



# Introduction to Google Earth Engine (GEE)

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# What is GEE?

## ◆ Google Earth Engine = geospatial processing service

- Multi-petabyte analysis-ready data catalog
- High-performance parallel computation
- Internet-accessible application programming interface (API) & web-based interactive development environment (IDE) □ rapid prototyping & visualization
- <https://earthengine.google.com/>

About Google Earth Engine

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



Datasets

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

[Explore the Data Catalog](#)



Compute

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

[Read the publication](#)



APIs

Full-featured JavaScript, Python and REST APIs.

[Developer guides](#)



Apps

Dynamic, publicly accessible user interfaces for Earth Engine analyses.

[Apps gallery](#)

# What is GEE?

## ◆ Access to GEE: (1) JavaScript (2) Python

### How to use Google Earth Engine

Connect to the Earth Engine service through one of the APIs. Client libraries for JavaScript and Python translate complex geospatial analyses to Earth Engine requests. Or connect directly to Earth Engine servers using the REST API.



JavaScript

Interactive JavaScript using the [Code Editor](#), the open source JavaScript library in Node.js ([learn more about Earth Engine in Node.js](#)), or [Earth Engine Apps](#).

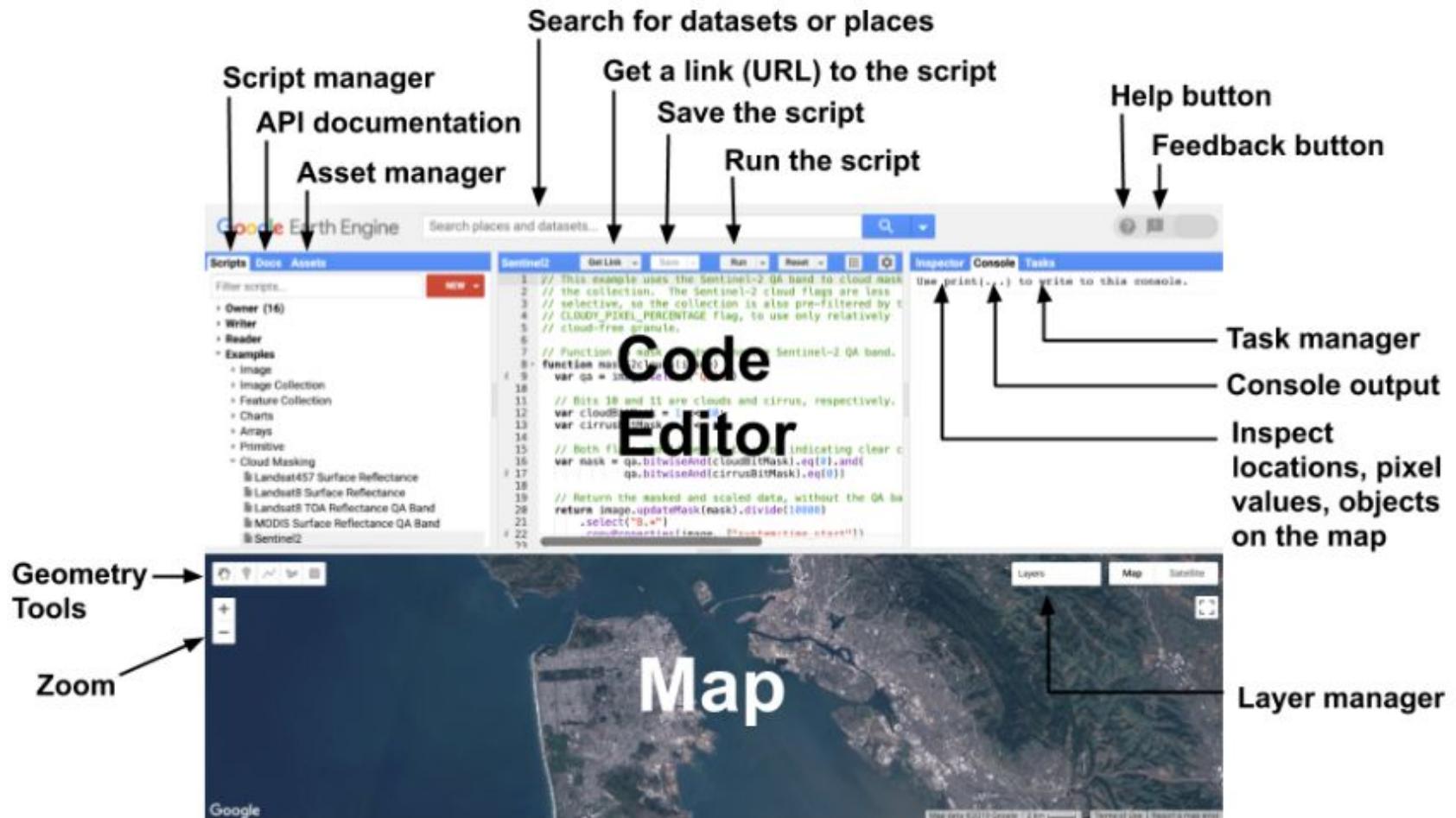


Python

The [open source Python library](#) running in [Colab](#), your [Python environment](#), or [App Engine](#) ([learn more about Earth Engine powered App Engine apps](#)).

