

Google Charts

<https://developers.google.com/chart/interactive/docs>

1. Download the zip file to **you computer** and unzip it.
2. Use Google Chrome Browser to open these html files. You can just drag each html file to **your Google Chrome Browser**.

3. Visualization: GeoChart

<https://developers.google.com/chart/interactive/docs/gallery/geochart>

3.1 There are five html files in the geochart folder:

region.html

marker.html

proportional.html

text.html

coloring.html

The left screenshot shows a Canvas LMS dashboard for Fall 2022. Under the 'Google Charts' section, there is a link to 'Visualization: GeoChart'. The right screenshot shows the 'Visualization: GeoChart' page on developers.google.com. The page has a navigation bar with 'Home', 'Products', 'Charts', and 'Guides'. Below the navigation, there is a heading 'Visualization: GeoChart' with a 'Send feedback' button. A sidebar on the left lists 'On this page' with links to 'Overview', 'Region GeoCharts', 'Marker GeoCharts', 'Displaying Proportional Markers', 'Text GeoCharts', and '...'. The main content area starts with a definition of a geochart as a map of a country, continent, or region with areas identified in one of three ways: region mode (whole regions like countries, provinces, states), markers mode (circles scaled by value), and text mode (regions labeled with identifiers like Russia or Asia). It also notes that a geochart is rendered using SVG or VML and is a line drawing rather than a terrain map.

3.2 Google console -> APIs -> Enable the following APIs:

Geocoding API

Geolocation API

Maps Embed API

Maps JavaScript API

Maps Static API

The screenshot shows a web browser window with multiple tabs open. The main content is the Google Cloud API Library search results for "Geocoding API".

API Library > "Geocoding API"

Filter Type to filter

Visibility Public (2)

Category Maps (2) Google Enterprise APIs (1)

Geocoding API Google Enterprise API ⓘ
Convert addresses into geographic coordinates (geocoding), which you can use to place markers or position the map. This API also allows you to convert geographic coordinates into an address (reverse geocoding).

Maps JavaScript API Google
Add a map to your website, providing imagery and local data from the same source as Google Maps. Style the map to suit your needs. Visualize your own data on the map, bring the world to life with Street View, and use services like geocoding and directions.

The screenshot shows a web browser window with multiple tabs open. The main content is the Google Cloud Geocoding API page, which displays an overview of the service, its status as API Enabled, and links for Overview, Documentation, and Support. The left sidebar of the browser shows various project management and developer tools like Canvas, SEMO, Apache Web Server, Monitoring MySQL, Ruby, How to Monitor My..., Traefik Reverse Prox..., Log In LinOxide, Load balancing with..., How To Tell If Your..., and Install ProxySQL. The bottom navigation bar includes links for Overview, Documentation, and Support.

Unit 7 Project Instruction: Fall 2020

canvas.semo.edu/courses/16688/pages/unit-7-project-instruction?module_item_id=932110

RPI Geocoding API – APIs & Services

console.cloud.google.com/apis/library/geocoding-backend.googleapis.com?project=core-gearbox-366301

Canvas - SEMO Apache Web Server... Monitoring MySQL... Ruby How to Monitor My... Traefik Reverse Prox... Log In LinOxide... Load balancing with... How To Tell If Your... Install ProxySQL Lo...

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DISMISS ACTIVATE

Google Cloud My Project 682

Geocoding API

Google Enterprise API

Convert between addresses and geographic coordinates.

MANAGE API Enabled

OVERVIEW DOCUMENTATION SUPPORT

Overview

Convert addresses into geographic coordinates (geocoding), which you can use to place markers or position the map. This API also allows you to convert geographic coordinates into an address (reverse geocoding).

Additional details

Type: SaaS & APIs
Last updated: 9/28/22
Category: Google Enterprise APIs, Maps
Service name: geocoding-backend.googleapis.com

Unit 7 Project Instruction: Fall 20 x +

← → C canvas.semo.edu/courses/16688/pages/unit-7-project-instruction?module_item_id=932110

Canva RPI Geolocation API – APIs & Services Incognito (3)

← → C console.cloud.google.com/apis/library/geolocation.googleapis.com?project=core-gearbox-366301 Incognito (3)

Canvas - SEMO Apache Web Server... Monitoring MySQL... Ruby How To Monitor My... Traefik Reverse Prox... Log In LinOxide ... Load balancing w... How To Tell If Your... Install ProxySQL Lo...

Start your Free Trial with \$300 in credit. Don't worry—you won't be charged if you run out of credits. [Learn more](#)

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Account Google Cloud My Project 682

Dashboard Courses Groups Calendar Inbox History Studio Request a Tutor Help and Resources

Geolocation API

Google Enterprise API

Location data from cell towers and WiFi nodes.

ENABLE

OVERVIEW DOCUMENTATION SUPPORT

Overview

Find a location and accuracy radius based on information from things like cell towers and WiFi access points that a mobile client can detect with the Geolocation API. This is primarily used where GPS is not possible or appropriate.

Additional details

Type: SaaS & APIs
Last updated: 9/28/22
Category: Google Enterprise APIs, Maps
Service name: geolocation.googleapis.com

The screenshot shows a web browser window with multiple tabs open. The main content is the Google Cloud Geolocation API page, which displays an overview of the service, its status as 'API Enabled', and links for documentation and support. On the left, there is a vertical sidebar with various icons and labels for different services like Canvas, Apache Web Server, MySQL, and Traefik Reverse Proxy. The top navigation bar includes links for 'Geolocation API - APIs & Services' and 'Incognito (3)'. The address bar at the top shows the URL for the Google Cloud API console.

The screenshot shows a web browser window with multiple tabs open. The active tab is titled "Maps Embed API – APIs & Services". The URL in the address bar is `console.cloud.google.com/apis/library/maps-embed-backend.googleapis.com?project=core-gearbox-366301`. The page content is the "Maps Embed API" documentation from Google Cloud. It features a large "ENABLE" button, an "OVERVIEW" tab, and sections for "Additional details" including type (SaaS & APIs), last updated (9/28/22), category (Google Enterprise APIs, Maps), and service name (maps-embedded-backend.googleapis.com). On the left, there's a vertical sidebar with various icons for Canvas, Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, Request a Tutor, and Help and Resources.

Unit 7 Project Instruction: Fall 2022

← → 🔍 canvas.semo.edu/courses/16688/pages/unit-7-project-instruction?module_item_id=932110

Maps Embed API – APIs & Services

Start your Free Trial with \$300 in credit. Don't worry—you won't be charged if you run out of credits. [Learn more](#)

DISMISS ACTIVATE

Google Cloud My Project 682

Dashboard Courses Groups Calendar Inbox History Studio Request a Tutor Help and Resources

Maps Embed API

Google Enterprise API

Make places easily discoverable with interactive Google Maps.

MANAGE API Enabled

OVERVIEW DOCUMENTATION SUPPORT

Overview

Place an interactive map or Street View panorama on your site with a simple HTTP request using the Maps Embed API. Set the Embed API URL as the src attribute of an iframe to easily embed the map in your webpage or blog.

Additional details

Type: SaaS & APIs
Last updated: 9/28/22
Category: Google Enterprise APIs, Maps
Service name: maps-embed-backend.googleapis.com

Unit 7 Project Instruction: Fall 2022

← → 🔍 canvas.semo.edu/courses/16688/pages/unit-7-project-instruction?module_item_id=932110

Maps JavaScript API – APIs & Services

Start your Free Trial with \$300 in credit. Don't worry—you won't be charged if you run out of credits. [Learn more](#)

DISMISS ACTIVATE

Google Cloud My Project 682

Dashboard Courses Groups Calendar Inbox History Studio Request a Tutor Help and Resources

Maps JavaScript API

Google

Maps for your website

ENABLE

OVERVIEW DOCUMENTATION SUPPORT

Overview

Add a map to your website, providing imagery and local data from the same source as Google Maps. Style the map to suit your needs. Visualize your own data on the map, bring the world to life with Street View, and use services like geocoding and directions.

