1 GoogleMap

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

Since Aug 2018, Google has changes the google map development policy, no more free policy: developers have to register an account, binging with ones' credit card. This causes trouble for map developers. We try to overcome this problem by replacing GoogleMap by OpenStreetMap, OPenLayer. And integrated with the help of html geolocation, we try to recreate the map app again. (2019/05)

- Howto: basic requirement of using Goole Map App
- Template: A simple demo of app using Google Map
- Mark the Position: anchor the position
- Marker
- Demo; Demo of Marker Draggable
- How Far from Here Distance Measurement
- Area Estimation Estimate the Area of polygon
- Make Note List of Locations
- Map Animating Create a Marauders-Maps
- OpenMap Map app comes back!

1.1 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=tru
e&language=tw&v=3" >
 </script>
```

option "sensor=true": use mobile device

2. **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.getElemen
tById("map_canvas"),
               mapOptions);
        }
```

3. **Run the code while loaded**

```
        <body onload="initialize()">
        <div id="map_canvas" style="width: 600px;height: 40
0px;" />
```

1.2 Note

Here, type of maps is ROADP; other formats are

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

1.3 Template

A simple demo:

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

```
<script type="text/javascript">
      function initialize() {
        var mapOptions = {
          center: new google.maps.LatLng(25.034264,121.3893
95),
          zoom: 16,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementBy
Id("map"),
            mapOptions);
      }

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

1.4 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.

1.5 MarkThePosition

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

```
        var CGU_latlng = new google.maps.LatLng(25.034264,1
    21.389395);
```

2. create marker:

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

1.6 Marker

```
<script type="text/javascript">
    window.onload = function () {
      // initialize Google Map
      var latlng = new google.maps.LatLng(25.034264,121.389
395);
      var mapOptions = {
          zoom:12,
          center:latlng,
          mapTypeId: google.maps.MapTypeId.ROADMAP
      };
      var gmap = new google.maps.Map(document.getElementByI
d("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>
```

1.7 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.

1.8 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:

1.9 JavaScript part

"HTML PART" Here....

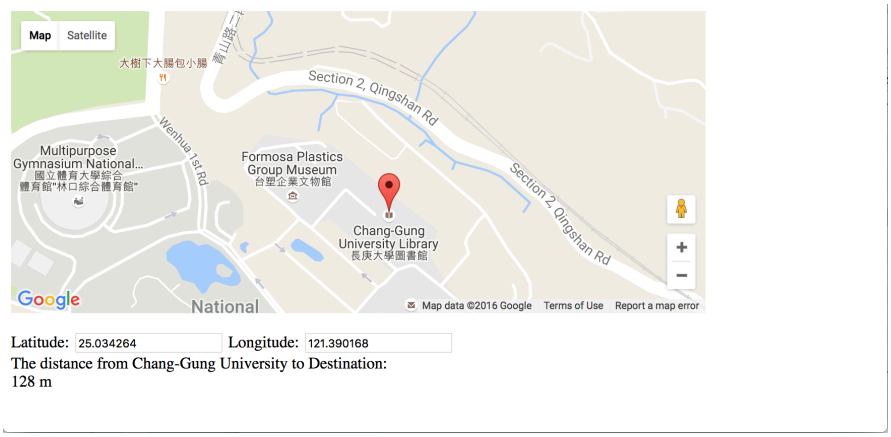
```
    <script type="text/javascript">
      var myCoordsLenght = 6;
      var defaultLat = 25.034264;
      var defaultLng = 121.389395;

      function initialize() {
         var mapOptions = {
             ...
         };
         var map = new google.maps.Map(document.getElementB
yId("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 = ev
t.latLng.lat();
             document.getElementById('longitude').value = e
vt.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', init
ialize);
    </script>
```

1.10 Completed Codes

```
<html lang="en">
<head>
   <meta charset="utf-8" />
   <script type="text/javascript" src="http://maps.google.c
om/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,defaultL
ng),
         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, defau
ltLng),
         draggable: true
     });

     google.maps.event.addListener(myMarker, 'dragend', fun
ction(evt){
         document.getElementById('latitude').value = evt.la
tLng.lat();
         document.getElementById('longitude').value = evt.l
atLng.lng().toFixed(myCoordsLenght);
     });

     map.setCenter(myMarker.position);
     myMarker.setMap(map);
  }
  google.maps.event.addDomListener(window, 'load', initiali
```

```
ze);
</script>
</body></html>
```



1.11 Application

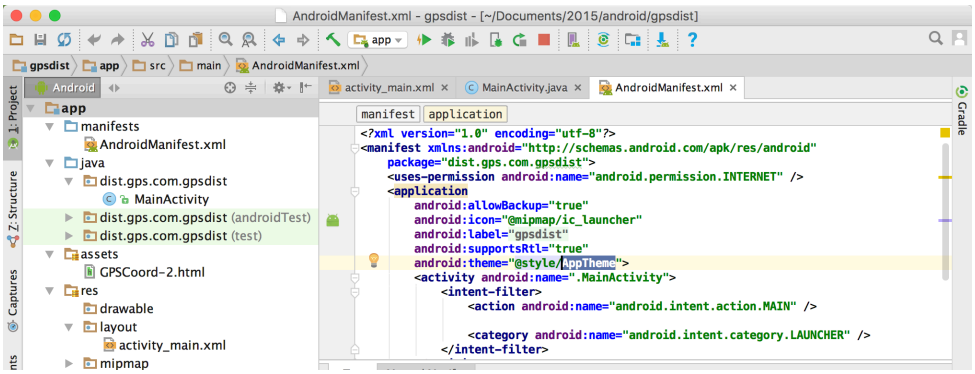
- Make Survey (get data in csv format)
- make map of survey data (by scratch or by Python)

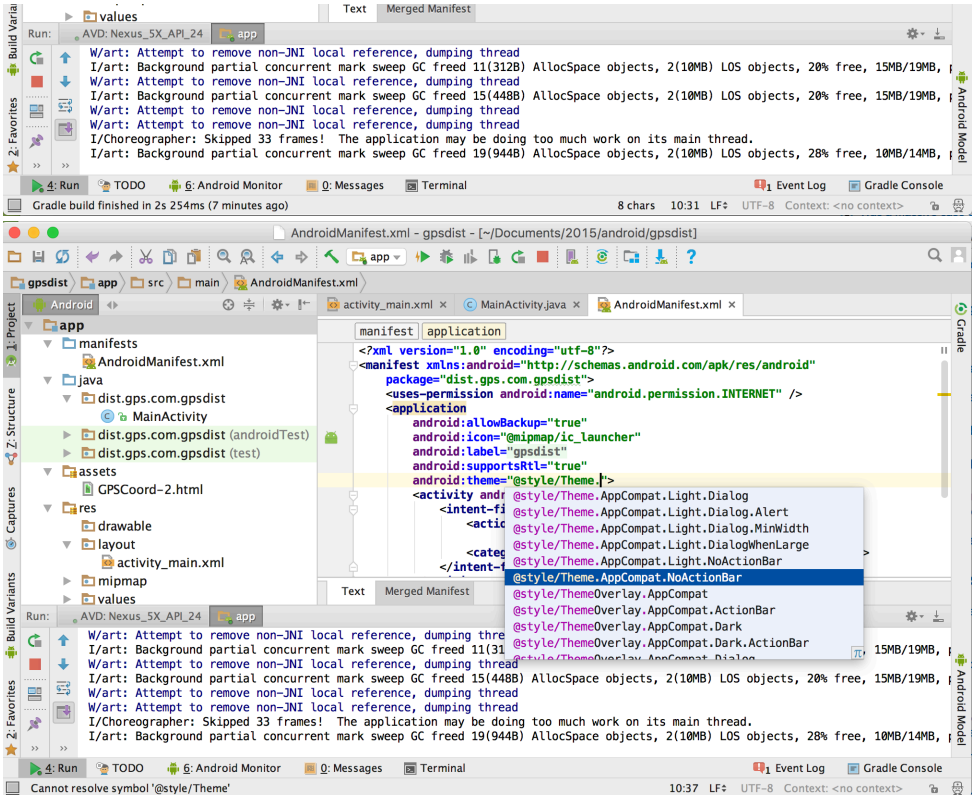
```
------------------------------------------------------------
----------------------
NameError                                 Traceback (m
ost recent call last)
<ipython-input-3-421e654598d9> in <module>
----> 1 IFrame(src="ntufolium.html", width="800px",
height="500px" )

NameError: name 'IFrame' is not defined
```

1.12 Note

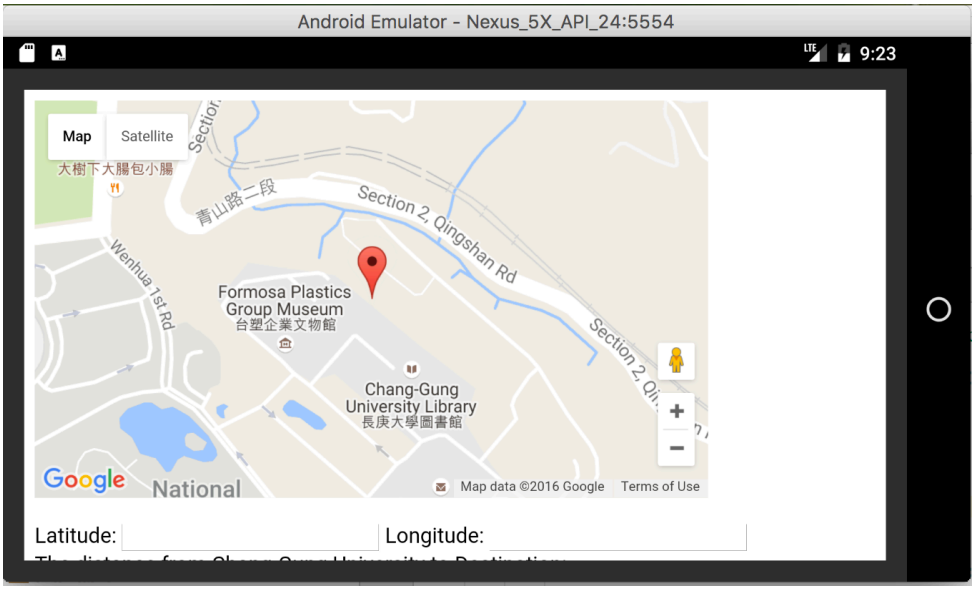
1. How to get rid of app title bar?

So small to display the unnecessary info. Modify the default setting of Theme in AndroidManifest.xml:





1.13 The result



1.14 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&libraries=geometry"></script>
        </head>
```

2. where the measurement is placed:

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

3. 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(myCoordsLeng
ht);
           document.getElementById('latitude').value = newL
at;
           document.getElementById('longitude').value = new
Lng;
           var loc2 = new google.maps.LatLng(newLat, newLng
);
           document.getElementById('distanceAB').innerHTML
=
                Math.round(google.maps.geometry.spherical.c
omputeDistanceBetween (loc1, loc2))+'  m';
        });
```

1.15 Sketch

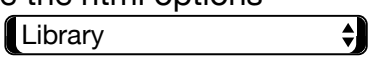
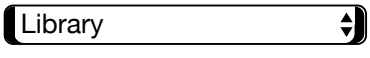
```
                HTML
            defaulted Lat/Lng
```

```
JavaScript

     Latitude: (defaultLat)  Longitude: (defaultLng)    goo
gle.maps.event.addListener(,,function(evt))
                    |                          |
:
                    |                          |
:
                    ▼                          ▼
:
                  newLat                     newLng
:    waiting for position changed
                    ▲                          ▲
:
                    |                          |
:
             evt.latLng.lat()  ◄-..  evt.latLng.lng() ◄-----
------- ┤    If dragged

:

:
            <div id="distanceAB">     </div>
:
                                   ▲
:                                  └ ----------------------
--------┘

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

1.15.1 Make a note via Google Map

Codes, GPSCoord-3.html (GPSCoord-3.html)

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
  ```html 

  —
  " ```

Result:


—

- Array in Javascript
  ```

```
  var loctoLib=[[25.035236, 121.389524],[25.034225,121.3
90168]];
  var loctoPO=[[25.035236, 121.389524],[25.032514, 121.3
9066]];
  var loctoNSU=[[25.035236,121.389524],[25.034750,121.38
9245],[25.033991,121.388494],[25.034147,121.388237], [25
.033350,121.387013],[25.032125,121.388022],[25.0317170,1
21.387464],
           [25.0319892,121.386692]];
```

- show the marker at the place on the map while option was selected (i.e. `[Element]`.onchange):

```
    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.compute
DistanceBetween (loc1, loc2))+'  m';
       var newMarker = new google.maps.Marker({
          position: new google.maps.LatLng(loc[index][0], l
oc[index][1]),
          draggable: myMarkerIsDraggable
```

```
        });

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

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

        google.maps.event.addListener(newMarker, 'dragend',
function(evt){
            var newLat=evt.latLng.lat();
            var newLng=evt.latLng.lng().toFixed(myCoordsLengh
t);
            document.getElementById('latitude').value = newLa
t;
            document.getElementById('longitude').value = newL
ng;
            var loc2 = new google.maps.LatLng(newLat, newLng)
;
            document.getElementById('distanceAB').innerHTML =
            Math.round(google.maps.geometry.spherical.compute
DistanceBetween (loc1, loc2))+'  m';
        });

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

- create the chosen tracjectory

```
        if (index==0) {
            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 {
          var coord =[];
          for (i = 0; i < loctoPO.length; i++) {
              coord.push(new google.maps.LatLng(loctoPO[i][
   0], loctoPO[i][1]));
          }
        }
```

1.16 PositionMarker

```
<script type="text/javascript">
window.onload = function () {
    var latlng = new google.maps.LatLng(25.034264,121.38939
5);
    var mapOptions = {
        zoom:12,
        center:latlng,
        mapTypeId: google.maps.MapTypeId.ROADMAP
    };
    var gmap = new google.maps.Map($("map_canvas"), mapOpti
ons);

    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" />
```

- Make the trajectory:

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

1.17 Complete Code

Show the distance of destiny positions

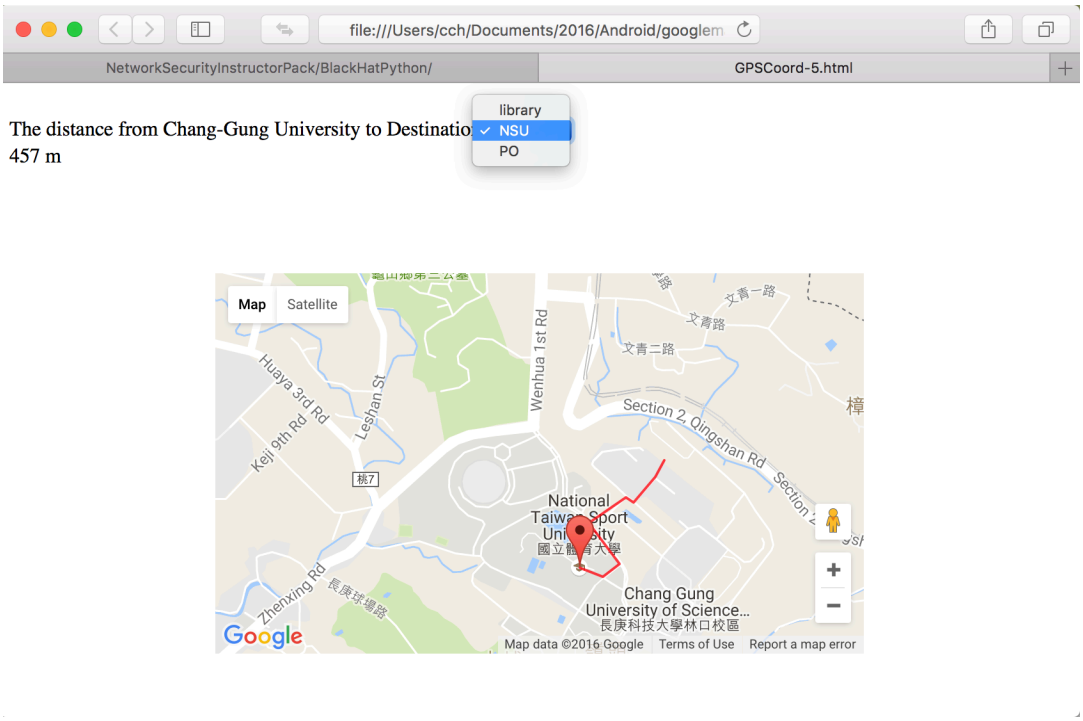
```
<html lang="en">
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width" />
    <title></title>
    <script type="text/javascript"
       src="http://maps.google.com/maps/api/js?sensor=true&
v=3&libraries=geometry"></script>

<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="distanceAB"></div>
    <label>
    <br>
      The distance from Chang-Gung University to Destinatio
n
      <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,default
Lng),
          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', func
tion(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.computeDis
tanceBetween (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', initiali
ze);

  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[in
dex][1]);
    document.getElementById('distanceAC').innerHTML =
    Math.round(google.maps.geometry.spherical.computeDistan
ceBetween (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,default
Lng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
    };

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

    google.maps.event.addListener(newMarker, 'dragend', fun
ction(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.compute
```

```
DistanceBetween (loc1, loc2))+'  m';
    });

    map.setCenter(newMarker.position);


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

</script>

</body>
</html>
```

1.18 Result



1.19 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.

1.20 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>
```

1.21 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,default
Lng),
          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', func
tion(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', initiali
ze);
</script>
</body>
```

1.22 Code 2-1

```
<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,default
Lng),
          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 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', initiali
ze);
  </script>
```

1.23 Code2-2

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

1.24 Code3-1

```
<script type="text/javascript"
    src="https://maps.googleapis.com/maps/api/js?libraries=
geometry&sensor=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,default
Lng),
          zoom: myZoom,
          mapTypeId: google.maps.MapTypeId.ROADP
        };
        var map = new google.maps.Map(document.getElementBy
Id("map_canvas"),mapOptions);
    }
    google.maps.event.addDomListener(window, 'load', initia
lize);
</script>
```

1.25 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(my
polygon.getPath());
        alert(z); //this is not working
    }
</script>
```

1.26 Code3-3

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

2 Practice

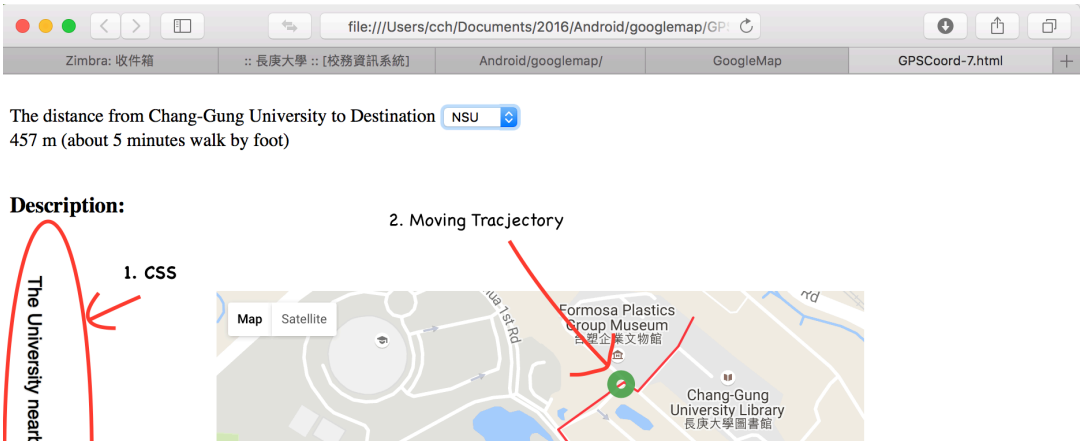
Make a squre around your dormitory and estimate the base area of the building.

2.1 Marauders Maps

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

2.2 Animated Map

To create the animated trajetory of object, we make some changes from the last example, make notes.



