

16. 口罩地圖製作使用OSM



makmap

以下範例教學如何使用健保局開放資料，結合OpenStreetMap製作口罩地圖！

1. 版面設定



整體區域化劃分為3:9

```
<div class="container-fluid">
  <div class="row">
    <div class="col-md-3 bg-success">
    </div>
    <div class="col-md-9 bg-warning">
      <div id="map"></div>
    </div>
  </div>
</div>
```

縣市鄉鎮顯示區已select顯示

```
<div class="form-group d-flex my-2">
  <label for="exampleFormControlSelect1" class="col-3 my-2 font-weight-bold">
    <span>縣市</span>
  </label>
  <select class="form-control col-9" id="exampleFormControlSelect1">
    <option>台北市</option>
    <option>台中市</option>
  </select>
</div>
```

藥局資料以list-group顯示

```

<ul class="list-group region_list">
  <li class="list-group-item">
    <p class="h3 font-weight-bold">XX藥局</p>
    <p class="h4">地址: XXXXXXXXX</p>
    <p class="h4">電話: XXXXXXXXXXXXX</p>
    <p>成人口罩: 99個 | 兒童口罩: 99個</p>
  </li>
  <li class="list-group-item">☐
  </li>
  <li class="list-group-item">☐
  </li>
  <li class="list-group-item">☐
  </li>
</ul>

```

設定scroll

```

.region_list{
  height: 80vh;
  overflow: scroll;
}

```

2. 縣市鄉鎮資料取得

由於縣市名稱資料變動性不大，因此無須每次都從外部資料抓取，較便利的方式法為將資料放置本地端直接取用！

<https://github.com/donma/TaiwanAddressCityAreaRoadChineseEnglishJSON>

放入本地端後載入並console.log確認資料是否正確

```

▼ Array(24) ⓘ
  ▼ 0:
    ▼ AreaList: Array(12)
      ▶ 0: {ZipCode: "100", AreaName: "中正區", AreaEngName: "Zhongzheng Dist."}
      ▶ 1: {ZipCode: "103", AreaName: "大同區", AreaEngName: "Datong Dist."}
      ▶ 2: {ZipCode: "104", AreaName: "中山區", AreaEngName: "Zhongshan Dist."}
      ▶ 3: {ZipCode: "105", AreaName: "松山區", AreaEngName: "Songshan Dist."}
      ▶ 4: {ZipCode: "106", AreaName: "大安區", AreaEngName: "Da'an Dist."}
      ▶ 5: {ZipCode: "108", AreaName: "萬華區", AreaEngName: "Wanhua Dist."}
      ▶ 6: {ZipCode: "110", AreaName: "信義區", AreaEngName: "Xinyi Dist."}
      ▶ 7: {ZipCode: "111", AreaName: "士林區", AreaEngName: "Shilin Dist."}
      ▶ 8: {ZipCode: "112", AreaName: "北投區", AreaEngName: "Beitou Dist."}
      ▶ 9: {ZipCode: "114", AreaName: "內湖區", AreaEngName: "Neihu Dist."}
      ▶ 10: {ZipCode: "115", AreaName: "南港區", AreaEngName: "Nangang Dist."}
      ▶ 11: {ZipCode: "116", AreaName: "文山區", AreaEngName: "Wenshan Dist."}
      length: 12
      __proto__: Array(0)
    CityEngName: "Taipei City"
    CityName: "臺北市"
    __proto__: Object
  ▶ 1: {CityName: "基隆市", CityEngName: "Keelung City", AreaList: Array(7)}
  ▶ 2: {CityName: "新北市", CityEngName: "New Taipei City", AreaList: Array(29)}
  ▶ 3: {CityName: "連江縣", CityEngName: "Lienchiang County", AreaList: Array(4)}
  ▶ 4: {CityName: "宜蘭縣", CityEngName: "Yilan County", AreaList: Array(13)}
  ▶ 5: {CityName: "釣魚臺", CityEngName: "Diauyutai", AreaList: Array(1)}
  ...

```

3. 綁定縣市select選單資料

```
<script>
    console.log(city);
    $("#CityName").empty();
    city.forEach(function(item){
        console.log(item.CityName);
        var strHTML = '<option value="'+item.CityName+'">'+item.CityName+'</option>';
        $("#CityName").append(strHTML);
    });
</script>
```



綁定鄉鎮區資料

```
var selectCity = ''; //存儲取得縣市
var selectConuty = []; //存儲取得鄉鎮區

// 綁定縣市select選單資料
$("#CityName").empty();
city.forEach(function(item){
    // console.log(item.CityName);
    var strHTML = '<option value="'+item.CityName+'">'+item.CityName+'</option>';
    $("#CityName").append(strHTML);
});

//監聽select選單資料是否有改變
$("#CityName").change(function(){
    selectCity = $(this).val();
    //取得該縣市資料並搬入selectConuty
    city.find(function(item){
        if(item.CityName == selectCity){
            selectConuty = item.AreaList;
        }
    });
    //綁定鄉鎮區資料
    $("#AreaName").empty();
    selectConuty.forEach(function(item){
        var strHTML = '<option value="'+item.AreaName+'">'+item.AreaName+'</option>';
        $("#AreaName").append(strHTML);
    });
});
```



4. 取得健保局開放資料

<https://raw.githubusercontent.com/kiang/pharmacies/master/json/points.json>

```
{
  "type": "FeatureCollection",
  "features": [
    {
      "type": "Feature",
      "properties": {
        "id": "5945030094",
        "name": "德興藥局",
        "phone": "(03)8889408",
        "address": "花蓮縣玉里鎮國武里中山路2段58號",
        "mask_adult": 0,
        "mask_child": 1200,
        "updated": "2020/11/30 14:14:27",
        "available": "星期一上午看診、星期二上午看診、星期三上午看診、星期四晚上看診、星期二晚上看診、星期三晚上看診、星期四晚上看診、星期五晚上看診、星期六晚上看診、星期日晚上看診、",
        "note": "口罩販售，營業時間，成人口罩200份，兒童口罩20份，售完:",
        "custom_note": "",
        "website": "",
        "county": "花蓮縣",
        "town": "玉里鎮",
        "cunli": "國武里",
        "service_periods": "NNNNNNNNNNNNNNNNNNNNNNNN"
      },
      "geometry": {
        "type": "Point",
        "coordinates": [
          121.315149,
          23.333096
        ]
      }
    }
  ]
}
```

將健保局開放資料載入儲存於cityData

以console.log 共 5615筆

5. 綁定所選取的鄉鎮區藥局資料於list-group

過濾所選取的鄉鎮區藥局並綁定於list-group


```
//存儲過濾後單一鄉鎮區健保局開放資料儲存於listData
$("#AreaName").change(function(){
    selectTown = $(this).val();

    var listData = []; //存儲過濾後單一鄉鎮區健保局開放資料
    cityData.forEach(function(item){
        if(item.properties.county == selectCity && item.properties.town == selectTown){
            listData.push(item);
        }
    });

    //綁定所選取的鄉鎮區藥局資料於list-group
    $("#region_list").empty();
    listData.forEach(function(item){
        var strHTML = '<li class="list-group-item"><p class="h3 font-weight-bold">'+item.
            properties.name+'</p><p class="h4">地址: '+item.properties.address+'</p><p
            class="h4">電話: '+item.properties.phone+'</p><p>成人口罩: '+item.properties.
            mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</p></li>';
        $("#region_list").append(strHTML);
    });
});
```

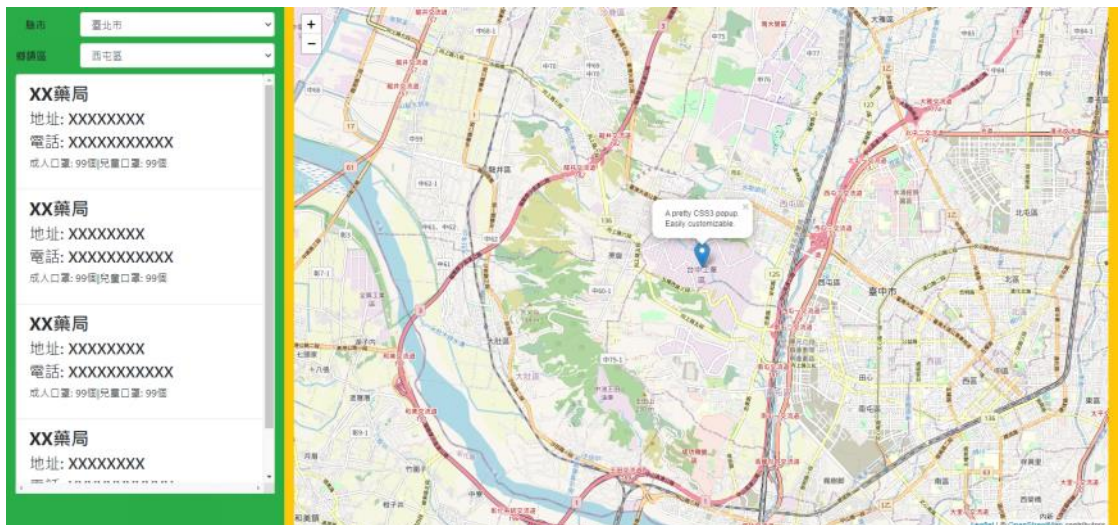
6. 顯示地圖OSM

<https://leafletjs.com/>

```
//地圖
var map = L.map('map').setView([24.168515,120.5997279], 13);

L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
    attribution: '&copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a>
        contributors'
}).addTo(map);

L.marker([24.168515,120.5997279]).addTo(map)
    .bindPopup('A pretty CSS3 popup. <br> Easily customizable.')
    .openPopup();
```



7. Marker 搭配藥局數量呈現，與 list-group 同時渲染至地圖

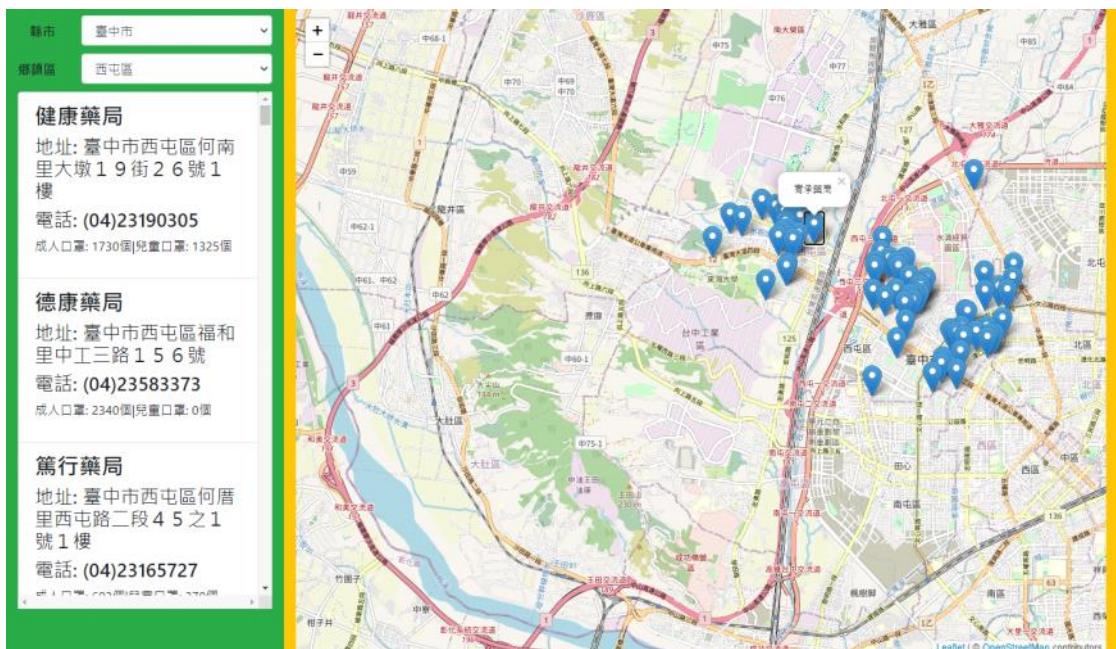
```
//存儲過濾後單一鄉鎮區健保局開放資料儲存於listData
$("#AreaName").change(function(){
    selectTown = $(this).val();

    var listData = []; //存儲過濾後單一鄉鎮區健保局開放資料
    cityData.forEach(function(item){
        if(item.properties.county == selectCity && item.properties.town == selectTown){
            listData.push(item);
        }
    });

    //綁定所選取的鄉鎮區藥局資料於list-group
    $("#region_list").empty();
    listData.forEach(function(item){
        var strHTML = '<li class="list-group-item"><p class="h3 font-weight-bold">'+item.
            properties.name+'</p><p class="h4">地址: '+item.properties.address+'</p><p
            class="h4">電話: '+item.properties.phone+'</p><p>成人口罩: '+item.properties.
            mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</p></li>';
        $("#region_list").append(strHTML);

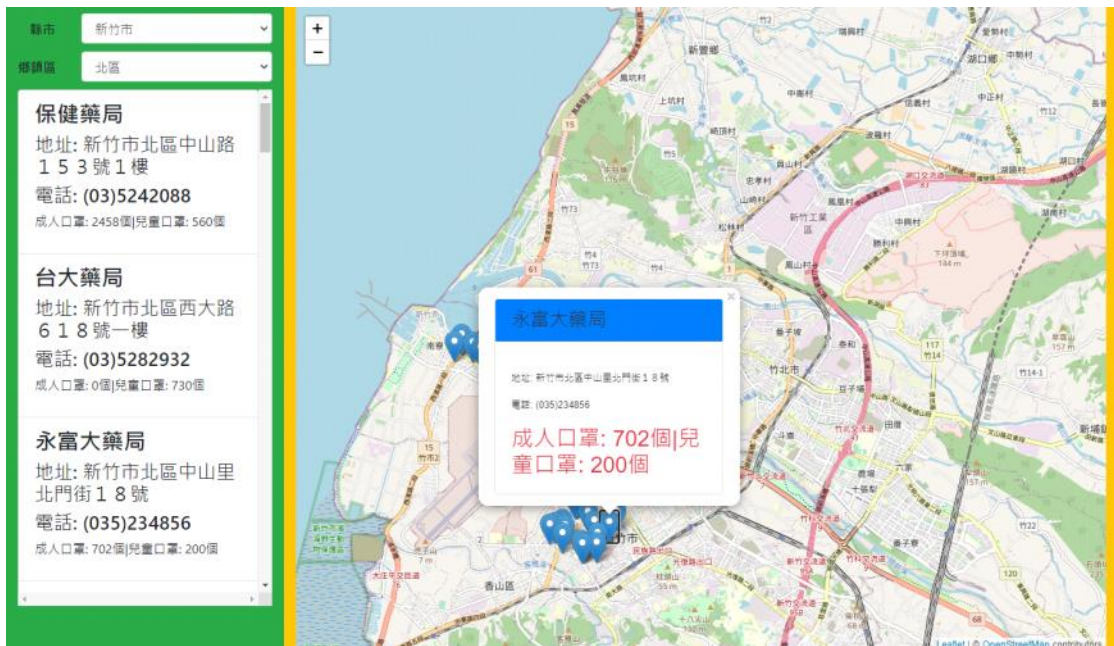
        var lat = item.geometry.coordinates[1];
        var lng = item.geometry.coordinates[0];

        L.marker([lat, lng]).addTo(map)
            .bindPopup(item.properties.name)
            .openPopup();
    });
});
```



美化popup 以card呈現

```
L.marker([lat, lng]).addTo(map)
    .bindPopup('<div class="card" style="width: 18rem;"><h4 class="card-header
    bg-primary">'+item.properties.name+'</h4><div class="card-body"><p
    class="card-text">地址: '+item.properties.address+'</p><p class="card-text">電話:
    '+item.properties.phone+'</p><h3 class="card-text text-danger">成人口罩: '+item.
    properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+'
    個</h3></div></div>')
    .openPopup();
```

8. 移除上一個區域的marker

```
//綁定所選取的鄉鎮區藥局資料於list-group
$("#region_list").empty();
removeMarker();
listData.forEach(function(item){
    var strHTML = '<li class="list-group-item"><p class="h3 font-weight-bold">'+item.
        properties.name+'</p><p class="h4">地址: '+item.properties.address+'</p><p
        class="h4">電話: '+item.properties.phone+'</p><p>成人口罩: '+item.properties.
        mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</p></li>';
    $("#region_list").append(strHTML);

    var lat = item.geometry.coordinates[1];
    var lng = item.geometry.coordinates[0];

    L.marker([lat, lng]).addTo(map)
        .bindPopup('<div class="card" style="width: 18rem;"><h4 class="card-header
        bg-primary">'+item.properties.name+'</h4><div class="card-body"><p
        class="card-text">地址: '+item.properties.address+'</p><p class="card-text">電話:
        '+item.properties.phone+'</p><h3 class="card-text text-danger">成人口罩: '+item.
        properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+'
        個</h3></div></div>');
});
```

```
//清除MARKER
function removeMarker(){
    map.eachLayer(function(layer){
        if(layer instanceof L.Marker){
            map.removeLayer(layer);
        }
    });
}
```

9. 變換區域時地圖轉移

利用key值得中位數轉移地圖


```
listData.forEach(function(item, key){
    var strHTML = '<li class="list-group-item"><p class="h3 font-weight-bold">'+item.
        properties.name+'</p><p class="h4">地址: '+item.properties.address+'</p><p
        class="h4">電話: '+item.properties.phone+'</p><p>成人口罩: '+item.properties.
        mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</p></li>';
    $("#region_list").append(strHTML);

    var lat = item.geometry.coordinates[1];
    var lng = item.geometry.coordinates[0];

    L.marker([lat, lng]).addTo(map)
        .bindPopup('<div class="card" style="width: 18rem;"><h4 class="card-header
        bg-primary">'+item.properties.name+'</h4><div class="card-body"><p
        class="card-text">地址: '+item.properties.address+'</p><p class="card-text">電話:
        '+item.properties.phone+'</p><h3 class="card-text text-danger">成人口罩: '+item.
        properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+'
        個</h3></div></div>');
    if(key == Math.round(listData.length/2)){
        panTo(lat, lng);
    }
});
```

10. 隨著list-group的hover事件觸發map popup

將name, address, phone, mask_adult, mask_child, lat, lng 7個參數以data-* 方式藏入list-group-item

```
listData.forEach(function(item, key){
    var strHTML = '<li class="list-group-item" data-name="'+item.properties.
        name+'" data-address="'+item.properties.address+'" data-phone="'+
        item.properties.phone+'" data-mask_adult="'+item.properties.
        mask_adult+'" data-mask_child="'+item.properties.mask_child+'"
        data-lat="'+item.geometry.coordinates[1]+' data-lng="'+item.
        geometry.coordinates[0]+'"><p class="h3 font-weight-bold">'+item.
        properties.name+'</p><p class="h4">地址: '+item.properties.address+'
        </p><p class="h4">電話: '+item.properties.phone+'</p><p>成人口罩: '+
        item.properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child
        +'個</p></li>';
    $("#region_list").append(strHTML);

    var lat = item.geometry.coordinates[1];
    var lng = item.geometry.coordinates[0];

    L.marker([lat, lng]).addTo(map)
        .bindPopup('<div class="card" style="width: 18rem;"><h4
        class="card-header bg-primary">'+item.properties.name+'
        </h4><div class="card-body"><p class="card-text">地址: '+item.
        properties.address+'</p><p class="card-text">電話: '+item.
        properties.phone+'</p><h3 class="card-text
        text-danger">成人口罩: '+item.properties.mask_adult+'個|兒童口罩:
        '+item.properties.mask_child+'個</h3></div></div>');
    if(key == Math.round(listData.length/2)){
        panTo(lat, lng);
    }
});
```

hover監聽觸發markerPopup(name, address, phone, mask_adult, mask_child, lat, lng)

```
//存儲過濾後單一鄉鎮區健保局開放資料儲存於listData
$("#AreaName").change(function(){
    selectTown = $(this).val();

    var listData = []; //存儲過濾後單一鄉鎮區健保局開放資料
    cityData.forEach(function(item){
    });

    //綁定所選取的鄉鎮區藥局資料於list-group
    $("#region_list").empty();
    removeMarker();
    listData.forEach(function(item, key){
```

```
//存儲過濾後單一鄉鎮區健保局開放資料儲存於listData
$("#AreaName").change(function(){
    selectTown = $(this).val();

    var listData = []; //存儲過濾後單一鄉鎮區健保局開放資料
    cityData.forEach(function(item){
    });

    //綁定所選取的鄉鎮區藥局資料於list-group
    $("#region_list").empty();
    removeMarker();
    listData.forEach(function(item, key){
    });

    //監聽list-group hover事件 marker popup
    $("#region_list .list-group-item").hover(function(){
        console.log("test");
        markerPopup($(this).data("name"), $(this).data("address"), $(this).data(
            "phone"), $(this).data("mask_adult"), $(this).data("mask_child"), $(
            this).data("lat"), $(this).data("lng"));
    })
});
```

定義markerPopup(name, address, phone, mask_adult, mask_child, lat, lng)

```
function markerPopup(name, address, phone, mask_adult, mask_child, lat, lng){
    L.marker([lat, lng]).addTo(map)
        .bindPopup('<div class="card" style="width: 18rem;"><h4
            class="card-header bg-primary">'+name+'</h4><div
            class="card-body"><p class="card-text">地址: '+address+'</p><p
            class="card-text">電話: '+phone+'</p><h3 class="card-text
            text-danger">成人口罩: '+mask_adult+'個|兒童口罩: '+mask_child+'
            個</h3></div></div>').openPopup();
}
```

11. 使用Leaflet.markercluster提升顯示效能

<https://github.com/Leaflet/Leaflet.markercluster#using-the-plugin>

載入檔案

```
<link rel="stylesheet" href="css/MarkerCluster.css">
<script src="js/leaflet.markercluster.js"></script>
```

宣告 markers 注意位置必須為產生地圖之後

```
var selectCity = ''; //存儲取得縣市名稱
var selectTown = ''; //存儲取得鄉鎮區名稱
var selectConuty = []; //存儲取得鄉鎮區
var cityData = []; //存儲健保局開放資料

//地圖
var map = L.map('map').setView([24.168515, 120.5997279], 15);

L.tileLayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png', {
    attribution: '&copy; <a href="https://www.openstreetmap.org/copyright">OpenStreetMap</a> contributors'
}).addTo(map);

var markers = new L.markerClusterGroup().addTo(map);
```

改寫marker產生方式


```

        mask_child+'個</p></li>';
    $("#region_list").append(strHTML);

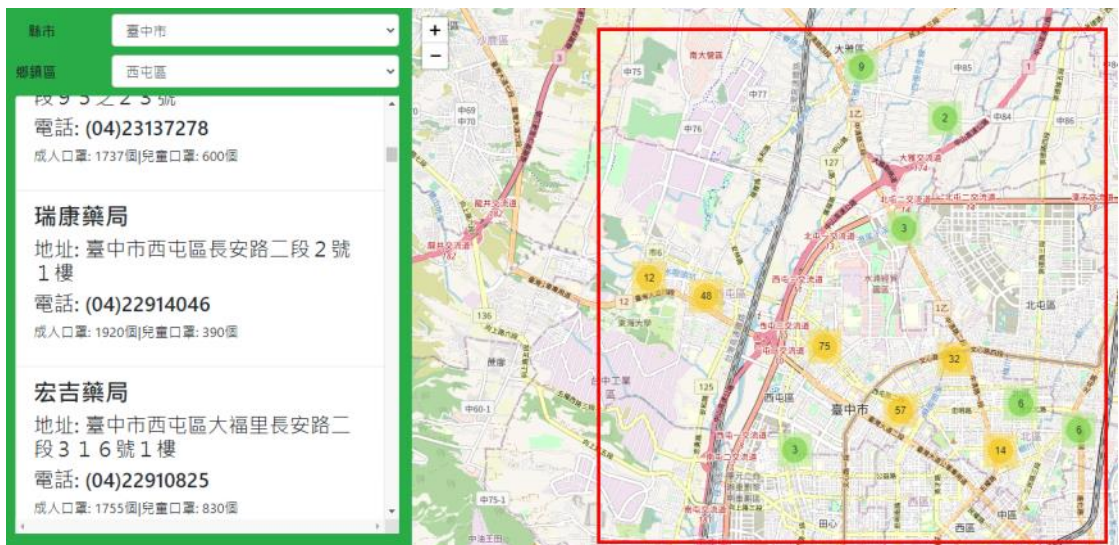
    var lat = item.geometry.coordinates[1];
    var lng = item.geometry.coordinates[0];

    var popupHTML = '<div class="card" style="width: 18rem;"><h4 class="card-header bg-primary">'+item.properties.name+'</h4><div class="card-body"><p class="card-text">地址: '+item.properties.address+'</p><p class="card-text">電話: '+item.properties.phone+'</p><h3 class="card-text text-danger">成人口罩: '+item.properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</h3></div></div>';
    markers.addLayer(L.marker([lat, lng]).bindPopup(popupHTML));

    // marker([lat, lng]).addTo(map)
    // .bindPopup('<div class="card" style="width: 18rem;"><h4 class="card-header bg-primary">'+item.properties.name+'</h4><div class="card-body"><p class="card-text">地址: '+item.properties.address+'</p><p class="card-text">電話: '+item.properties.phone+'</p><h3 class="card-text text-danger">成人口罩: '+item.properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+'個</h3></div></div>');

    if(key == Math.round(listData.length/2)){
        panTo(lat, lng);
    }
});

```



將hover 事件改成click 以方便使用

```

//監聽list-group hover事件 marker popup
$("#region_list .list-group-item").click(function(){
    console.log("test");
    markerPopup($(this).data("name"), $(this).data("address"), $(this).data("phone"), $(this).data("mask_adult"), $(this).data("mask_child"), $(this).data("lat"), $(this).data("lng"));
});

```

定義markercluster區塊字型與顏色，此處可自行定義！


```

/*設定小區塊 四方形*/
.marker-cluster-small {
    background-color: rgba(181, 226, 140, 0.6);
}
/*設定小區塊 圓形*/
.marker-cluster-small div {
    background-color: rgba(110, 204, 57, 0.6);
}

/*設定中區塊 四方形*/
.marker-cluster-medium {
    background-color: rgba(241, 211, 87, 0.6);
}
/*設定中區塊 圓形*/
.marker-cluster-medium div {
    background-color: rgba(240, 194, 12, 0.6);
}

/*設定大區塊 四方形*/
.marker-cluster-large {
    background-color: rgba(253, 156, 115, 0.6);
}
/*設定大區塊 圓形*/
.marker-cluster-large div {
    background-color: rgba(241, 128, 23, 0.6);
}

/*字型*/
.marker-cluster div {
    width: 30px;
    height: 30px;
    margin-left: 5px;
    margin-top: 5px;

    text-align: center;
    border-radius: 15px;
    font: 12px "Helvetica Neue", Arial, Helvetica, sans-serif;
}
.marker-cluster span {
    line-height: 30px;
}

```

12. 使用leaflet-color-markers改變marker顏色

<https://github.com/pointhi/leaflet-color-markers>

```

<!-- Option 2: jQuery, Popper.js, and Bootstrap JS-->
<script src="https://code.jquery.com/jquery-3.5.1.min.js"></script>
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js" integrity="
sha384-9/reFTGAW83EW2RDu2S0VKA1Zap3H66lZ48H5PoY1FhbgU+68Zp6G7niu735Sk71N" crossorigin="anonymous"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.5.3/dist/js/bootstrap.min.js" integrity="
sha384-w1Q4orYjBQndcko6MimVbzY0tgp4pWB41Z7lr30WKz0vr/awKhXdBNmNb5D92v7s" crossorigin="anonymous"></script>
<script src="js/CityCountyData.json"></script>
<link rel="stylesheet" href="https://unpkg.com/leaflet@1.7.1/dist/leaflet.css" />
<script src="https://unpkg.com/leaflet@1.7.1/dist/leaflet.js"></script>
<link rel="stylesheet" href="css/MarkerCluster.css">
<script src="js/leaflet.markercluster.js"></script>
<script src="js/leaflet-color-markers.js"></script>

```

更改icon顏色

```

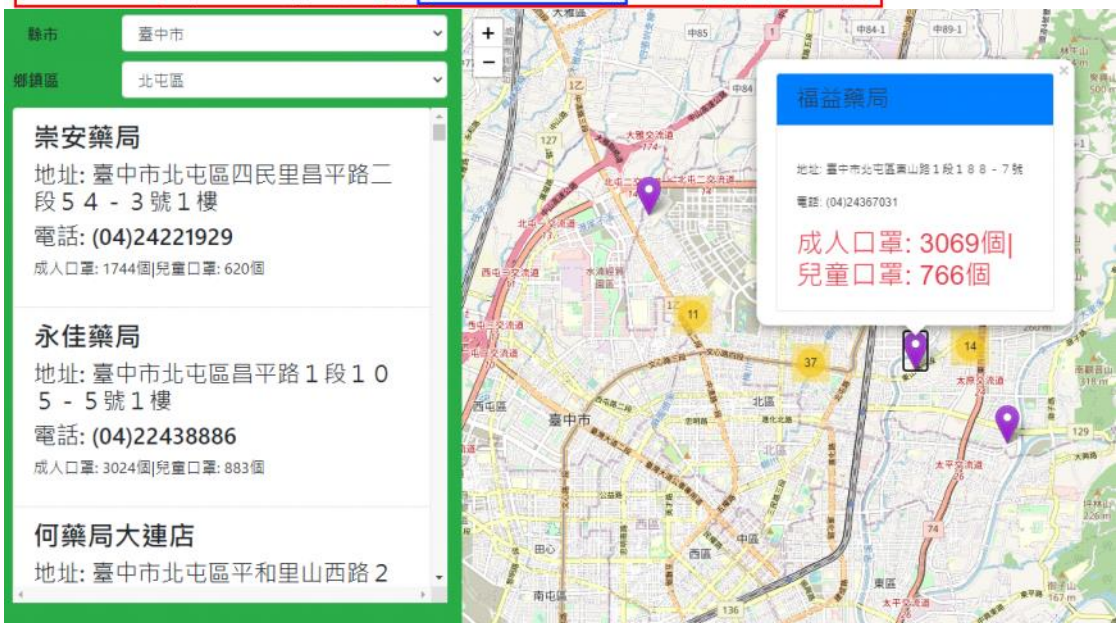
var popupHTML = '<div class="card" style="width: 18rem;"><h4 class="card-header bg-primary">'+item.
properties.name+'</h4><div class="card-body"><p class="card-text">地址: '+item.properties.address+
'</p><p class="card-text">電話: '+item.properties.phone+'</p><h3 class="card-text
text-danger">成人口罩: '+item.properties.mask_adult+'個|兒童口罩: '+item.properties.mask_child+
'個</h3></div></div>';

```

```

markers.addLayer(L.marker([lat, lng], {icon: violetIcon}).bindPopup(popupHTML));

```



13. 取得使用者位置

經緯度取得程式碼參考 https://www.w3schools.com/html/html5_geolocation.asp

取得經緯度後以panTo()轉移地圖位置並以marker顯示!

```

var selectCity = ''; //存儲取得縣市名稱
var selectTown = ''; //存儲取得鄉鎮區名稱
var selectConuty = []; //存儲取得鄉鎮區
var cityData = []; //存儲健保局開放資料
var curLat, curLng; //使用者位置

//取得使用者位置
if (navigator.geolocation) {
    navigator.geolocation.getCurrentPosition(showPosition);
} else {
    console.log("Geolocation is not supported by this browser.");
}

function showPosition(position) {
    curLat = position.coords.latitude;
    curLng = position.coords.longitude;
    panTo(curLat, curLng);
    L.marker([curLat, curLng], {icon: blackIcon})
    .addTo(map).bindPopup("<h1>我的位置!!</h1>").openPopup(); //標出目前的位置(黑色座標)
    console.log("Lat: "+curLat+" Lng: "+curLng);
}

```

