

GoogleMap

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

- Howto: basic requirement of using Google Map App
- Template: A simple demo of app using Google Map
- Mark the Position: anchor the position
- Marker
- Demo: Demo of Marker Draggable

Howto

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

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.ROADMAP
    };
    // location at which the map is displayed
    var map = new google.maps.Map(document.getElementById("map_canvas"),
        mapOptions);
}
```

1. Run the code while loaded

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

Template

A simple demo:

```
<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_canvas
"),
            mapOptions);
    }

</script>
</head>
<body onload="initialize()">
    <div id="map_canvas" 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_canvas {
        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 poosition:

```

<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....

```
<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 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

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

```
<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';
});

```

Make a note via Google Map

Create an array of latitude/longitude list for which we are interested. Move the marker to the place which we select from the HTML options.

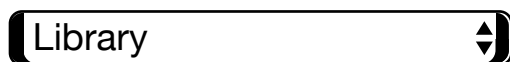
- create the html options

```

<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:



A screenshot of a web browser showing a dropdown menu. The menu is open, and the word 'Library' is selected and displayed in the input field. The dropdown menu is styled with a light blue background and a dark border. The selected item 'Library' is highlighted in a darker blue. The dropdown menu is positioned below the input field.

- 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.computeDistanceBetween
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.computeDistanceBetween
n (loc1, loc2))+ ' m';
        });

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

```

In [3]:

```
%%bash
```

```
cat GPSCoord-3.html
```

```

<!doctype html>
<html lang="en">
<head>
    <meta charset="utf-8" />
    <title></title>
    <script type="text/javascript"
        src="http://maps.google.com/maps/api/js?sensor=true&v=3&li
braries=geometry"></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="" />

    <br><label>
    The distance from Chang-Gung University to Destination: <div
id="distanceAB"></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,
121.390661]];

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    -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 (lo
c1, 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 (
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
"),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 (lo
c1, loc2))+ ' m';
```

```
});
```

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

```
// adds the marker on the map
```

```
newMarker.setMap(map)
```

```
}  
</script>
```

```
</body>  
</html>
```

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 square 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>
  <input id="longitude" type="text" value="" />

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

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
    });

    // 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"),m
apOptions)

    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);

    // 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>Latitude and Longitude</title>
  <script type="text/javascript" src="http://maps.google.com/maps/api/
js?sensor=true" >
    </script>
</head>
```

code1-2

```

<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>

```

```

<script>
    // This example creates a simple polygon representing the library building 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' ),mapOptions);

        // 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 the polygon.
        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

```

<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.getPath());
        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 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

```

```
,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]);
    }

```

```

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"),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';

});
// 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 [5]:

```
from IPython.display import IFrame
IFrame(src="GPScoord-5.html", width="800px", height="600px" )
```

Out[5]:

The distance from Chang-Gung University to Destination

library



In []:

Animated Map

Create the animated trajetory of object

```
<!doctype 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
    }
    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="distanceAB"></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],[25.033991,121.388494],[25.034147,121.388237], [25.033350,121.387013],[25.032125,121.388022],[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 = {

```

```

        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    -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.computeDistanceBetween (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.computeDistanceBetween (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 {

```

```

    //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

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 []: