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# Advanced Web Programming with **JavaScript and Google Maps**

**Voronezh State University**

**Voronezh (Russia)**

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# Google Maps

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## Introduction

- Google Maps (GM) API is a geospatial viewing tool
  - GM API allows the programmer to embed GM in web pages with JavaScript
- GM API is used by millions of web sites to provide geolocalized information
- GM API is currently a free product and requires no installation or management

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## Introduction

- Google reserves the right to put advertising on the map at any point in the future:

***Advertising***. *The Service currently does not include advertising in the maps images. However,* ***Google reserves the right to include advertising in the maps images provided to you through the Service, but will provide you with ninety (90) days notice prior to the commencement of advertising in the maps images***. *Such notice may be provided on relevant Google websites, including but not limited to the Google Geo Developers Blog and the Google Maps API Group (or such successor URLs that Google may designate from time to time). During that 90 day period, you may terminate your use of the Service, or provide notice of your refusal to accept advertising in the maps images in accordance with Google's policies and procedures for providing such notice (which Google may make available from time to time in its sole discretion).*

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## Introduction

- GM API provides a number of utilities for manipulating maps and adding content to the map
- Success reason:
  - The ability to customize the map display through the addition of application specific data is the true driver of its acceptance

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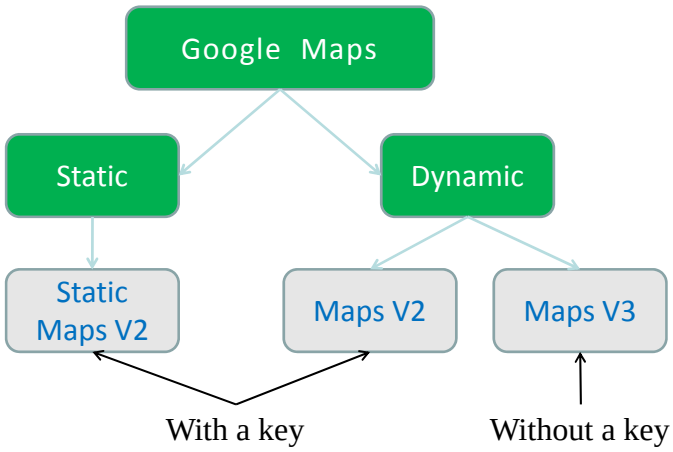


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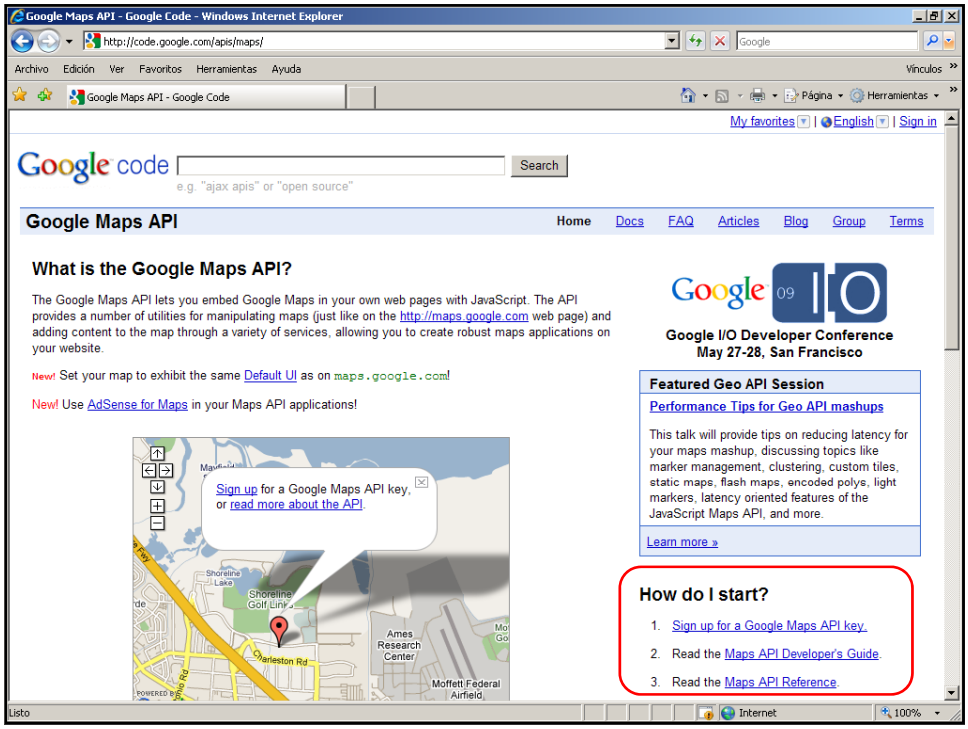
## Introduction

- Sign up for an API key
  - Sign up for a **Google Account**
  - Specify a web site **URL** → A single API key is valid for a single directory or domain


Google Maps API - Google Code - Windows Internet Explorer
http://code.google.com/apis/maps/
Google Maps API - Google Code
My favorites | English | Sign in
Google code
Search
e.g. "ajax apis" or "open source"
Google Maps API
Home Docs FAQ Articles Blog Group Terms
What is the Google Maps API?
The Google Maps API lets you embed Google Maps in your own web pages with JavaScript. The API provides a number of utilities for manipulating maps (just like on the http://maps.google.com web page) and adding content to the map through a variety of services, allowing you to create robust maps applications on your website.
New! Set your map to exhibit the same Default UI as on maps.google.com!
New! Use AdSense for Maps in your Maps API applications!
Sign up for a Google Maps API key, or read more about the API.
Google I/O Developer Conference
May 27-28, San Francisco
Featured Geo API Session
Performance Tips for Geo API mashups
This talk will provide tips on reducing latency for your maps mashup, discussing topics like marker management, clustering, custom tiles, static maps, flash maps, encoded polys, light markers, latency oriented features of the JavaScript Maps API, and more.
Learn more »
How do I start?
1. Sign up for a Google Maps API key.
2. Read the Maps API Developer's Guide.
3. Read the Maps API Reference.
Listo
Internet
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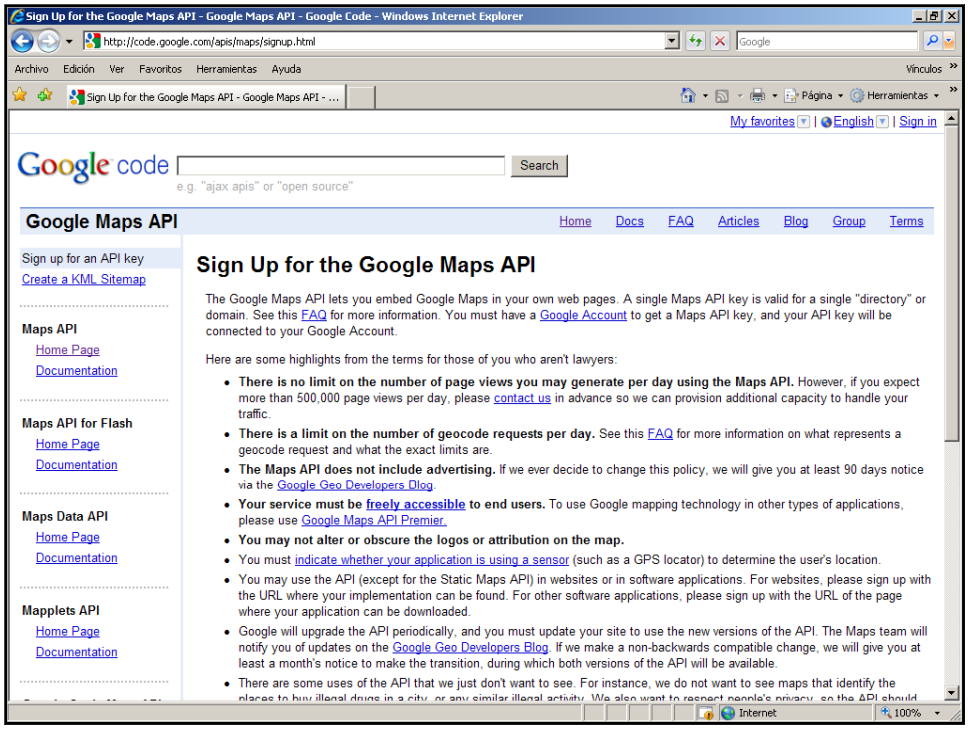
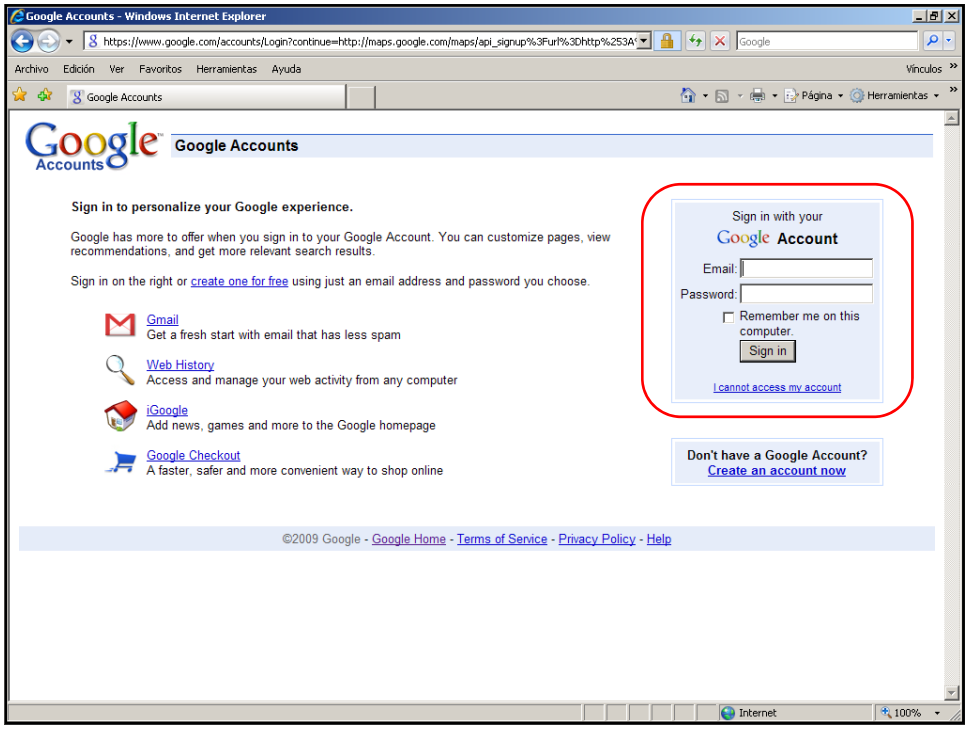

Sign Up for the Google Maps API - Google Maps API - Google Code - Windows Internet Explorer
http://code.google.com/apis/maps/signup.html
Sign Up for the Google Maps API - Google Maps API - ...
My favorites | English | Sign in
Google code
Search
e.g. "ajax apis" or "open source"
Google Maps API
Home Docs FAQ Articles Blog Group Terms
Sign up for an API key
Create a KML Sitemap
Maps API
Home Page
Documentation
Maps API for Flash
Home Page
Documentation
Maps Data API
Home Page
Documentation
Mapplets API
Home Page
Documentation
Sign Up for the Google Maps API
The Google Maps API lets you embed Google Maps in your own web pages. A single Maps API key is valid for a single "directory" or domain. See this FAQ for more information. You must have a Google Account to get a Maps API key, and your API key will be connected to your Google Account.
Here are some highlights from the terms for those of you who aren't lawyers:
There is no limit on the number of page views you may generate per day using the Maps API. However, if you expect more than 500,000 page views per day, please contact us in advance so we can provision additional capacity to handle your traffic.
There is a limit on the number of geocode requests per day. See this FAQ for more information on what represents a geocode request and what the exact limits are.
The Maps API does not include advertising. If we ever decide to change this policy, we will give you at least 90 days notice via the Google Geo Developers Blog.
Your service must be freely accessible to end users. To use Google mapping technology in other types of applications, please use Google Maps API Premier.
You may not alter or obscure the logos or attribution on the map.
You must indicate whether your application is using a sensor (such as a GPS locator) to determine the user's location.
You may use the API (except for the Static Maps API) in websites or in software applications. For websites, please sign up with the URL where your implementation can be found. For other software applications, please sign up with the URL of the page where your application can be downloaded.
Google will upgrade the API periodically, and you must update your site to use the new versions of the API. The Maps team will notify you of updates on the Google Geo Developers Blog. If we make a non-backwards compatible change, we will give you at least a month's notice to make the transition, during which both versions of the API will be available.
There are some uses of the API that we just don't want to see. For instance, we do not want to see maps that identify the
Internet
100%


Google Accounts - Windows Internet Explorer
Google Accounts
Sign in to personalize your Google experience.
Google has more to offer when you sign in to your Google Account. You can customize pages, view recommendations, and get more relevant search results.
Sign in on the right or create one for free using just an email address and password you choose.
Gmail
Get a fresh start with email that has less spam
Web History
Access and manage your web activity from any computer
iGoogle
Add news, games and more to the Google homepage
Google Checkout
A faster, safer and more convenient way to shop online
Sign in with your Google Account
Email:
Password:
Remember me on this computer.
Sign in
I cannot access my account
Don't have a Google Account?
Create an account now
©2009 Google - Google Home - Terms of Service - Privacy Policy - Help


Google Maps API - API Key Signup - Windows Internet Explorer
slujanmora@gmail.com | My Account | Sign out
Search
e.g. "ajax apis" or "open source"
Google Maps API
Home Docs FAQ Articles Blog Group Terms
Sign up for an API key
Create a KML Sitemap
Maps API
Home Page
Documentation
Maps API for Flash
Home Page
Documentation
Mapplets API
Home Page
Documentation
Google Static Maps API
Developer's Guide
Google Maps API Premier
Google Maps API - API Key Signup
Thank You for Signing Up for a Google Maps API Key!
Your key is:
This key is good for all URLs consisting of this registered domain (and directory if applicable):
http://localhost/
Note: for more information on the API key system, consult http://code.google.com/apis/maps/faq.html#keysystem.
How you use your key depends on what Maps API product or service you use. Your key is valid for use within the entire family of Google Maps API solutions. The following examples show how to use your key within the Maps API product family.
JavaScript Maps API Example
Within the JavaScript Maps API, place the key within the script tag when you load the API:
// Note: you will need to replace the sensor parameter below with either an explicit true or false value.
<script src="http://maps.google.com/maps?

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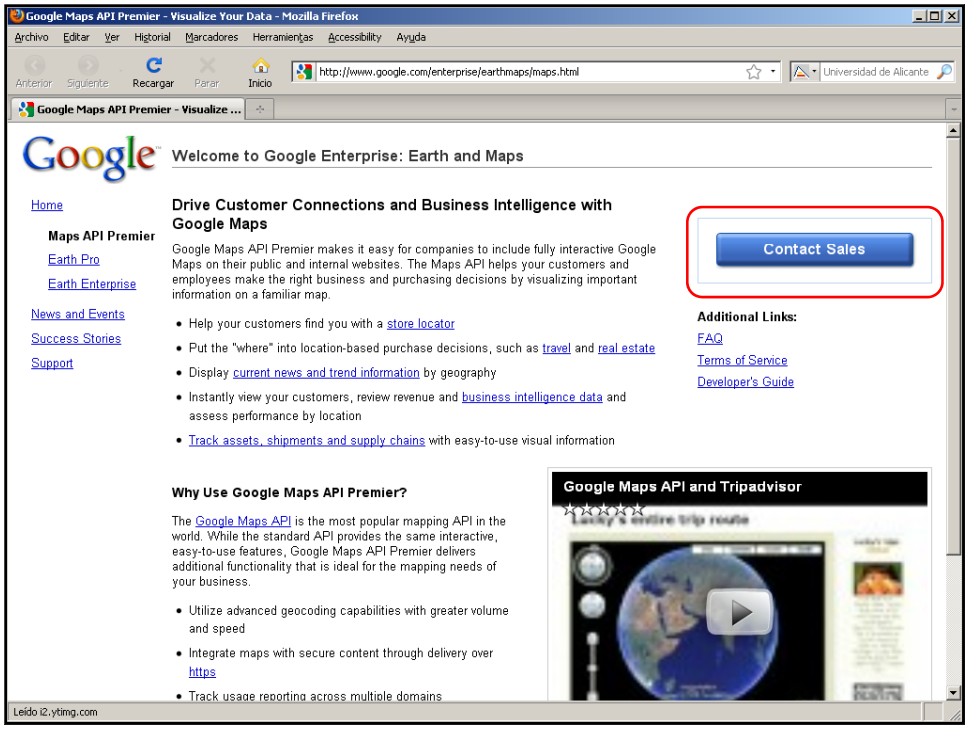
# Introduction

- **Important!**: the web page where Google Maps is used must be freely accessible to end users
  - If the intention is to use in a commercial service, **Google Maps API Premier** must be used



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## Static Maps

- It provides static maps: the user can't manipulate (move, zoom, …) the map
  - It doesn't require JavaScript
  - The map is created based on query string parameters in the URL
  - The map is sent back to the web browser as an image (GIF, PNG or JPEG)
  - It is useful for light web sites or for mobile devices (PDAs, cell phones, …)

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## Static Maps

- In a request, the following information can be defined:
  - The location of the map
  - The size of the map
  - The zoom level
  - The type of map
  - The location of markers with labels

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## Static Maps

- Request:

  http://maps.google.com/maps/api/staticmap?*parameters*

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## Static Maps

- Location parameters:
  - `center`
  - `zoom`
- Configuration parameters:
  - `size`
  - `format`
  - `maptype`
  - `mobile`
  - `language`

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## Static Maps

- Features parameters:
  - `markers`
  - `path`
  - `visible`
- General parameters:
  - `key`
  - `sensor`

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## Static Maps

- Location (`center`):
  - Latitudes and longitudes are defined using numerals within a comma-separated text string that have a precision to 6 decimal places
  - Precision beyond the 6 decimal places is ignored
  - Latitudes can take any value between -90 and 90 while longitude values can take any value between -180 and 180

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## Static Maps

- Zoom level (`zoom`):
  - 0 to 21
- Map type (`maptype`):
  - `roadmap` (default value)
  - `satellite`
  - `terrain`
  - `hybrid`

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## Static Maps

- **EXAMPLE**
- Map centered in Voronezh
  - Latitude: 51.68
  - Longitude: 39.22
- Zoom level: 14
- Size: 600x400
- Type: road map

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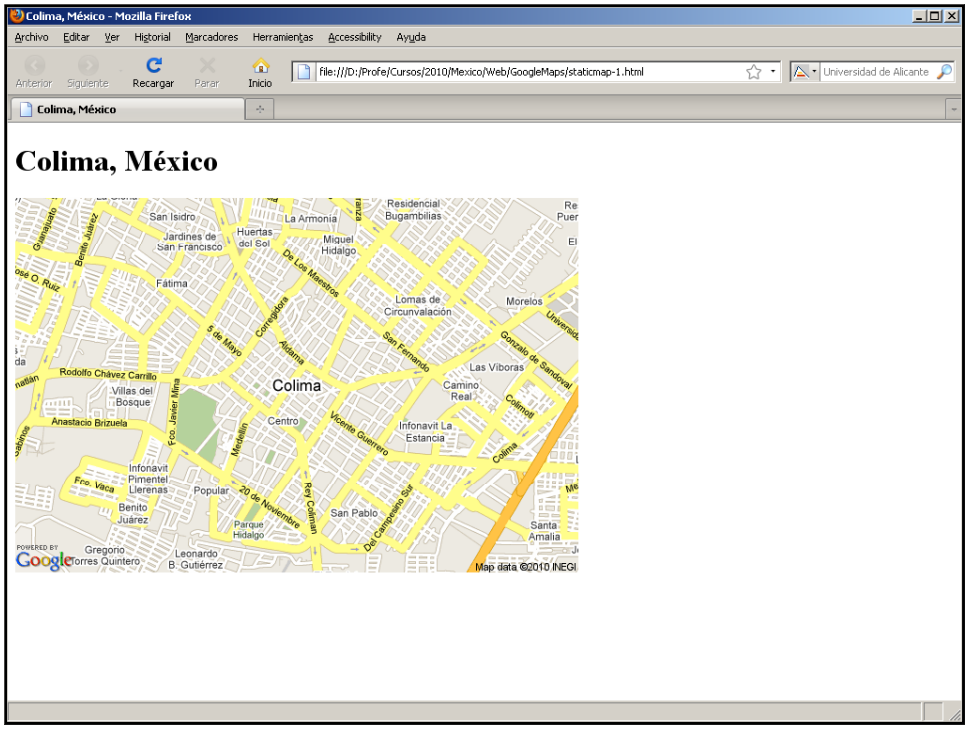
# Static Maps

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="es"
   lang="es">
<head><title>Voronezh, Russia</title></head>
<body>
<h1>Voronezh, Russia</h1>
<img
   src="http://maps.google.com/maps/api/staticmap?center=
   51.68,39.22&zoom=14&size=600x400&maptype=roadmap&sensor
   =false&key=API_KEY"
 width="600" height="400" alt="Map of Voronezh" />
</body>
</html>
```



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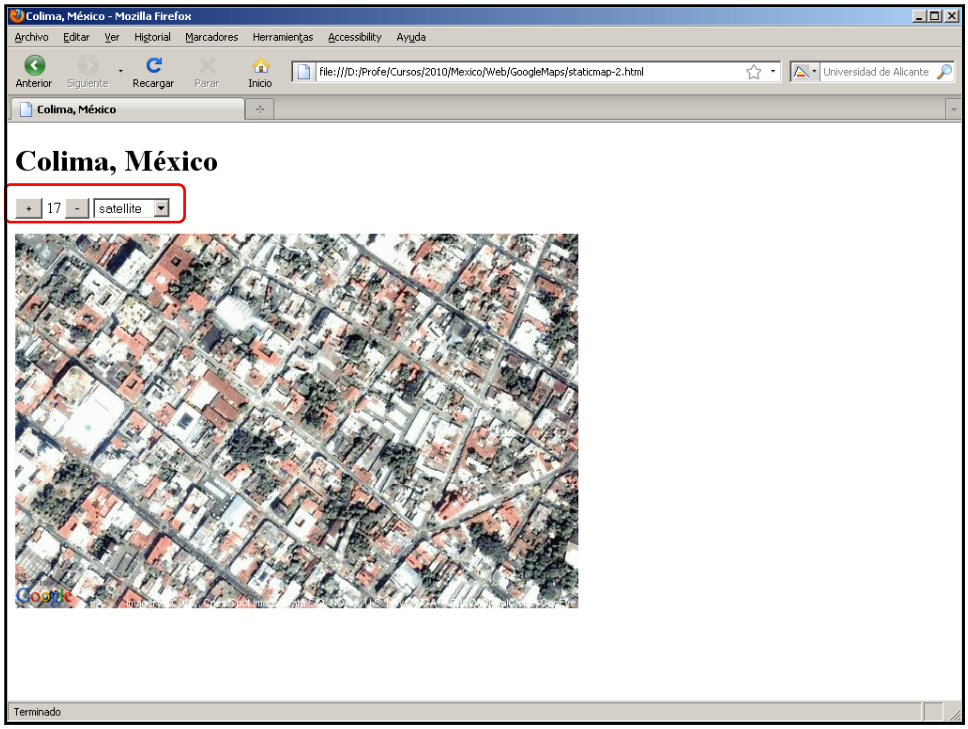
# Static Maps

- **EXERCISE**
- Modify the previous map:
  - Add two buttons ("+" y "-") to change the zoom level
  - Add a text label that shows the current zoom level
  - Add a list that allows the user to change the map type



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## Static Maps

- Markers
  - All the markers defined in the same `markers` parameter share the same visual style

    `markers=`*`markerStyles`*`|`*`markerLocation1`*`|`*`markerLocation2`*`|...`
  - If different visual styles are needed, different `markers` parameters must be used

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## Static Maps

- The set of marker style descriptors is a series of value assignments separated by the pipe (|) character
- Marker style descriptors:
  - `size` (`tiny`, `mid`, `small`)
  - `color`: 24-bit color (0xFF0000) or a predefined color (black, brown, green, purple, yellow, blue, gray, orange, red, white)
  - `label` (a single uppercase alphanumeric character [A-Z0-9])
    - `tiny` and `small` markers are not capable of displaying an alphanumeric-character

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# Static Maps

- **EXAMPLE**
- Define three markers:
  - Markers 1 y 2:
    - Size: mid
    - Color: red
    - Label: A
    - Locations: (19, -103) and (18.5, -103.5)
  - Marker 3:
    - Size: tiny
    - Color: blue
    - Location: (19.5, -102.5)

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# Static Maps

```
markers=size:mid|color:red|label:A|19,-103|
18.5,-103.5
&markers=size:tiny|color:blue|19.5,-102.5
```

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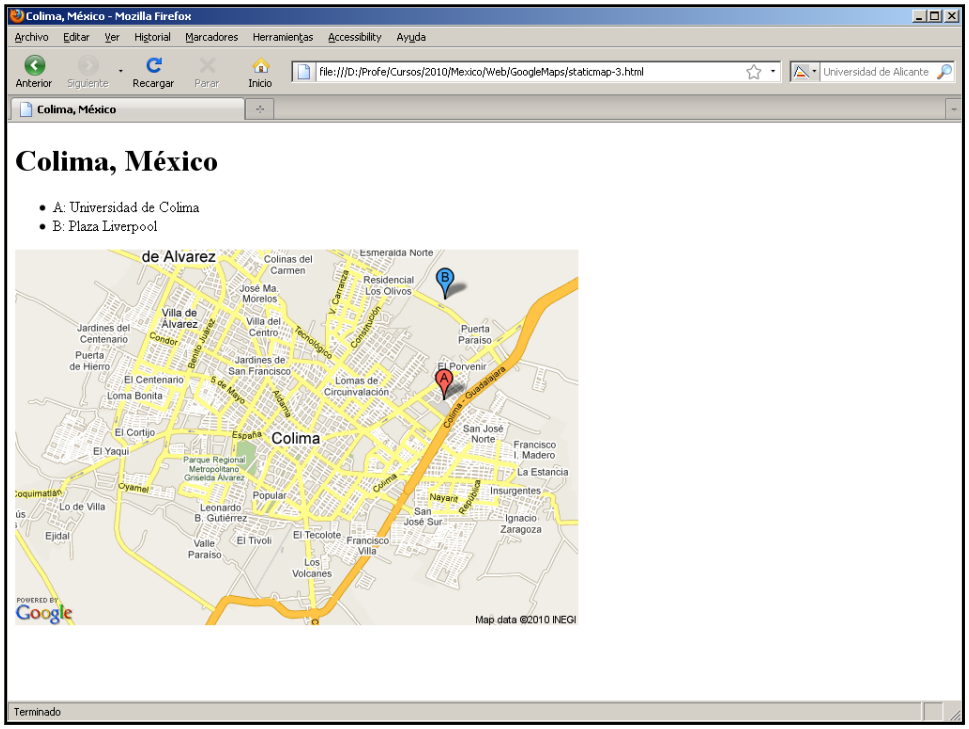
# Static Maps

- **EXERCISE**
- Map centered in Voronezh
- Zoom level: 14
- Size: 600x400
- Type: road map
- Show two markers:
  - A blue marker, with label "U", on Voronezh State University
  - A red marker, with label "L", on Lenin Square



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## Static Maps

- **SOLUTION**

```
<img src="http://maps.google.com/maps/api/staticmap
?center=19.243311,-103.724753
&zoom=13
&size=600x400
&maptype=roadmap
&markers=color:blue|label:U|19.249778,-103.697788
&markers=color:red|label:L|19.267065,-103.697705
&sensor=false&key=API_KEY"
 width="600" height="400" alt="Map of Voronezh" />
```



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## Static Maps

- There can be also:
  - Paths

```
path=color:0xff0000ff|weight:5|40.737102
  ,-73.990318|40.749825,-
  73.987963|40.752946,-
  73.987384|40.755823,-73.986397
```

  - Polygons

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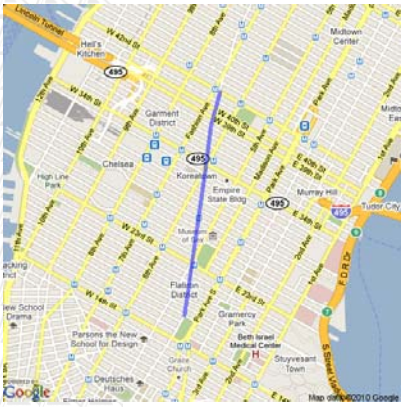





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# Documentation

- Google Maps API V2 Developer Guide:
  - http://code.google.com/apis/maps/documentation/staticmaps/
- Google Maps API Concepts:
  - http://code.google.com/apis/maps/documentation/
- Google Maps API Examples:
  - http://code.google.com/apis/maps/documentation/examples/
- Google Maps API Reference:
  - http://code.google.com/apis/maps/documentation/reference.html

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**Core Class:**

GMap2

This is the most important class within the Maps API. The other classes in this reference are grouped by their purpose.

**Base Classes:**

GBounds
GBrowserIsCompatible
GDraggableObject
GDraggableObjectOptions
GInfoWindow
GInfoWindowOptions
GInfoWindowTab
GKeyboardHandler
GLanguage
GLatLng
GLatLngBounds
GLog
GMapOptions
GMapPane
GPoint
GSize
GUnload
G_API_VERSION

**Event Classes:**

GEvent
GEventListener

**Control Classes:**

GControl
GControlAnchor
GControl
GControlPosition
GHierarchicalMapTypeControl
GMapType
GMapTypeControl
GMapTypeOptions
GMapUIOptions
GMenuMapTypeControl
GNavLabelControl

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**Overlay Classes:**

GCopyright
GCopyrightCollection
GGroundOverlay
GIcon
GLayer
GMarker
GMarkerManager
GMarkerManagerOptions
GMarkerOptions
GMercatorProjection
GOverlay
GPolyEditingOptions
GPolyStyleOptions
GPolygon
GPolygonOptions
GPolyline
GPolylineOptions
GProjection
GScreenOverlay
GScreenPoint
GScreenSize
GTileLayer
GTileLayerOptions
GTileLayerOverlay
GTileLayerOverlayOptions

**Service Classes:**

GAdsManager
GAdsManagerOptions
GAdsManagerStyle
GClientGeocoder
GDirections
GDirectionsOptions
GDownloadUrl
GFactualGeocodeCache
GGeoAddressAccuracy
GGeoStatusCode
GGeoXml
GGeocodeCache
GGoogleBar
GGoogleBarAdsOptions
GGoogleBarLinkTarget
GGoogleBarListingTypes
GGoogleBarOptions
GGoogleBarResultList
GPov
GRoute
GStep
GStreetviewClient
GStreetviewClient.ReturnValues
GStreetviewData
GStreetviewLink
GStreetviewLocation
GStreetviewOverlay
GStreetviewPanorama
GStreetviewPanorama.ErrorValues
GStreetviewPanoramaOptions
GTrafficOverlay
GTrafficOverlayOptions
GTravelModes
GXml
GXmlHttp
GXslt

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## Simple Map

```
<script
   src="http://maps.google.com/maps?file=api&am
   p;v=2&amp;sensor=false&amp;key=API_KEY"
   type="text/javascript"></script>
```

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## Simple Map

- **EXAMPLE**
- Map centered in Voronezh
- Zoom level: 14
- Size: 600x400
- With and without user's interface

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# Simple Map

```
<script type="text/javascript">
function initialize() {
  if (GBrowserIsCompatible()) {
    var map = new
   GMap2(document.getElementById("map_canvas"));
    // Alicante (Spain)
    // map.setCenter(new GLatLng(37.4419, -122.1419), 13);
    // Voronezh (Russia)
    map.setCenter(new GLatLng(51.24, 22.57), 13);
    // Show user interface
    // map.setUIToDefault();
  }
}
</script>
```

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# Simple Map

- `var map = new GMap2()` → We pass the `<div>` specifying where the map will appear
  - The size of the map will default to the size specified in the `<div>` tag
- `map.setCenter()` → We center the map at a particular latitude, longitude, and zoom level
  - This method must be called first after construction to set the initial state of the map
  - 17 point scale: 0 (entire world) … 16 street level
- `map.setUIToDefault()` → Adds the default behavior and UI elements

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# Simple Map

```
<body onload="initialize()" onunload="GUnload()">
<div id="map_canvas" style="width: 500px; height:
   400px">
</div>
</body>
```

We have to use the same **id** in the JavaScript code

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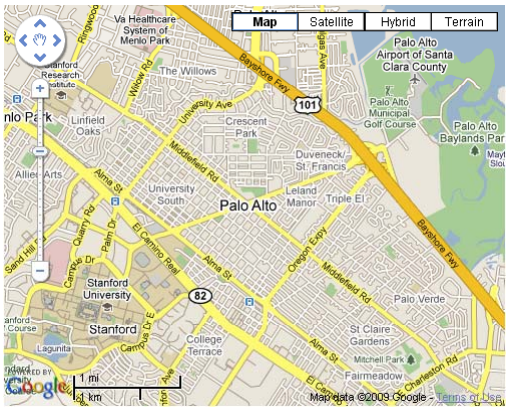

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## Simple Map

```
// map.setUIToDefault();
map.addControl(new GLargeMapControl());
```

`GSmallMapControl()`: Creates a control with buttons to pan in four directions, and zoom in and zoom out.

`GLargeMapControl()`: Creates a control with buttons to pan in four directions, and zoom in and zoom out, and a zoom slider.

`GSmallZoomControl()`: Creates a control with buttons to zoom in and zoom out.

`GLargeMapControl3D()`: Creates a new 3D-style control with buttons to pan in four directions, and zoom in and zoom out, and a zoom slider.

`GSmallZoomControl3D()`: Creates a new 3D-style control with buttons to zoom in and zoom out.

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## Simple Map

- **EXERCISE**
- In the previous map, show the user interface for a large map

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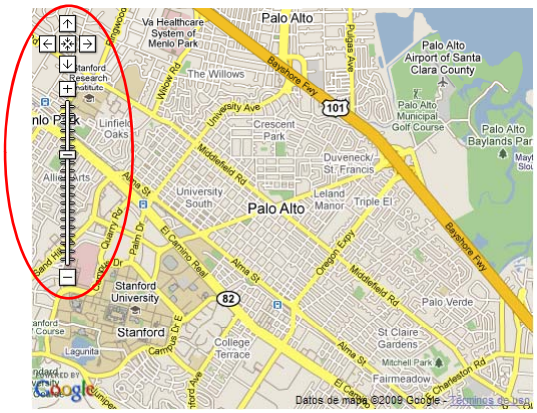


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# Simple Map

- Control for selecting and switching between map types:

```
// map.setUIToDefault();
map.addControl(new GLargeMapControl());
map.addControl(new GMapTypeControl());
```

`GMapTypeControl()`: Creates a standard map type control for selecting and switching between supported map types via buttons.

`GMenuMapTypeControl()`: Creates a drop-down map type control for switching between supported map types.

`GHierarchicalMapTypeControl()`: Creates a "nested" map type control for selecting and switching between supported map types via buttons and nested checkboxes.

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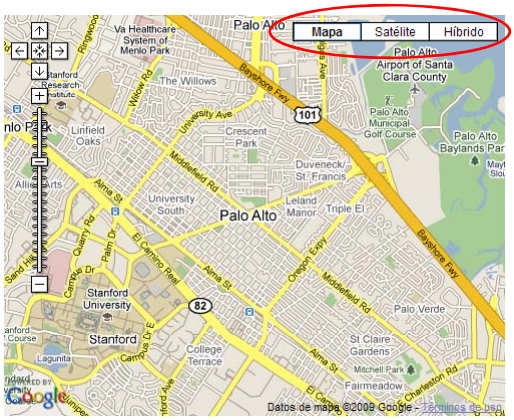




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# Simple Map

```
// map.setUIToDefault();
map.addControl(new GLargeMapControl());
map.addControl(new GMapTypeControl());
map.addControl(new GScaleControl());
map.addControl(new GOverviewMapControl());
```

`GScaleControl()`: Creates a control that displays the map scale.

`GOverviewMapControl()`: Creates a collapsible overview mini-map in the corner of the main map for reference location and navigation (through dragging). The GOverviewMapControl creates an overview map with a one-pixel black border. Note: Unlike other controls, you can only place this control in the bottom right corner of the map (G_ANCHOR_BOTTOM_RIGHT).

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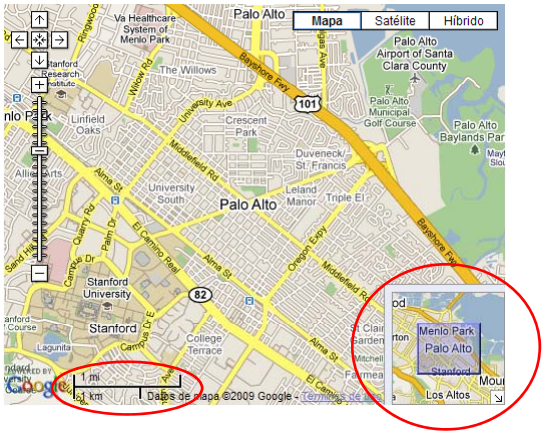




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# Simple Map

- By default, the normal view will be displayed
- However, the map type can be changed to several map types with `map.setMapType()`:
  - `G_NORMAL_MAP`: This map type (which is the default) displays a normal street map.
  - `G_SATELLITE_MAP`: This map type displays satellite images.
  - `G_HYBRID_MAP`: This map type displays a transparent layer of major streets on satellite images.
  - `G_PHYSICAL_MAP`: This map type displays maps with physical features such as terrain and vegetation. This map type is not displayed within map type controls by default.

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# Simple Map

- Special map types:
  - G_SKY_VISIBLE_MAP: This map type shows a mosaic of the sky, covering the full celestial sphere.
  - G_MOON_ELEVATION_MAP: This map type displays a shaded terrain map of the surface of the Moon, color-coded by altitude. This map type is not displayed within map type controls by default.
  - G_MOON_VISIBLE_MAP: This map type displays photographs taken from orbit around the moon. This map type is not displayed within map type controls by default.

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# Simple Map

- Special map types:
  - G_MARS_ELEVATION_MAP: This map type displays a shaded relief map of the surface of Mars, color-coded by altitude. This map type is not displayed within map type controls by default.
  - G_MARS_VISIBLE_MAP: This map type displays photographs taken from orbit around Mars. This map type is not displayed within map type controls by default.
  - G_MARS_INFRARED_MAP: This map type displays a shaded infrared map of the surface of Mars, where warmer areas appear brighter and colder areas appear darker.

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# Simple Map

- By default, the Map, Satellite, and Terrain map types are available
  - We can control the available map types through a list that is provided in the `GMap2()` constructor:

```
var map = new
  GMap2(document.getElementById("map_canvas"),
  {mapTypes: [G_HYBRID_MAP, G_SATELLITE_MAP]});
```

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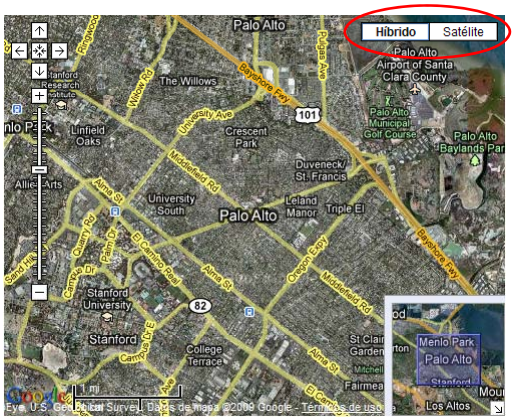

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## Simple Map

- **EXERCISE**
- Map centered in Voronezh
- Zoom level: 14
- Size: 600x400
- Limit map types to hybrid and satellite
- Add the following user controls:
  - Large map control
  - Map type control
  - Scale control
  - Overview control

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## Markers

- Most important and useful feature of Google Maps API:
  - We can add some points (markers) with information to the map → We can show our data → We can create our own applications and services
- The `GMarker()` constructor is used to create icons showing points of interest

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## Markers

- Add a marker:

```
// Latitude and longitude of the new marker
var point = new GLatLng(lat, lon);
// Create a new marker
var marker = new GMarker(point);
// Add the marker to the map
map.addOverlay(marker);
```

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## Markers

- Delete a marker:

```
var point = new GLatLng(lat, lon);
var marker = new GMarker(point);
map.addOverlay(marker);
// ...
// Delete a specific marker
map.removeOverlay(marker);
// Delete all the markers
map.clearOverlays();
```

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## Markers

- **EXERCISE**
- Show a map centered in Voronezh
- Show a list (`<select>`) with different places in Voronezh
- When the user selects a place, show a marker in the map
- Show a button to delete all the markers on the map

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## Markers

- `GMarkerManager` class is used to efficiently manage hundreds of markers on a map
  - Without the use of this class, the performance of the application can be very poor
  - This class can also be used to reduce the clutter of these markers when viewed at certain map scales

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# Markers

- `addMarkers(markers:GMarker[], minZoom:Number, maxZoom?:Number):` Adds a batch of markers to this marker manager. The markers are not added to the map, until the refresh() method is called.
- `addMarker(marker:GMarker, minZoom:Number, maxZoom?:Number):` Adds a single marker to a collection of markers controlled by this manager. If the marker's location falls within the map's current viewport and the map's zoom level is within the specified zoom level rage, the marker is immediately added to the map.
- `refresh()`: Forces the manager to update markers shown on the map. This method must be called if markers were added using the addMarkers method.

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# Markers

```
// Creates a new marker manager
var mkmgr = new GMarkerManager(map);
…
mkmgr.addMarker(new GMarker(point1), 13, 17);
mkmgr.addMarker(new GMarker(point2), 13, 17);
mkmgr.addMarker(new GMarker(point3), 13, 17);
…
mkmgr.refresh();
```

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# Markers

- **EXERCISE**
- Show a map centered in Voronezh
- Show a list (`<select>`) with different places in Voronezh
- When the user selects a place, show a marker in the map
- Show a button to delete the markers on the map
- Center the map in the marker:

```
var point = new GLatLng(lat, lon);
var marker = new GMarker(point);
…
map.panTo(point);
```



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# Markers

- **EXERCISE**
- Create a web page that shows the different places a person has visited during a trip
- User interface:
  - Button "Star trip": the code starts to show a marker for every place every three seconds
  - Button "Stop trip"
- Use `setInterval()` to execute some code after a specified time-interval
- Use `clearInterval()` to stop the timer

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# Markers

- **EXERCISE**
- Create a web page that allows the user to add markers to a map
- User interface:
  - **Latitude** input box
  - **Longitude** input box
  - **Add marker** button
  - **Remove markers** button: remove all markers from the map

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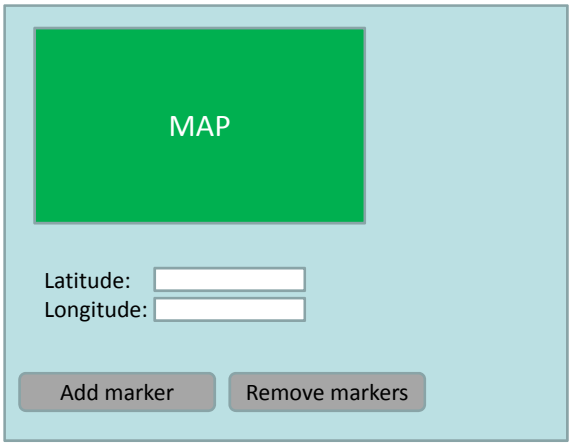
# Markers



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## Markers

- Show a small map over a marker:

```
marker.showMapBlowup();
```

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## Markers

- A marker has options, e.g. allow a marker to be moved:

```
var options = {draggable: true};
marker = new GMarker(point, options);
marker.enableDragging();
```

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## Markers

- How to change the icon of a marker:

```
var myIcon = new GIcon(G_DEFAULT_ICON);
myIcon.image = "my_custom_icon.png";
myIcon.iconSize = new GSize(22, 31);
myIcon.shadow = "my_custom_icon_shadow.png";
myIcon.shadowSize = new GSize(42, 31);
myIcon.iconAnchor = new GPoint(10, 29);
myIcon.infoWindowAnchor = new GPoint(10, 14);
myIcon.printImage = "my_custom_icon_print.gif";
myIcon.mozPrintImage = "my_custom_icon_mozPrint.gif";
myIcon.printShadow = "my_custom_icon_printShadow.gif";
myIcon.transparent = "my_custom_icon_transparent.png";
myIcon.imageMap = [ 10,29, 1,16, 0,5, 5,0, 12,4, 18,2,
   21,12, 21,16 ];
```

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## Events

- Events are "external stimulus" to the map and are usually triggered by the user
  - We can write code that responds to any of the defined events

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## Events

- There exist different types of events
- Each event gets different parameters
- In order to catch events, an event handler or event listener must be defined for an element (map, marker, …) and for an event (click, move, …)

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## Events

- Example:
  - Event listener for click event on a map:

```
var map = new GMap2(...);

GEvent.addListener(map, "click",
  function(overlay, latlng) {
  // Action in response to the event
}
```

## Events

- Main events:
  - `click`
  - `dblclick`
  - `move, movestart, moveend`
  - `drag, dragstart, dragend`
  - `mouseover, mouseout, mousemove`

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## Info Window

- We can add a pop-up window to display information about the markers
  - But information window can be placed anywhere on a map

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## Info Window

- Write an info window with HTML in the middle of the map:

```
var html = "A simple <b>text</b>";
map.openInfoWindowHtml(map.getCenter(), html);
```

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## Info Window

- Write a tabbed info window with HTML in the middle of the map:

```
var info = [
new GInfoWindowTab("School", "Lublin"),
new GInfoWindowTab("Hospital", "Warsaw"),
new GInfoWindowTab("Culture", "Krakow")
];

map.openInfoWindowTabsHtml(map.getCenter(),
  info);
```

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## Info Window

- Show information in a marker:

```
var point = new GLatLng(lat, lon);
map.addOverlay(new GMarker(point));
marker.openInfoWindowHtml("Something we want
  to show");

// We can also use:
// marker.openInfoWindowTabsHtml(tabs);
```

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## Info Window

- **EXERCISE**
- Show an information window when the user clicks on a map

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# Info Window

- **SOLUTION:**
  - An event listener for event `click` must be defined in the map:

```
GEvent.addListener(map, "click", function(overlay,
   latlng) {
  map.openInfoWindowHtml(latlng, "Some text we want
   to show");
});
```

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# Info Window

- **EXERCISE**
- Show an information window when the user clicks on a map
- In the information window, show the coordinates (latitude and longitude) of the clicked point

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## Info Window

- **SOLUTION**
  - An event listener for event `click` must be defined in the map
  - The second parameter of the event listener are the coordinates

```
GEvent.addListener(map, "click", function(overlay,
   latlng) {
map.openInfoWindowHtml(latlng, "Latitude: " +
   latlng.lat() + "<br />Longitude: " +
   latlng.lng());
});
```

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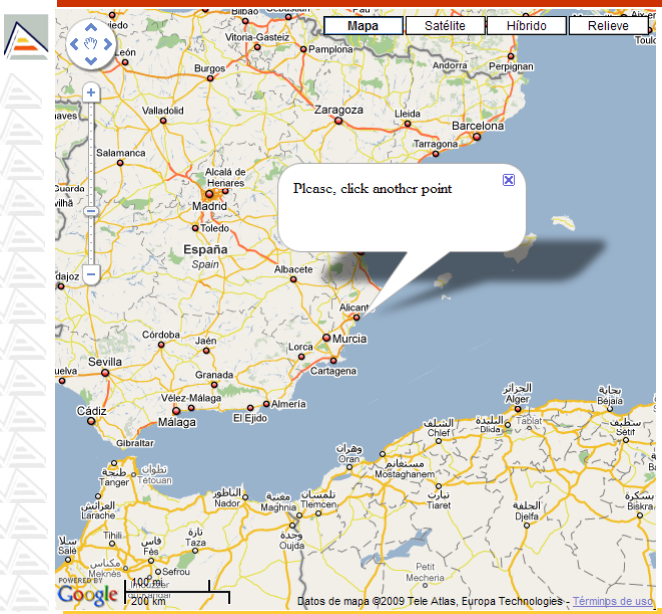
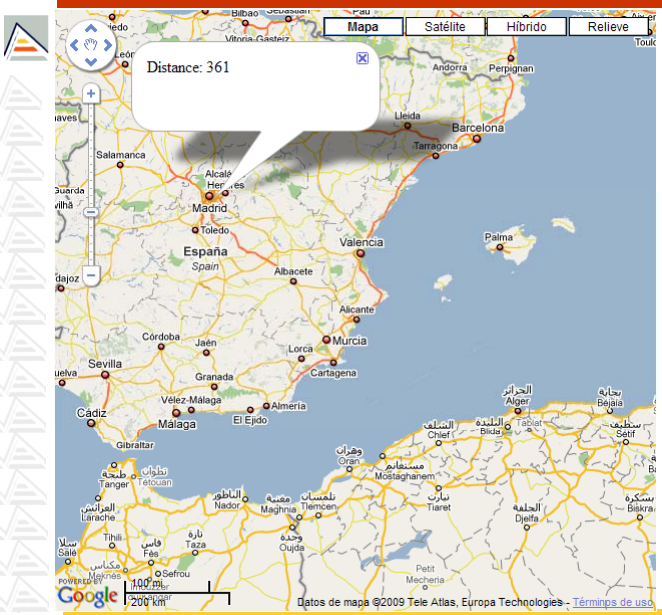
## Info Window

- **EXERCISE**
- The user clicks two points in a map
- Use function `latlng2.distanceFrom(latlng1)` to calculate the distance in meters between two points


Mapa
Satélite
Híbrido
Relieve
Please, click another point
España
Spain
Datos de mapa ©2009 Tele Atlas, Europa Technologies - Términos de uso




Mapa
Satélite
Híbrido
Relieve
Distance: 361
España
Spain
Datos de mapa ©2009 Tele Atlas, Europa Technologies - Términos de uso

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# Info Window

- **EXERCISE**
- We want to show an info window over a marker when we click the marker

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# Info Window

- **SOLUTION**
- We have to add an event handler for a "click" to the marker:

```
GEvent.addListener(marker, "click", function() {
  marker.openInfoWindowHtml("Something we want to
   show");
});
```

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# Info Window

- **EXERCISE**
- Create a web page that allows the user to add markers to a map
- User interface:
  - **Latitude** input box
  - **Longitude** input box
  - **Add marker** button
  - **Remove markers** button: remove all markers from the map
- Add **Content** input box to the previous exercise: user can insert text to show in an info window

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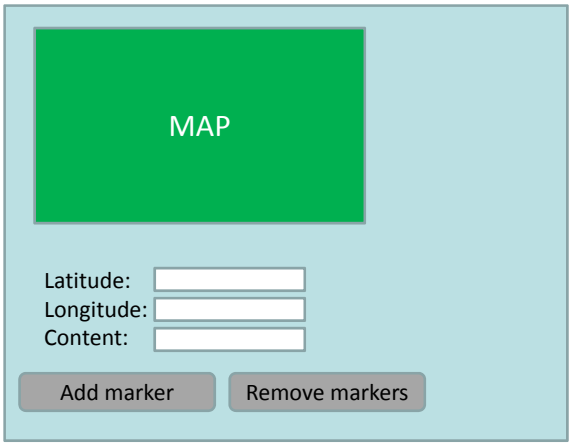
# Info Window



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# Info Window

- **EXERCISE**
- We want to add a new marker with content to a map when we click the map
  - Define `addListener()` for the map to handle the "click event"
  - Create a new marker
    - Ask for the content of the info window of the marker, user JavaScript function `prompt()`
    - Define `addListener()` for the marker to handle the "click event" to show the info window
  - Add the new marker to the map

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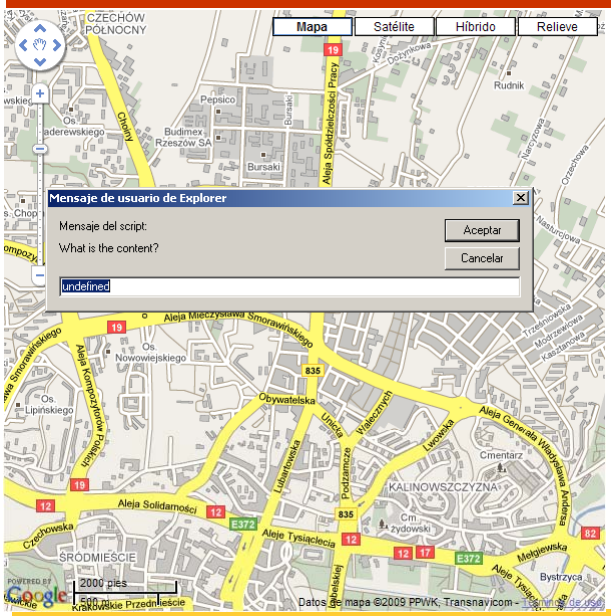

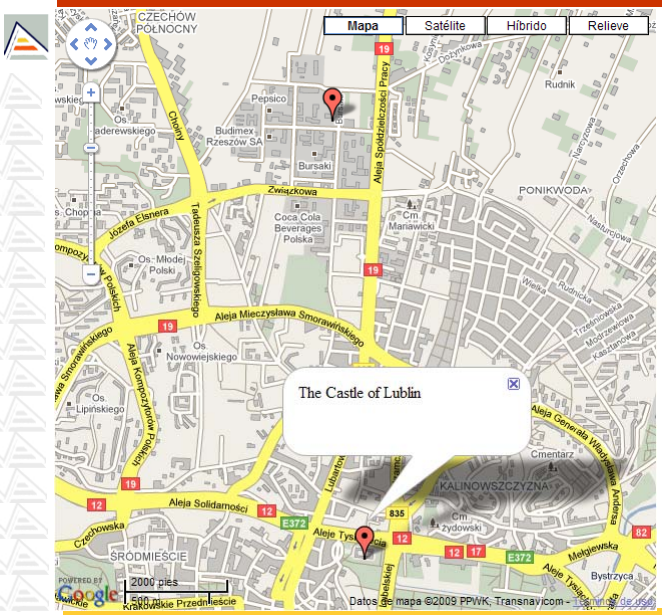




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# Info Window

- **EXERCISE**
- Create a web page that allows the user to find interesting places (museums, restaurants, universities, …) in different cities
- When the user selects a city, the map must be centered in the city
  - Send a request to the server to get the coordinates of the city center
- When the user selects a type of place, markers are shown with the names and descriptions of the places
  - Send a request to the server to get the names, descriptions, and coordinates of the different places

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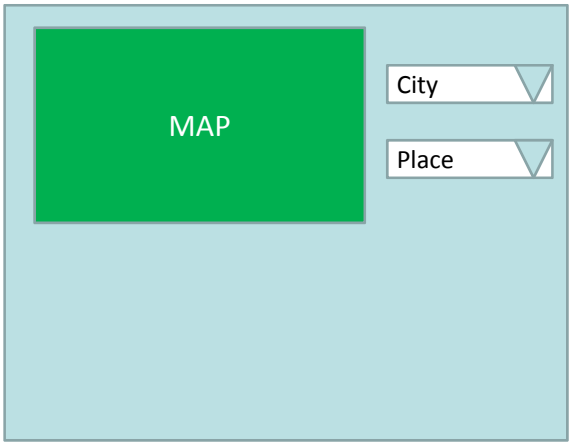
## Info Window



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## Info Window