

Introduction to GEE Code Editor



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About GEE



Datasets

Petabyte-scale catalog of public and free-to-use geospatial datasets.



Compute

Leverage Google's cloud platform for planetary-scale analysis of Earth science data.



APIs

Full-featured JavaScript, Python and REST APIs.



Apps

Dynamic, publicly accessible user interfaces for Earth Engine analyses.

Source: <https://developers.google.com/earth-engine>

Earth Engine is a public data catalog, compute infrastructure, geospatial APIs and an interactive app server

Familiarisation with EE Code Editor

The screenshot shows the Google Earth Engine Code Editor interface. The top navigation bar includes 'Script manager', 'API documentation', 'Asset manager', 'Search for datasets or places', 'Get a link (URL) to the script', 'Save the script', 'Run the script', 'Help button', and 'Feedback button'. The main workspace is divided into three panes: 'Scripts' (left), 'Code Editor' (center), and 'Inspector/Console/Tasks' (right). The 'Code Editor' pane contains a JavaScript script for cloud masking. The 'Inspector/Console/Tasks' pane shows 'Task manager', 'Console output', and 'Inspect locations, pixel values, objects on the map'. At the bottom, the 'Map' pane includes 'Geometry Tools' and 'Zoom' controls, and a 'Layer manager' on the right side.

Source: <https://developers.google.com/earth-engine/guides/playground>

- Web based IDE for the Earth Engine Javascript API
- All you need to run the Code Editor is a web browser (Google Chrome for best results) and an internet connection

Components of EE Code Editor



Central Panel – Main Window

- JavaScript code editor
- Save, Run, Get Link, Reset, Settings buttons

Left Panel for input management

- Script Manager (Scripts tab)
- API documentation (Docs tab)
- Asset Manager (Assets tab)

<https://code.earthengine.google.com/>

Right Panel for output management

- Interactive map query (Inspector tab)
- Console output (Console tab)
- Task Manager (Tasks tab)

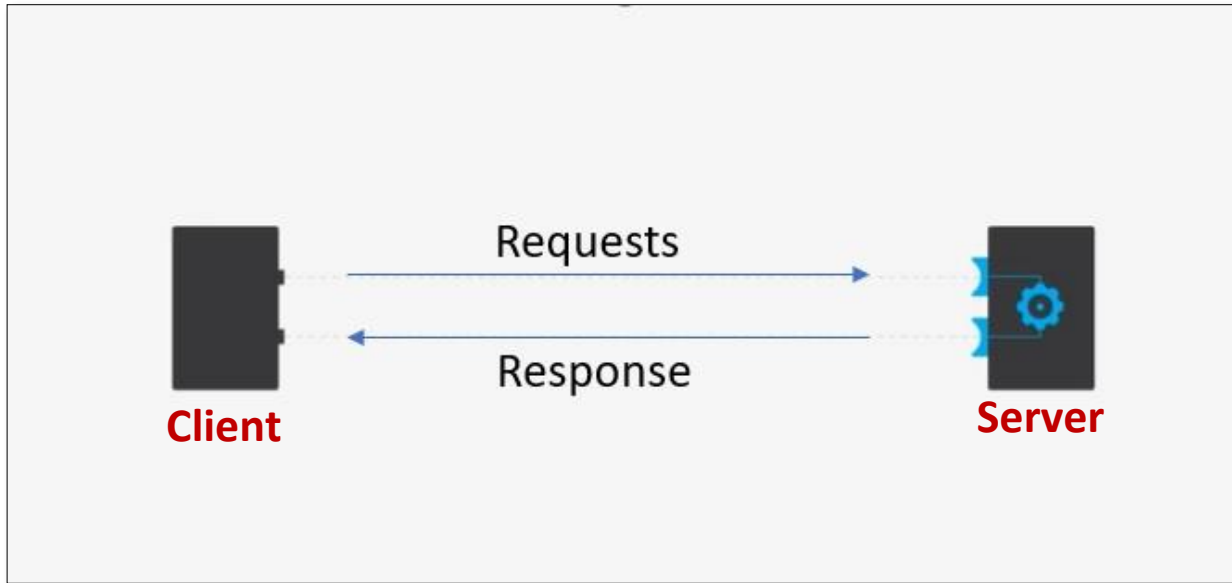
Map Panel for visualizing geospatial datasets

- Geometry tools
- Layer Manager

Header

- Search box to find datasets or places
- Help and Feedback buttons

How EE works?