About Google

Google's mission is to organize the world's information and make it

Additional details

Type: SaaS & APIs
Last updated: 9/28/22
Category: Maps
Service name: maps-backend.googleapis.com

The screenshot shows a web browser window with multiple tabs open. The main content is the "Maps JavaScript API" page from Google Cloud. The URL in the address bar is `console.cloud.google.com/apis/library/maps-backend.googleapis.com?project=core-gearbox-366301`. The page displays information about the API, including a "MANAGE" button and an "API Enabled" status. Navigation tabs at the bottom include "OVERVIEW" (which is active), "DOCUMENTATION", and "SUPPORT". On the left, a sidebar menu lists various services: Canvas, Account, Dashboard, Courses, Groups, Calendar, Inbox, History, Studio, Request a Tutor, Help and Resources, and Incognito (3). The "Groups" icon is highlighted.

The screenshot shows a web browser window with multiple tabs open. The active tab is titled "Maps Static API – APIs & Services". The URL is <https://console.cloud.google.com/apis/library/static-maps-backend.googleapis.com?project=core-gearbox-366301>. The page content is about the Google Maps Static API, which allows embedding maps into web pages with minimal code. It features a large "ENABLE" button. Below the main content, there are tabs for "OVERVIEW", "DOCUMENTATION", and "SUPPORT". On the left side of the browser, there is a vertical sidebar with various icons and links related to the user's account and the project.

The screenshot shows the Google Cloud Platform interface. On the left, there's a sidebar with various icons for Canvas, Courses, Groups, Calendar, Inbox, History, Studio, Request a Tutor, and Help and Resources. The main content area is titled "Maps Static API" under "Google Enterprise API". It says "Simple, embeddable map image with minimal code." and has a "MANAGE" button with a green checkmark indicating "API Enabled". Below this, there are tabs for "OVERVIEW", "DOCUMENTATION", and "SUPPORT". The "OVERVIEW" tab is selected. To the right, there's a section titled "Additional details" with information: Type: SaaS & APIs, Last updated: 9/28/22, Category: Google Enterprise APIs, Maps, and Service name: static-maps-backend.googleapis.com.

The screenshot shows the Google Cloud Platform interface. The sidebar is identical to the previous one. The main content area is titled "API Credentials - APIs & Services". It shows a table for "Enabled APIs & services" with a single row for "Library". Below this, there's a section for "Credentials" with a "CREATE CREDENTIALS" button. A note says "Remember to configure the OAuth consent screen with information about your application." with a "CONFIGURE CONSENT SCREEN" button. There are also sections for "API Keys", "OAuth 2.0 Client IDs", and "Service Accounts".

3.3 Google console -> APIs -> Credentials -> API key -> Copy **your API key** to the **html files**.

Unit

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

new 1 new 2 new 3 coloring.html

```

1 <html>
2   <head>
3     <script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>
4     <script type="text/javascript">
5       google.charts.load('current', {
6         'packages': ['geochart'],
7         // Note: you will need to get a mapsApiKey for your project.
8         // Please replace with your api key.
9         'mapsApiKey': 'AIzaSyCXenShrW07qkIA9Rv_v3K2kcQ4WU4cyQ'
10       );
11       google.charts.setOnLoadCallback(drawRegionsMap);
12 
13     </script>
14   </head>
15   <body>
16     <div id="chart">
17       <script>
18         var data = google.visualization.arrayToDataTable([
19           ['Country', 'Latitude'],
20           ['Algeria', 36], ['Angola', -8], ['Benin', 6], ['Botswana', -24],
21           ['Burkina Faso', 12], ['Burundi', -3], ['Cameroon', 3],
22           ['Canary Islands', 28], ['Cape Verde', 15],
23           ['Central African Republic', 41], ['Ceuta', 35], ['Chad', 12],
24           ['Comoros', -12], ['Côte d'Ivoire', 6],
25           ['Democratic Republic of the Congo', -31], ['Djibouti', 12],
26           ['Egypt', 26], ['Equatorial Guinea', 31], ['Eritrea', 15],
27           ['Ethiopia', 9], ['Gabon', 0], ['Gambia', 13], ['Ghana', 5],
28           ['Guinea', 10], ['Guinea-Bissau', 12], ['Ivory Coast', -11],
29           ['Lesotho', -29], ['Liberia', 1], ['Libya', 32], ['Madagascar', null],
30           ['Madeira', 33], ['Malawi', -14], ['Mali', 12], ['Mauritania', 18],
31           ['Mauritius', -20], ['Mayotte', -13], ['Melilla', 35],
32           ['Morocco', 32], ['Mozambique', -25], ['Namibia', -22],
33           ['Niger', 14], ['Nigeria', 8], ['Republic of the Congo', -11],
34           ['Réunion', -21], ['Rwanda', -2], ['Saint Helena', -16],
35           ['São Tomé and Príncipe', 0], ['Senegal', 15],
36           ['Seychelles', -5], ['Sierra Leone', 8], ['Somalia', 2],
37           ['Sudan', 15], ['South Africa', -30], ['South Sudan', 5],
38           ['Swaziland', -26], ['Tanzania', -6], ['Togo', 0], ['Tunisia', 34],
39           ['Uganda', 1], ['Western Sahara', 25], ['Zambia', -15],
40           ['Zimbabwe', -18]
41         ]);
42 
43         var options = {
44           region: '002', // Africa
45           colorAxis: {colors: ['#00853f', 'black', '#e31b23']},
46           backgroundColor: '#8d4fa4',
47           datalessRegionColor: '#f8bbd0',
48           defaultColor: '#f5f5f5',
49         };
50       </script>
51     </div>
52   </body>
53 </html>

```

Hyper Text Markup Language file

length : 2,558 lines: 55 Ln: 9 Col: 63 Pos: 400 Windows (CR LF) ANSI INS

Unit C:\Users\koira\Downloads\googlechat\googlechat\geochart\marker.html - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window 2

new 1 new 2 new 3 coloring.html marker.html

marker.html

```

1 <html>
2   <head>
3     <script type='text/javascript' src='https://www.gstatic.com/charts/loader.js'></script>
4     <script type='text/javascript'>
5       google.charts.load('current', {
6         'packages': ['geochart'],
7         // Note: you will need to get a mapsApiKey for your project.
8         // See: https://developers.google.com/chart/interactive/docs/basic_load_libs#load-settings
9         // Please replace with your api key.
10        'mapsApiKey': 'AIzaSyC669rw0v7kqIa9Kv_v3kzkcQ4WU4cyQ'
11      });
12      google.charts.setOnLoadCallback(drawMarkersMap);
13
14      function drawMarkersMap() {
15        var data = google.visualization.arrayToDataTable([
16          ['City', 'Population', 'Area'],
17          ['Rome', 2761477, 1285.31],
18          ['Milan', 1324110, 181.76],
19          ['Naples', 959574, 117.27],
20          ['Turin', 907563, 130.17],
21          ['Palermo', 655875, 158.89],
22          ['Genoa', 607906, 243.69],
23          ['Bologna', 380111, 140.71],
24          ['Florence', 371282, 102.41],
25          ['Flumicino', 67370, 213.44],
26          ['Anzio', 52192, 43.43],
27          ['Clampino', 38262, 11]
28        ]);
29
30        var options = {
31          region: 'IT',
32          displayMode: 'markers',
33          colorAxis: {colors: ['green', 'blue']}
34        };
35
36        var chart = new google.visualization.GeoChart(document.getElementById('chart_div'));
37        chart.draw(data, options);
38      }
39    </script>
40  </head>
41  <body>
42    <div id="chart_div" style="width: 900px; height: 500px;"></div>
43  </body>
44</html>

```

Hyper Text Markup Language file length: 1,586 lines: 44 Ln: 10 Col: 62 Pos: 495 Windows (CR LF) UTF-8 INS