# GEE JavaScript API

- ◆ Code Editor: <https://code.earthengine.google.com/>



# GEE Python API

- ❖ **JavaScript: Web-based IDE**
- ❖ **Python: Local machine IDE**
  - Python API does not support visual output
  - Require additional process to visualize output

Home > Products > Google Earth Engine > Guides

Was this helpful?  

## Python Installation



[Send feedback](#)

! Keep your client library up to date by running the command for the package manager you used to install `earthengine-api`:

- [Conda Package Manager](#): `conda update -c conda-forge earthengine-api`
- [Python Package Installer](#): `pip install earthengine-api --upgrade`

Here is a short script that tests if you have working installation:

```
import ee
ee.Authenticate()
ee.Initialize()
print(ee.Image("NASA/NASADEM_HGT/001").get("title"). getInfo())
```

# Python

## ◆ Programming language

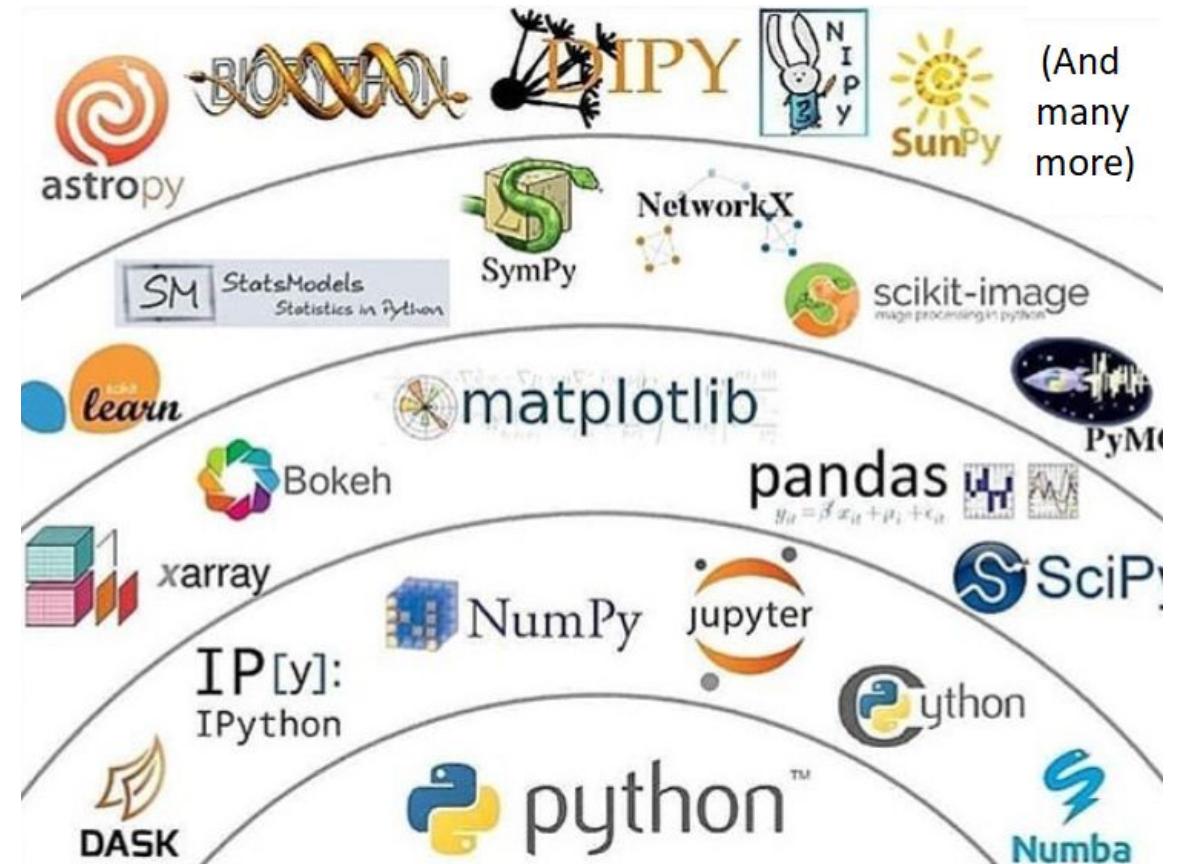
- High level (easy language)
- Object oriented

## ◆ Advantages of using Python

- Simple code layout
- Easy to learn & implement
- Massive libraries (modules)
- Easy debugging
- Open-source

## ◆ Disadvantages

- Low speed
- Inefficient memory consumption



# Google Colab

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- ❖ Python interactive Programming environments
- ❖ Free Jupyter notebook environment that runs entirely in the cloud
- ❖ Advantages of Google Colab
  - Pre-installed libraries
  - Save/share scripts on the cloud
  - Free GPU



# Tutorials

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## ◆ GitHub page

- [https://github.com/YoungHyunKoo/GEE\\_Fall2025](https://github.com/YoungHyunKoo/GEE_Fall2025)