Lab 4: Using ChatGPT to Write and Understand Google Earth Engine (GEE) Code

Objective:
This lab introduces participants to using ChatGPT as a tool to generate, explain, and troubleshoot GEE code. It builds directly on Lab 3, where participants used NDVI and rainfall data to explore malaria risk. Here, they learn to use AI to support and expand those analyses.

Materials Needed:

- ChatGPT access
- Google Earth Engine account and Code Editor
- Output layers from Lab 3 (NDVI and Rainfall)

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1. Why Use ChatGPT with GEE?

- ChatGPT helps generate code from plain-language prompts.
- It assists with debugging and explains unfamiliar functions.
- It accelerates learning and supports project development.

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2. Example Prompts and What They Do

Prompt 1: Load NDVI for Uganda

```
Write a GEE script to load MODIS NDVI for Uganda in 2022 and display it on
the map.
```

ChatGPT will return a ready-to-use script similar to what you wrote in Lab 3.

Prompt 2: Combine NDVI and rainfall layers

```
How do I stack NDVI and rainfall as a multiband image in GEE?
```

Useful for Lab 5's AI clustering activity.

Prompt 3: Export layers to Google Drive

```
Help me export my NDVI image clipped to Uganda as a GeoTIFF.
```

ChatGPT can generate and explain the `Export.image.toDrive()` function.

Prompt 4: Fix an error

```
Why does this GEE error say 'filter is not a function'?
```

ChatGPT identifies syntax issues and offers corrections.

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3. Practice Activity: Prompt and Execute

Task: Use ChatGPT to:

1. Write a GEE script to visualize CHIRPS rainfall for Uganda.
2. Explain how to change the color ramp.
3. Ask how to export the rainfall image to Drive.
4. Try modifying the time range to show a specific season.

Copy and paste the AI-generated code into the GEE Code Editor to test.

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4. Prompt Writing Tips

- Be clear and specific.
- Include dataset, location, and time range.
- Ask for explanations when needed.

Example Template:

```
Write a GEE script to [goal] using [dataset] for [region] in [time period].
```

Outcome:
By the end of Lab 4, participants will be comfortable using ChatGPT to assist with coding in GEE, enabling them to confidently approach the AI-based analysis in Lab 5.

Transition to Lab 5:
In the next lab, you will use ChatGPT to help write an unsupervised classification script and map malaria risk clusters based on the NDVI and rainfall data you've explored.