Unit C:\Users\koira\Downloads\googlechat\googlechat\proportional.html - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window 2

new 1 new 2 new 3 coloring.html marker.html proportional.html

proportional.html

```

1 <html>
2   <head>
3     <script type='text/javascript' src='https://www.gstatic.com/charts/loader.js'></script>
4     <script type='text/javascript'>
5       google.charts.load('current', {
6         'packages': ['geochart'],
7         // Note: you will need to get a mapsApiKey for your project.
8         // See: https://developers.google.com/chart/interactive/docs/basic_load_libs#load-settings
9         // Please replace with your api key.
10        'mapsApiKey': 'AIzaSyC669rw0v7kqIa9Kv_v3kzkcQ4WU4cyQ'
11      });
12      google.charts.setOnLoadCallback(drawMarkersMap);
13
14      function drawMarkersMap() {
15        var data = google.visualization.arrayToDataTable([
16          ['Country', 'Population', 'Area Percentage'],
17          ['France', 65700000, 50],
18          ['Germany', 81890000, 27],
19          ['Poland', 38540000, 23]
20        ]);
21
22        var options = {
23          sizeAxis: { minValue: 0, maxValue: 100 },
24          region: '155', // Western Europe
25          displayMode: 'markers',
26          colorAxis: {colors: ['#e7711c', '#4374e0']} // orange to blue
27        };
28
29        var chart = new google.visualization.GeoChart(document.getElementById('chart_div'));
30        chart.draw(data, options);
31      }
32    </script>
33  </head>
34  <body>
35    <div id="chart_div" style="width: 900px; height: 500px;"></div>
36  </body>
37</html>

```

Hyper Text Markup Language file length: 1,224 lines: 36 Ln: 9 Col: 62 Pos: 396 Windows (CR LF) UTF-8 INS

```

* C:\Users\koira\Downloads\googlechart\googlechart\geochart\region.html - Notepad+
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window 2
new 1 new 2 new 3 coloring.html marker.html proportional.html region.html text.html
C:\Users\koira\Downloads\googlechart\googlechart\geochart\region.html
1 <html>
2   <head>
3     <script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>
4     <script type="text/javascript">
5       google.charts.load('current', {
6         'packages': ['geochart'],
7         // Note: you will need to get a mapsApiKey for your project.
8         // See: https://developers.google.com/chart/interactive/docs/basic_load_libs#load-settings
9         // Please replace with your api key.
10        'mapsApiKey': 'AIzaSyCX6n9hW0v7kg1A9Kv_v3kZkcQ4WU4cyQ'
11      });
12      google.charts.setOnLoadCallback(drawRegionsMap);
13
14    function drawRegionsMap() {
15      var data = google.visualization.arrayToDataTable([
16        ['Country', 'Popularity'],
17        ['Germany', 200],
18        ['United States', 300],
19        ['Brazil', 400],
20        ['Canada', 500],
21        ['France', 600],
22        ['RU', 700]
23      ]);
24
25      var options = {};
26
27      var chart = new google.visualization.GeoChart(document.getElementById('regions_div'));
28
29      chart.draw(data, options);
30    }
31  </script>
32 </head>
33 <body>
34   <div id="regions_div" style="width: 900px; height: 500px;"></div>
35 </body>
36 </html>