What is an API : <https://www.mulesoft.com/resources/api/what-is-an-api>

- Scripts written on code editor are sent to Google servers for processing and generated Map tiles and/or messages are sent back for display in Map Panel and/or Console

Javascript for Earth Engine



- EE Code Editor Scripts are made up of Javascript Statements
- Basic knowledge of Javascript data types viz., String, Number, List, Dictionary/Object is required
- Since we use the API with Javascript all functionalities of this language can be used
- New variables and functions/methods are needed to connect client and server. These are generally initialized with `ee`. These are client-side 'proxy' objects in your script that send information to the server
- JavaScript objects and primitives are put into `ee` containers for sending to the server and processing at Google Computational facility

```
var a = 3;                                var a = ee.Number(3);  
var cliString = 'I am a String';          var serString = ee.String('I am not a string')
```

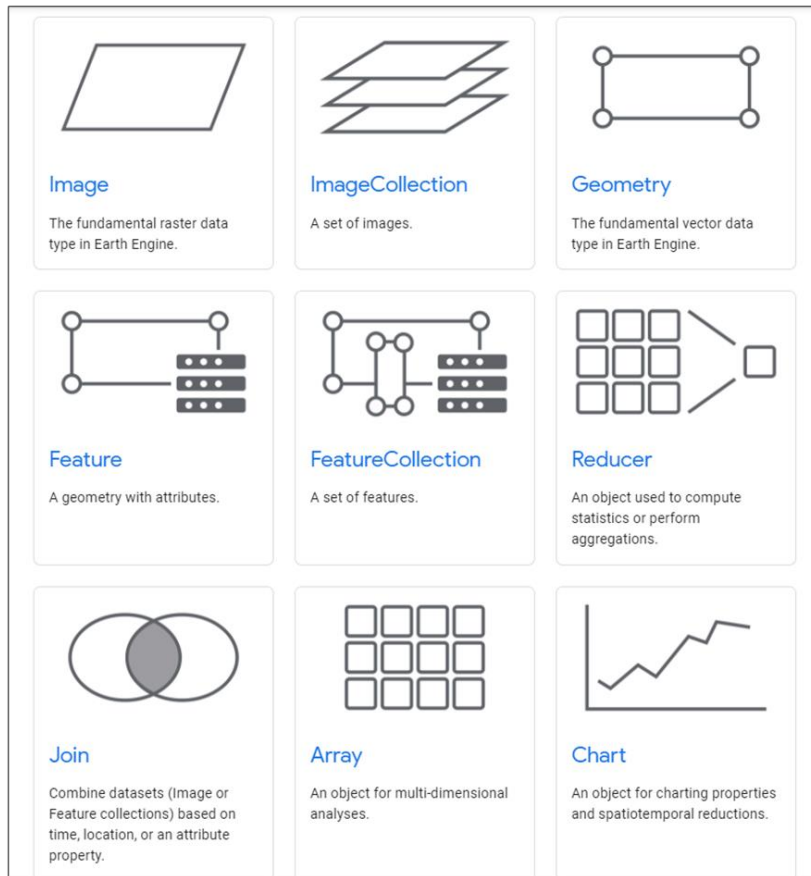
- Client doesn't know what's in the container, but it can be found by printing it with `print()`

Introduction to JavaScript for Earth Engine: https://developers.google.com/earth-engine/tutorials/tutorial_js_01

Link to Repository: https://code.earthengine.google.com/?accept_repo=users/chaitanyaks/NWA_Feb_2021

EE Objects and Methods

- EE API is composed of Objects and Methods/Functions
- Objects represent data types for eg Raster images, Vector Features, Numbers and Strings
- Each of these objects belongs to a specific class for eg. Image, Image Collection etc., and each class has a strict list of functions/methods available



Common EE Object Classes

Object is a specific instance of a Class

EE Objects and Methods



- List of EE Object classes and their methods can be found under Docs tab in Code Editor
- Arguments to EE methods can be passed in order of parameters as defined within parentheses or in any order by name by passing a javascript object with `key(parameter):value(argument)` pairs. **Helps in better Readability and Reusability**
- Earth Engine uses a parallel processing system to carry out computation across a large number of machines
- Use of ‘for loops’, ‘if/else conditionals’ generally used in procedural programming is discouraged in EE in favor of functional approach making use of `map()` operation, filters etc.,

Thank you