[i][1]
));
      };
      document.getElementById('description').innerHTML="Welcome!";
   } else if (index==1) {
     var coord =[];
     for (i = 0; i < loctoNSU.length; i++) {
         coord.push(new google.maps.LatLng(loctoNSU[i][0], loctoNSU[i][1])
);
         };
      document.getElementById('description').innerHTML=stringNSU;
   } else {
```

```javascript
        //Todo
        var coord =[];
        for (i = 0; i < loctoPO.length; i++) {
            coord.push(new google.maps.LatLng(loctoPO[i][0], loctoPO[i][1]
));
        };
        document.getElementById('description').innerHTML="Welcome!";
    }


    var TrajPath= new google.maps.Polyline({
        path: coord,
        geodesic: true,
        icons: [{
            icon: lineSymbol,
            offset: '100%'
        }],
        strokeColor: '#FF0000',
        strokeOpacity: 0.8,
        strokeWeight: 2,
        map: map
     });
    //TrajPath.setMap(map);
    animateCircle();
  map.setCenter(newMarker.position);


  // adds the marker on the map
  newMarker.setMap(map);


  function animateCircle() {
    var count = 0;
    window.setInterval(function() {
      count = (count + 1) % 200;

      var icons = TrajPath.get('icons');
      icons[0].offset = (count / 2) + '%';
      TrajPath.set('icons', icons);
  }, 20);
};


}
</script>

</body>
</html>
```
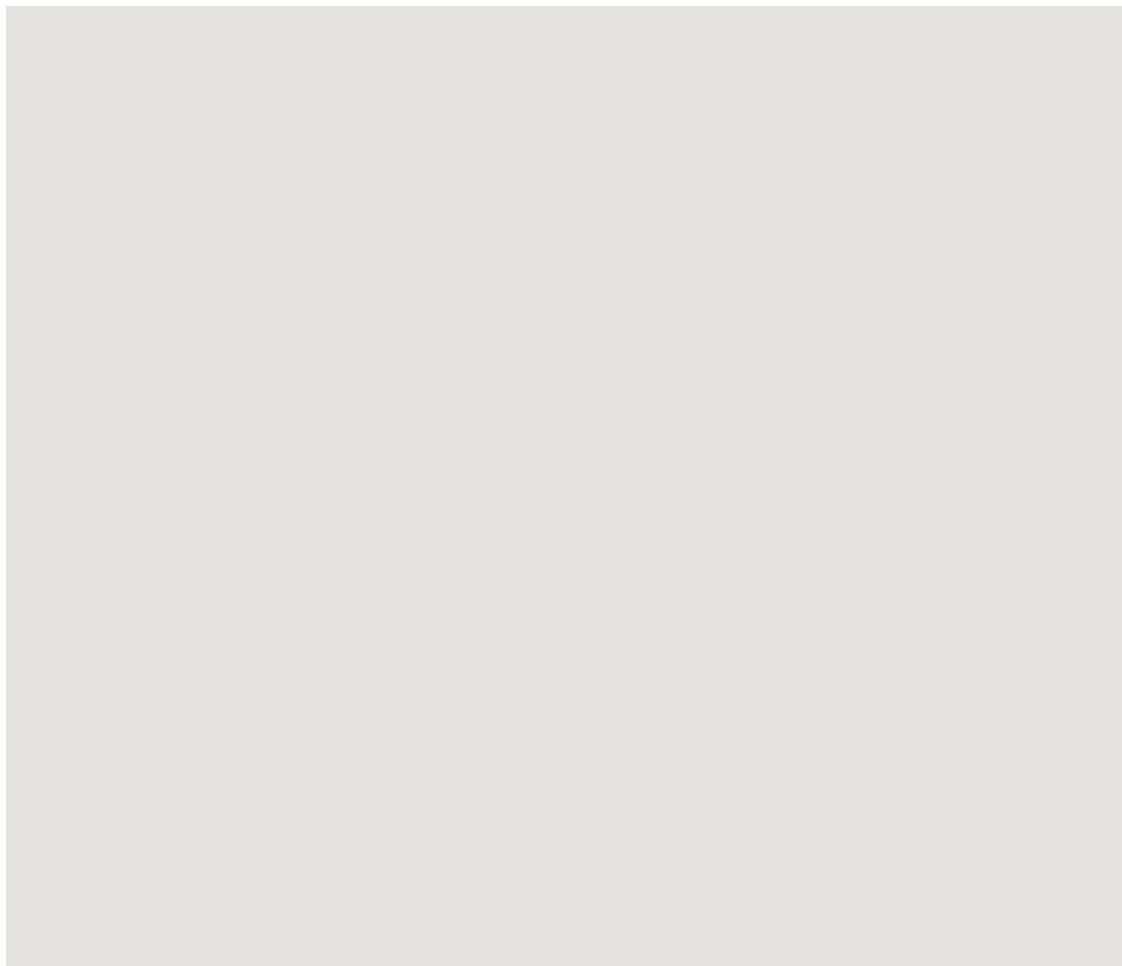
In [6]:

```
from IPython.display import IFrame
IFrame(src="GPScoord-7.html", width="800px", height="600px" )
```

Out[6]:

The distance from Chang-Gung University to Destination library ⌄

Description:

In [10]:

```
!jupyter nbconvert --to html GoogleMap.ipynb
```

```
[NbConvertApp] Converting notebook GoogleMap.ipynb to html
[NbConvertApp] Writing 1148173 bytes to GoogleMap.html
```

In [ ]:

In [ ]: