Google Colab

Ramiro Logares

Intro

- Google Colab, short for Google Colaboratory, is a cloud-based Jupyter Notebook environment provided by Google for free for small tasks
- It allows users to create, edit, and share Python notebooks without the need to install any software on their local machines (runs bash and R too)
- Colab is designed to facilitate collaboration, making it easy for multiple users to work on a project simultaneously
- It also provides access to more powerful resources, such as GPUs and TPUs, for accelerated computing

Key Features

- Real-time collaboration: work with your colleagues simultaneously
- Version control: track changes and revert to previous versions
- Rich text and markdown support: create well-documented notebooks
- Integration with Google Drive: store and share notebooks easily

Getting Started

- Visit https://colab.research.google.com
- Sign in with your Google account
- Create a new Python notebook or open an existing one
- Start coding and running cells

Welcome To Colab

File Edit View Insert Runtime Tools Help

Share Gemini

Commands + Code + Text Copy to Drive Connect

Table of contents

- Getting started
- Data science
- Machine learning
- More Resources
  - Featured examples
- + Section

Welcome to Colab!

Explore the Gemini API

The Gemini API gives you access to Gemini models created by Google DeepMind. Gemini models are built from the ground up to be multimodal, so you can reason seamlessly across text, images, code, and audio.

How to get started?

1. Go to Google AI Studio and log in with your Google account.
2. Create an API key.
3. Use a quickstart for Python, or call the REST API using curl.

Discover Gemini's advanced capabilities

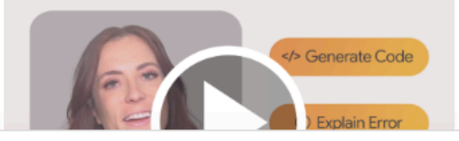
- Discover the multimodal Live API (demo here).
- Learn how to analyze images and detect items in your pictures using Gemini (bonus, there's a 3D version as well!).
- Unlock the power of Gemini thinking model, capable of solving complex task with its inner thoughts.

Explore complex use cases

- Use Gemini grounding capabilities to create a report on a company based on what the model can find on internet.
- Extract invoices and form data from PDF in a structured way.
- Create illustration based on a whole book using Gemini large context window and Imagen.

To learn more, check out the Gemini cookbook or visit the Gemini API documentation.

Colab now has AI features powered by Gemini. The video below provides information on how to use these features, whether you're new to Python, or a seasoned veteran.



colab.research.google.com/#scrollTo=Wf5KrEb6vrkR

Relaunch to update

Welcome To Colab

File Edit View Insert Runtime Tools Help

Share Gemini

Connect

- New notebook in Drive
- Open notebook ⌘/Ctrl+O
- Upload notebook
- Rename
- Save a copy in Drive
- Save a copy as a GitHub Gist
- Save a copy in GitHub
- Save ⌘/Ctrl+S
- Revision history
- Download
- Print ⌘/Ctrl+P

elcome to Colab!

plore the Gemini API

Gemini API gives you access to Gemini models created by Google DeepMind. Gemini models are built from the ground up to be timodal, so you can reason seamlessly across text, images, code, and audio.

w to get started?

1. Go to Google AI Studio and log in with your Google account.
2. Create an API key.
3. Use a quickstart for Python, or call the REST API using curl.

cover Gemini's advanced capabilities

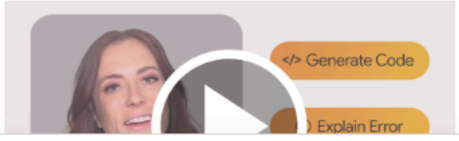
- Discover the multimodal Live API (demo here).
- Learn how to analyze images and detect items in your pictures using Gemini (bonus, there's a 3D version as well!).
- Unlock the power of Gemini thinking model, capable of solving complex task with its inner thoughts.

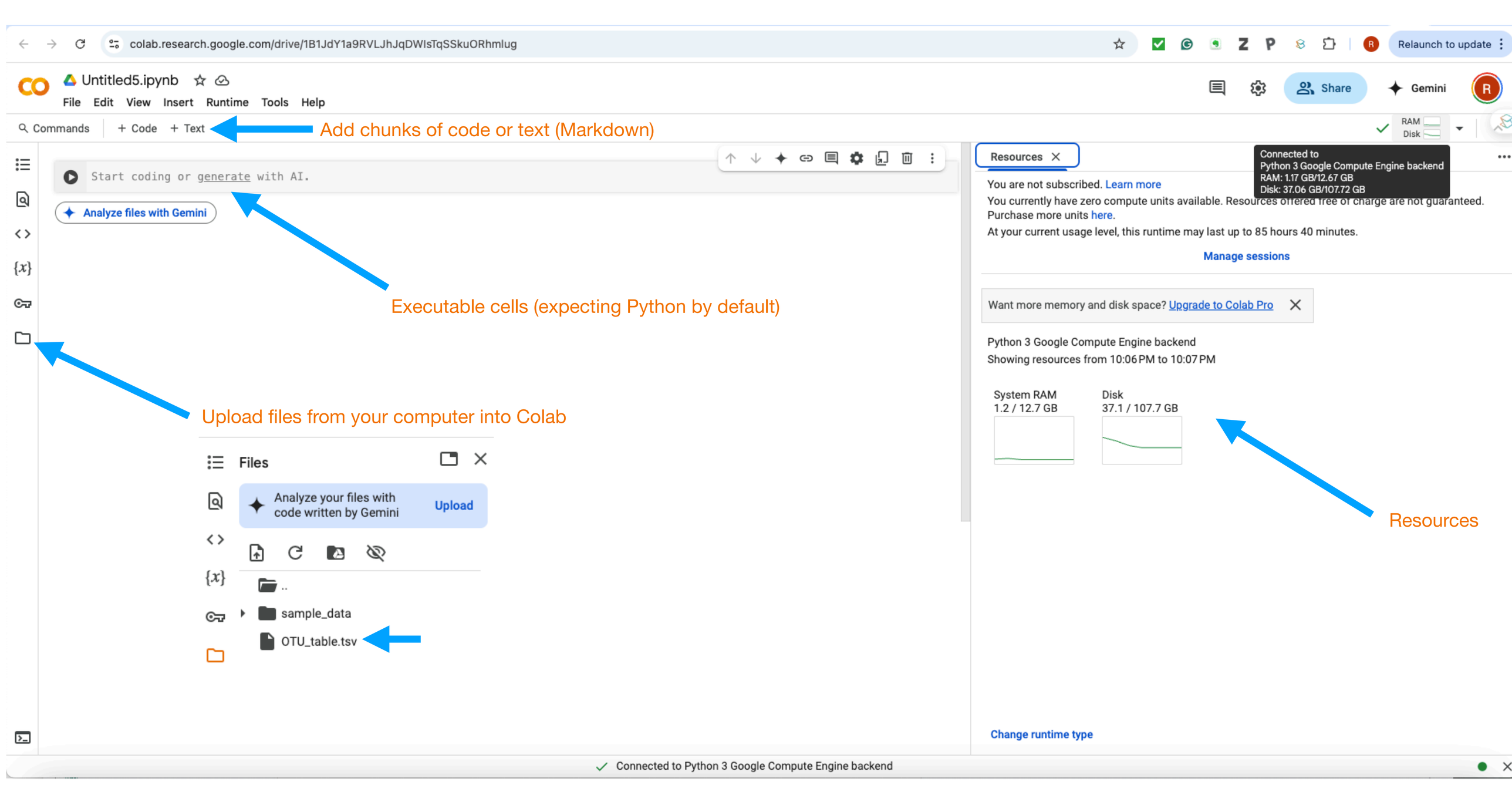
Explore complex use cases

- Use Gemini grounding capabilities to create a report on a company based on what the model can find on internet.
- Extract invoices and form data from PDF in a structured way.
- Create illustration based on a whole book using Gemini large context window and Imagen.

To learn more, check out the Gemini cookbook or visit the Gemini API documentation.

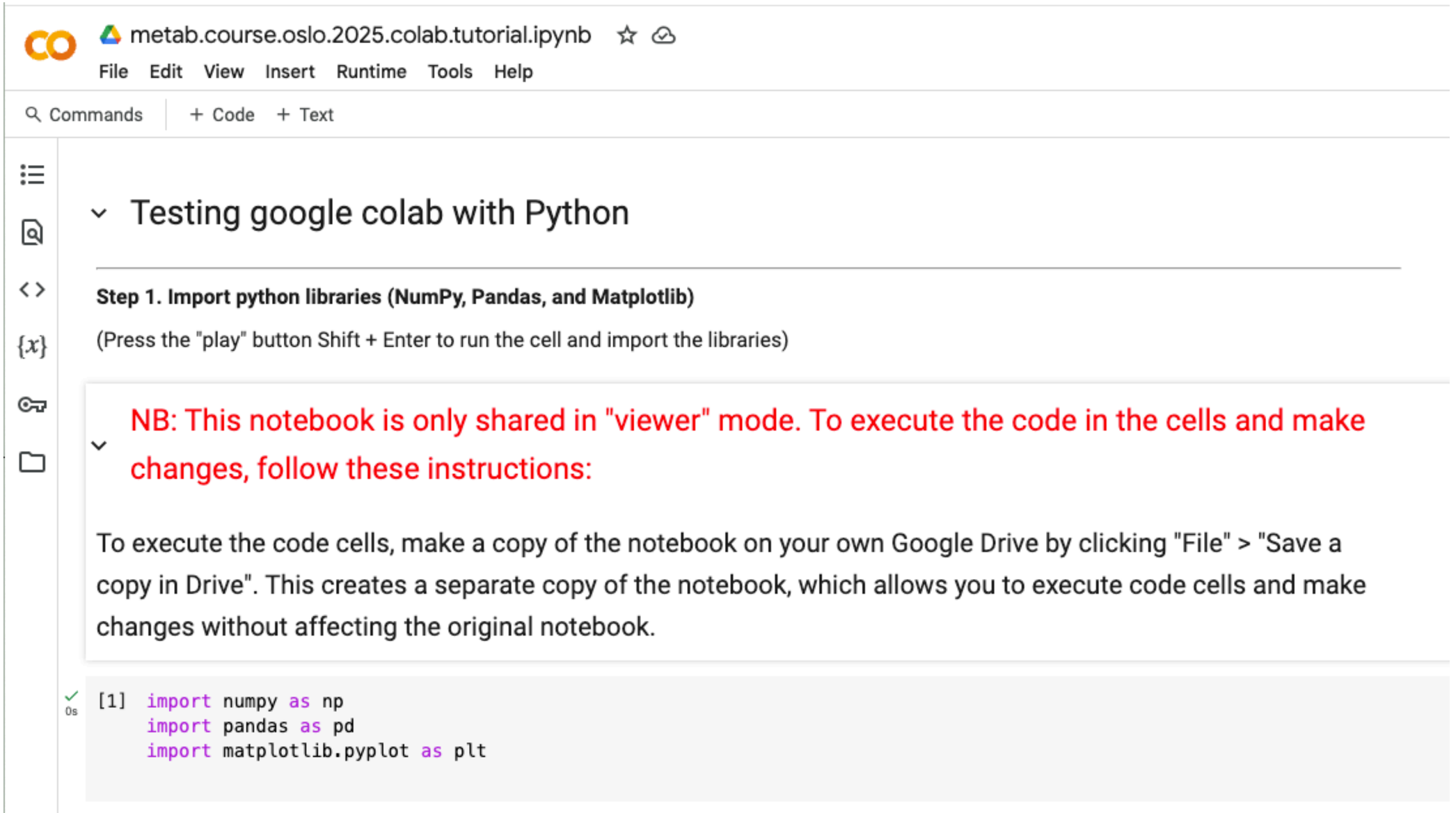
Colab now has AI features powered by Gemini. The video below provides information on how to use these features, whether you're new to Python, or a seasoned veteran.



