Google Map

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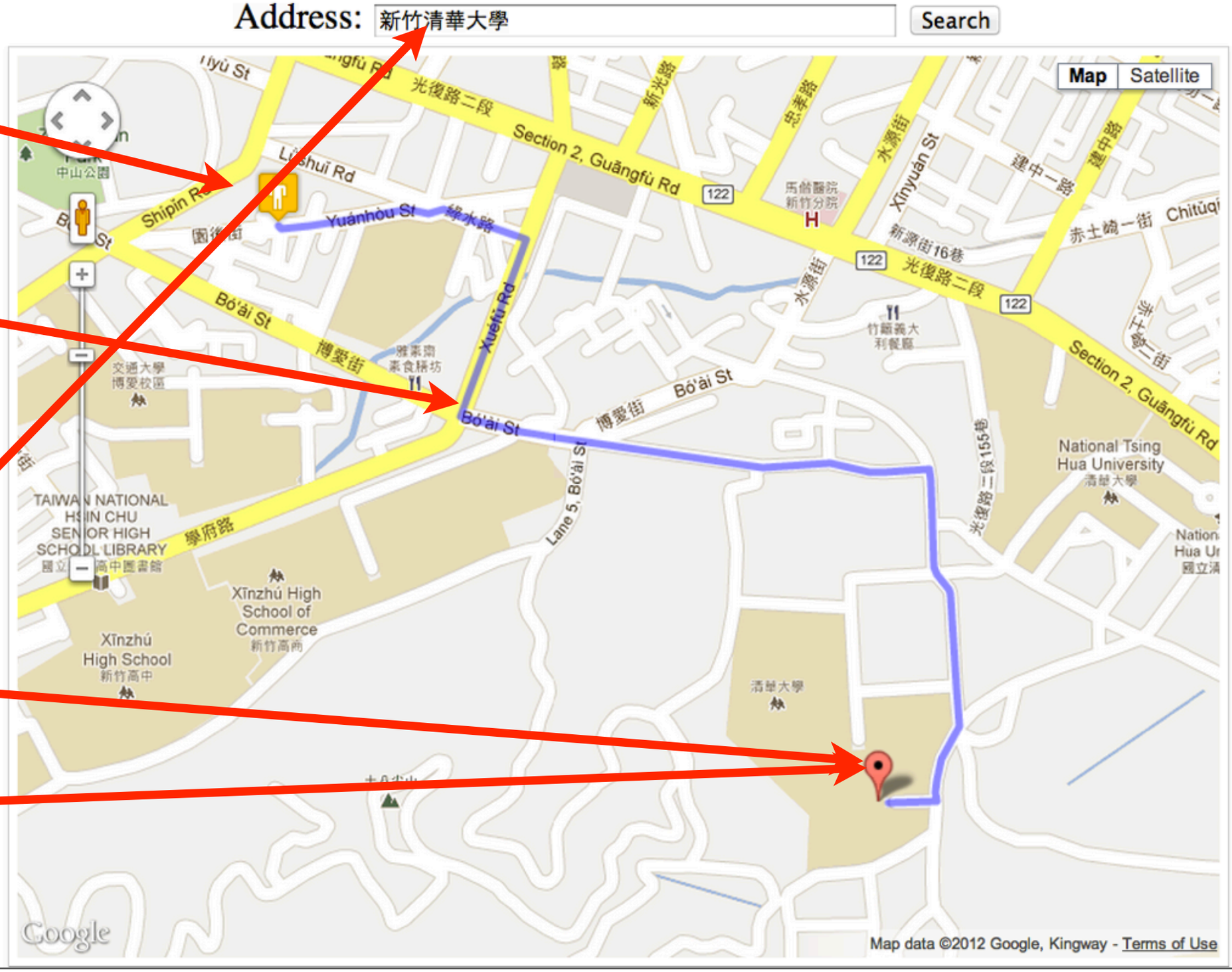
Outline

- Google Map
  - Closure
  - Functional programming
  - Assignment
  - Related applications demo
- Javascript Encoder & Packer

Google Map v3

- Client Location
- Direction
- GeoCoder
- Marker
- Event



Getting Started

CSS(Optional)

```
html, body, #map_canvas {
  margin: 0;
  padding: 0;
  height: 100%;
}
```

include external javascript

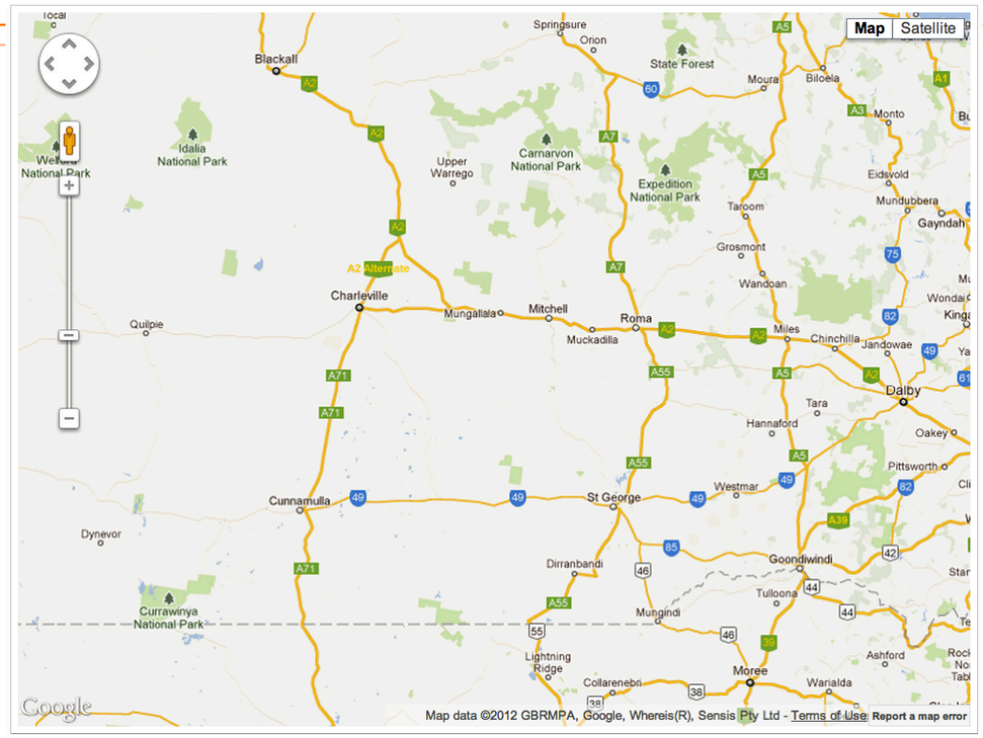
```
<script type="text/javascript"
    src="http://maps.googleapis.com/maps/api/js?sensor=false"></script>
```

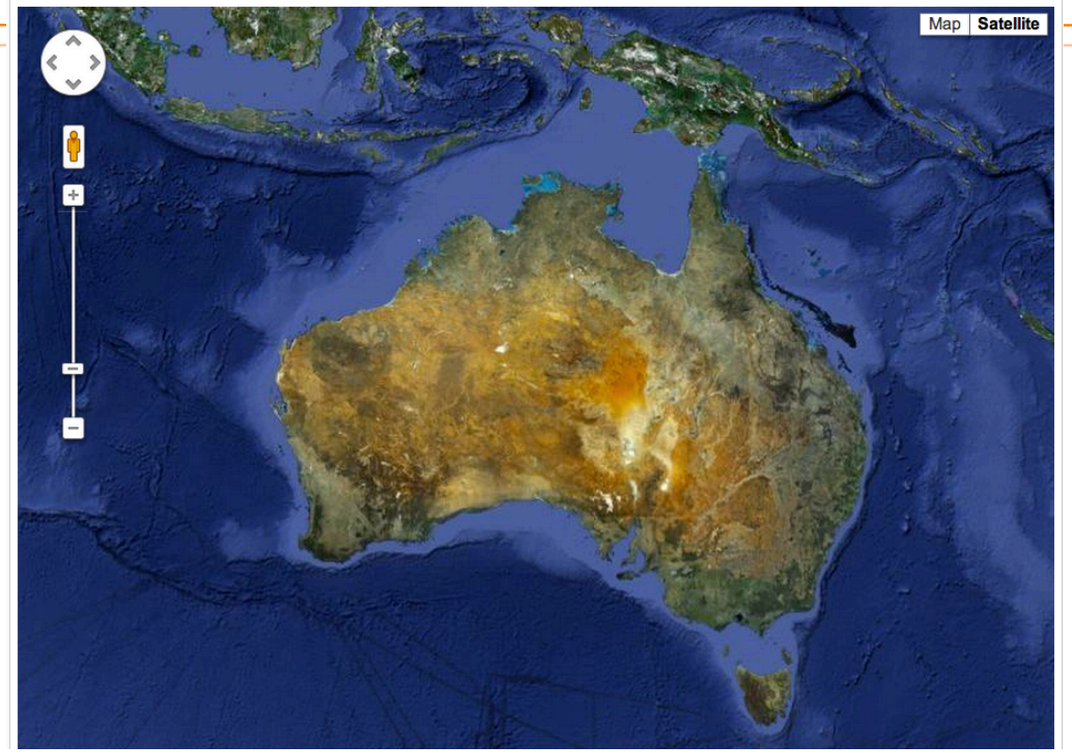
```
function initialize() {
  var myOptions = {
    center: new google.maps.LatLng(-34.397, 150.644),
    zoom: 8,
    mapTypeId: google.maps.MapTypeId.ROADMAP
  };
  var map = new google.maps.Map(document.getElementById("map_canvas"),
      myOptions);
```

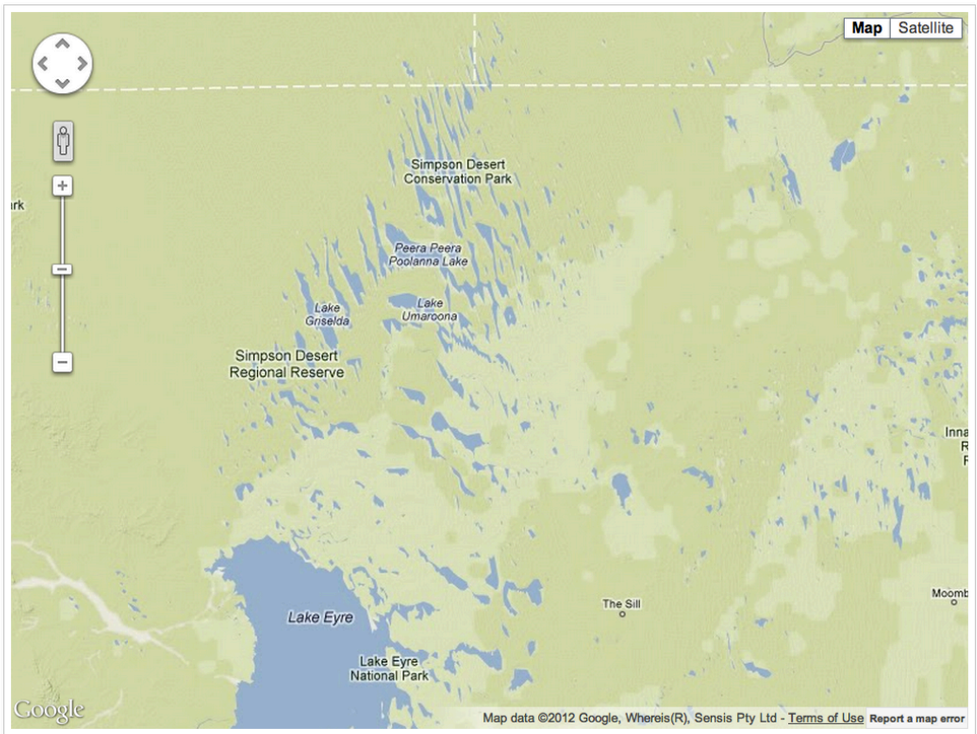
google.maps.LatLng

- latLng = new **google.maps**.LatLng(latitude, longitude); // initialization
- Some methods
  - equals(other:LatLng) // comparison function
  - lat()
  - lng()
  - toString(): "(-34.397, 150.644)"
  - toUrlValue(precision?:number): "-34.397,150.644"
- Demo: http://goo.gl/iE7YY

MapType


Map
Satellite
Springsure
Orion
Blackall
State Forest
Moura
Biloela
Monto
Idalia National Park
Upper Warrego
Carnarvon National Park
Expedition National Park
Eidsvold
Mundubbera
Gayndah
Taroom
Grosmont
Wandoan
A2 Alternate
Charleville
Mungallala
Mitchell
Roma
Quilpie
Muckadilla
Miles
Chinchilla
Jandowae
Dalby
Tara
Hannaford
Oakey
Pittsworth
Westmar
Cunnamulla
St George
Dynevor
Dirranbandi
Goondiwindi
Tulloona
Currawinya National Park
Mungindi
Lightning Ridge
Collarenebri
Moree
Ashford
Warialda
Google
Map data ©2012 GBRMPA, Google, Whereis(R), Sensis Pty Ltd - Terms of Use Report a map error


Map
Satellite


Map
Satellite
Simpson Desert Conservation Park
Peera Peera Poolanna Lake
Lake Griselda
Lake Umaroona
Simpson Desert Regional Reserve
The Sill
Lake Eyre
Lake Eyre National Park
Google
Map data ©2012 Google, Whereis(R), Sensis Pty Ltd - Terms of Use Report a map error


Map
Satellite
A2 Alternate
Charleville
A71
Warrego Hwy
Mitchell Hwy
Google

Client Location

- Add another external javascript library or use another sample from “Code Samples”
  - src="http://www.google.com/jsapi"
- Get client location from google.loader and center map to there.

```
client = new google.maps.LatLng(google.loader.ClientLocation.latitude, google.loader.ClientLocation.
  longitude);
map.panTo(client);
map.setZoom(15);
```

- Demo: http://goo.gl/NIVU

google.maps.Marker

```
var userMarker = new google.maps.Marker({
  map: map,
  position: client,
  icon: "images/male.png"
});
```

MarkerOptions wrapped by braces {}

- Some properties
  - animation
  - icon
  - map
  - position
  - title
  - zIndex
- Demo: http://goo.gl/3PRpO

Event

```
google.maps.event.addListener(map, 'click', function(e) {
  userMarker.setPosition(e.latLng); // by closure
});
```

- Concept:
  - Closure
  - Functional Programming
- Sample: place a marker on client location
  - http://mirlab.org/users/ronald.hsu/web_course_demo/clientMarker.html

JS Advanced Concept

- Closure
  - Wikipedia: In computer science, a closure (also lexical closure or function closure) is a function together with a referencing environment for the non-local variables of that function. [1] A closure allows a function to access variables outside its immediate lexical scope.
  - More: http://caterpillar.onlyfun.net/Gossip/JavaScript/Closure.html
- Functional Programming
  - Extended Reading: http://www.slideshare.net/ihower/fp-osdc2012v2

Closure & Functional Programming

```
var x = 1;
function say() { alert(x); }
x = 3;
say();
```

```
function makeFunc(c) {
    var x = c;
    return function() { alert(x); }
}
x = 3;
var say1 = makeFunc(1);
say1();
var say2 = makeFunc(2);
say2();
```

- http://jsfiddle.net、http://jsbin.com/

Closure & Functional Programming

```
var x = 1;
function say() { alert(x); }
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Call by reference

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- http://jsfiddle.net 、 http://jsbin.com/

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```

Closure

Functional Programming & Anonymous Function

- http://jsfiddle.net 、 http://jsbin.com/

Functional Programming(Cont.)

```
function pyth(x,y) {
    return sqrt(x*x+y*y);
}
function sqrt(x) {
    return x*x;
}

function alertFunc(f) {
    alert(f);
}
alertFunc(pyth(2,3));
```

```
function multiplier(x, y){
    return x*y;
}

alert(multiplier(2, 3));
m = multiplier;
alert(m(2, 3));
```

Functional Programming(Cont.)

```
function pyth(x,y) {
    return sqrt(x*x+y*y);
}
function sqrt(x) {
    return x*x;
}

function alertFunc(f) {
    alert(f);
}
alertFunc(pyth(2,3));
```

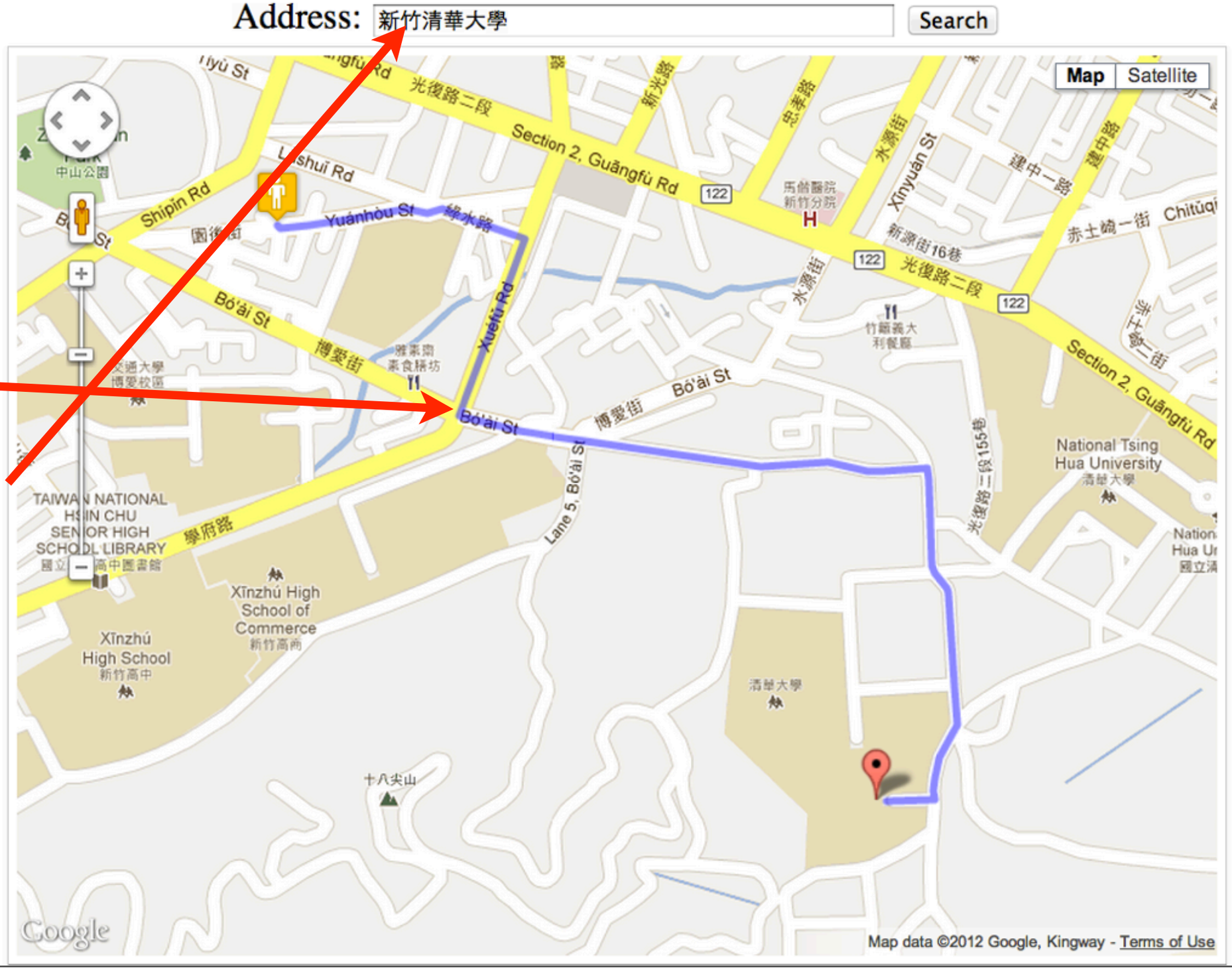
```
function multiplier(x, y){
    return x*y;
}

alert(multiplier(2, 3));
m = multiplier;
alert(m(2, 3));
```

Call by function

Rename this function

Google Map v3(Cont.)

- Directions
- GeoCoder



DOMListener & GeoCoder

- My version:

```
/* === for searching address feature by closure === */
var geocoder = new google.maps.Geocoder();
var address_field = document.getElementById("address_txt");
google.maps.event.addDomListener(document.getElementById("search_btn"), 'click', function(){
  var address = address_field.value;

  if (geocoder) {
    geocoder.geocode({'address':address, 'language':'tw'}, function(results, status){
    if (status == google.maps.GeocoderStatus.OK) {
      map.panTo(results[0].geometry.location);
      //placeMarker(results[0].geometry.location, results[0].address_components[0].long_name,
      ].formatted_address, 0);
    } else {
      alert("Geocode was not successful for the following reason: " + status);
    }
    });
  }
});
```

- Demo: http://goo.gl/v8AtJ

Direction / Route

```
function calcRoute(start, end) {
  /*var start = document.getElementById("start").value;
  var end = document.getElementById("end").value;*/
  var request = {
    origin:start,
    destination:end,
    travelMode: google.maps.TravelMode.DRIVING
  };
  directionsService.route(request, function(result, status) {
    if (status == google.maps.DirectionsStatus.OK) {
      directionsDisplay.setDirections(result);
    }
  });
}
```

BICYCLING, WALKING

For showing (or polyline)

- Demo: http://goo.gl/zfvkk

MarkerCluster

```
var markers = [];   // for marker cluster

for (var index in ipeen_hsinchu)
{
  var shop = ipeen_hsinchu[index];
  /*alert(shop["lat"] + ", " + shop["lng"]);
  break;*/
  var marker = placeShopRoute(userMarker, shop, map);
  markers.push(marker);
}

/* setting marker cluster */
markerClusterer = new MarkerClusterer(map, markers);
```

- Demo: http://goo.gl/8iWs

Reference Usage (Other parts of GMap)

- https://developers.google.com/maps/
- Developer's Guide
  - Services
  - Libraries
- API Reference
- Code Samples & More Resources(Advanced)
- Another alternative: an open source project "OpenStreetMap"

Dictionary / Hash Table

1

```
var ipeen_hsinchu = {};
ipeen_hsinchu[0] = {};
ipeen_hsinchu[0]["name"] = "均鎂糕餅公司";
ipeen_hsinchu[0]["address"] = "新竹縣竹北市文平路302號";
```

2

```
var a = {};
a[0] = {"name": "test",
"number": 3};
alert(a[0].number);
```

Demo

- Sample
- Customize Google Map Layer
  - https://github.com/hothero/Customize-Google-Map-Layer
- Spotmap
  - http://hothero.org/SpotMap/map.html
- Anyweather
  - http://anyweather.hothero.org/

Javascript encoder & packer

- http://dean.edwards.name/packer/ 、 http://javascriptcompressor.com/
  - Practically
- http://utf-8.jp/public/aaencode.html
  - For fun
- More: http://goo.gl/fvDBl
- Keyword: Obfuscator, obfuscation, compiler, encoder, ... etc.

Thanks for your listening

- Q & A