```

length: 1,187 lines: 36 Ln: 10 Col: 63 Pos: 500 Windows (CR LF) UTF-8 INS


```

* C:\Users\koira\Downloads\googlechart\googlechart\geochart\text.html - Notepad+
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window 2
new 1 new 2 new 3 coloring.html marker.html proportional.html region.html text.html
C:\Users\koira\Downloads\googlechart\googlechart\geochart\text.html
1 <html>
2   <head>
3     <script type="text/javascript" src="https://www.gstatic.com/charts/loader.js"></script>
4     <div id="regions_div" style="width: 900px; height: 500px;"></div>
5
6     <script type="text/javascript">
7       google.charts.load('current', {
8         'packages': ['geochart'],
9         // Note: you will need to get a mapsApiKey for your project.
10        // Please replace with your api key.
11        'mapsApiKey': 'AIzaSyCX6n9hW0v7kg1A9Kv_v3kZkcQ4WU4cyQ'
12      });
13      google.charts.setOnLoadCallback(drawRegionsMap);
14
15    function drawRegionsMap() {
16      var data = google.visualization.arrayToDataTable([
17        ['Country', 'Popularity'],
18        ['South America', 600],
19        ['Canada', 500],
20        ['France', 600],
21        ['Russia', 700],
22        ['Australia', 600]
23      ]);
24
25      var options = { displayMode: 'text' };
26
27      var chart = new google.visualization.GeoChart(document.getElementById('regions_div'));
28
29      chart.draw(data, options);
30    }
31  </script>
32 </head>
33 <body>
34   <div id="chart_div" style="width: 900px; height: 500px;"></div>
35 </body>
36 </html>

```

length: 1,078 lines: 36 Ln: 11 Col: 59 Pos: 447 Windows (CR LF) UTF-8 INS

4. Upload these html files to **your AWS EC2 instance** and run them from **your local machine**.

4.1 Download the googlechart.zip file from your Canvas to the ubuntu virtual machine (in the folder ~/Downloads) on your **local computer**.

4.2 Make sure your pem file is in the folder ~/Downloads on your **local ubuntu virtual machine**.

```
ubuntu@ubuntu:~/Downloads$ cd Downloads/
ubuntu@ubuntu:~/Downloads$ tree googlechat/
googlechat/
├── area.html
├── bar.html
├── bubble.html
├── candlestick.html
├── column.html
├── combo.html
├── gauge.html
└── geochart
    ├── coloring.html
    ├── marker.html
    ├── proportional.html
    ├── region.html
    └── text.html

├── histogram.html
├── line.html
├── org.html
├── pie3d.html
└── pie.html

├── scatter.html
└── steps.html

├── candle.html
└── timeline.html

└── tree.html

2 directories, 22 files
```

```
ubuntu@ubuntu:~/Downloads$ ls
dcc_lab.pem  googlechat.zip
ubuntu@ubuntu:~/Downloads$
```

4.3 scp the zip file from **your local ubuntu virtual machine** (in the folder `~/Downloads`) to **your EC2 instance** (in the folder `/var/www/html`).

```
Unit  ubuntu@ubuntu: ~/Downloads
←  →  googlechat.zip
ubuntu@ubuntu:~/Downloads$ scp -i dcc_lab.pem googlechat.zip ubuntu@3.135.189.221:/tmp
100% 172   1.3KB/s  00:00
```

The terminal window shows the user running the `scp` command to transfer a file named `googlechat.zip` from their local machine to an EC2 instance. The file is transferred via the private key `dcc_lab.pem` and is saved to the `/tmp` directory on the EC2 instance.

4.4 Unzip the zip file on your EC2 instance.

```
Unit  root@ip-172-31-4-45: /var/www/html
←  →  drwxr-xr-x 3 root root 4096 Oct 22 02:16 .
drwxr-xr-x 2 root root 4096 Oct 22 02:00 googlechat
-rw-r--r-- 1 root root 172 Oct 22 02:23 googlechat.zip
Canverroot@ip-172-31-4-45:/var/www/html#
```

The terminal window shows the user running the `ls` command to list the contents of the `/var/www/html` directory on the EC2 instance. The directory contains a folder named `.`, a file named `googlechat`, and a file named `googlechat.zip`.

On your remote AWS EC2 instance:

```
$ cd /var/www/html/
```

```
$ ls
```

```
# make sure you can find the file googlechart.zip  
$ unzip googlechart.zip  
$ sudo chmod -R 755 googlechart  
5. Access each html file from your local windows machine.  
Google Chrome Browser -> http://ec2-18-216-155-172.us-east-  
2.compute.amazonaws.com/googlechart/bar.html  
# Please replace with your host name.
```