1. First for

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

Here the syntax for CSS

- `tag {...}` : function on HTML's `<tag>` ;
- `#name {...}` : function on HTML's tag with `id/name="name"` ;
- `div.vertical-text {...}` : function on HTML's tag, `<div class='vertical-text >`';

2. create a moving object, small circle ○, which runs on the chosen trajectory:

```
    <script type="text/javascript">
    ...
       var lineSymbol = {
           path: google.maps.SymbolPath.CIRCLE,
           scale: 8,
           strokeColor: '#393'
       };
    ...
       var myMarker = new google.maps.Marker({
         ...
           animation: google.maps.Animation.DROP
       });
       google.maps.event.addListener(myMarker, 'click', toggleB
    ounce);

       function toggleBounce() {
           if (myMarker.getAnimation() != null) {
              myMarker.setAnimation(null);
           } else {
            myMarker.setAnimation(google.maps.Animation.BOUNCE)
    ;
           }
        };
```

- Marker can be animated by two ways:
  - DROP: jump to the end;
  - BOUNCE: move while animation is *null*.
- While initialized, set Marker is DROP,
- set Listener on mouse `click` event; if `on` , continuously `jump` ing while animation becomes null.

3. Determine the position of moving marker and refresh map; the respose requires a new function, `animateCircle()` , to refresh the marker position every **20** milli-second:

```
<script type="text/javascript">
...
   var TrajPath= new google.maps.Polyline({
      ...
      icons: [{
         icon: lineSymbol,
         offset: '100%'
      }],
      ...
      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>
```

2.3 OpenMap

Using OpenMap solution, requires

1. implement javascript `getgeolocation` , (by navigator.geolocation), to check whether the geolocation is supported, MAC safari not supported.
2. acclaim new map at certain latitude/longtitude.

Here, we want to introduce an example, `where am I?` , in which we could find the place we locate now.

Details

1. HTML outline

```
<html>
 <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width,
          initial-scale=1.0, maximum-scale=1.0, user-sca
lable=no" />
    <script src="http://www.openlayers.org/api/OpenLayer
s.js"></script>
 </head>
 <script>
     //pre-defined javascript fiunctions placed here
     function getLocation(){// check wheter geoloaction
supported  }
     function getPosition(position){// get the (lat,lng)
}

     function getPosition1(lat,lng){ // generate map }
 </script>
 <style>
     body {
          margin: 10;
          padding: 10
     }
     #mapdiv {
        position: relative;
        width: 60.0%;
        height: 60.0%;
        left:20%;
        right:20%;
        top:20%;
        overflow: auto;
     }
 </style>
 <body>
     <!-- main content -->
 </body>
</html>
```

2. generate Open Map:

```
function getPosition1(lat,lng){
          map = new OpenLayers.Map("mapdiv");
          map.addLayer(new OpenLayers.Layer.OSM());

          var lonLat = new OpenLayers.LonLat(lng,lat).tra
nsform(
                new OpenLayers.Projection("EPSG:4326"), /
/ transform from WGS 1984
                map.getProjectionObject() // to Spherical
Mercator Projection
          );

          var zoom=17;
          var markers = new OpenLayers.Layer.Markers( "Ma
rkers");
          map.addLayer(markers);
          markers.addMarker(new OpenLayers.Marker(lonLat)
);
          map.setCenter (lonLat, zoom);
      }
```

3. get lat/lng if geolocation supported

```
function getPosition(position){
          // get the (lat,lng)
          lat=position.coords.latitude;
          lng=position.coords.longitude;
          document.getElementById("latitude").value = l
at.toFixed(6) ;
          document.getElementById("longitude").value =
lng.toFixed(6);

          // map re-generate
          document.getElementById("mapdiv").innerHTML =
"";
          getPosition1(lat,lng);
      }
```

4. check whether geolocation supported,

```
function getLocation(){
          // Check whether browser supports Geolocation A
PI or not
          if (navigator.geolocation) { // Supported
              // To add PositionOptions
```

```
                // To add PositionOptions
                navigator.geolocation.getCurrentPosition(get
Position);
            } else { // Not supported
                    alert("Oops! This browser does not sup
port HTML Geolocation.");
            }
            getPosition();
        }
```

5. html body, create two columns for latitude and longitude, one button for click to get the location, and finally generate the map where we locate:

```
        <h1>Finding Me</h1>
        <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="" value="" />
        <button onclick="getLocation()">Where am I?</butto
n>

        <div id="mapdiv"></div>

        <script>
            getPosition1(25.048834785146223,121.514365);
        </script>
```

While click the buttom, Choose [Allow] in popup windows to allow app to get the location.