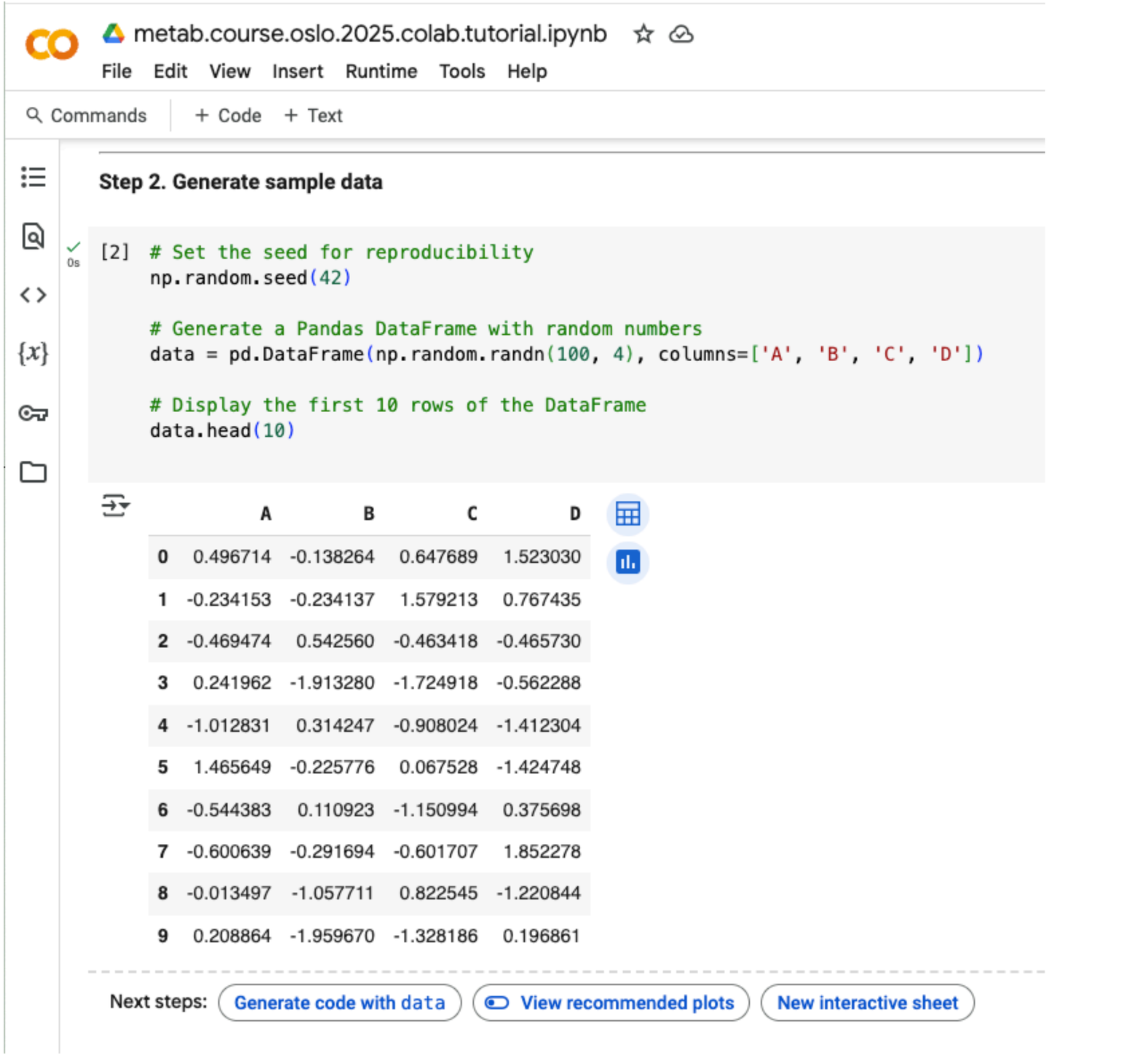

colab.research.google.com/drive/1B1JdY1a9RVLJhJqDWIsTqSSkuORhmlug
Relaunch to update
Untitled5.ipynb
File Edit View Insert Runtime Tools Help
Share
Gemini
Commands
+ Code
+ Text
Add chunks of code or text (Markdown)
RAM
Disk
Start coding or generate with AI.
Analyze files with Gemini
Executable cells (expecting Python by default)
Resources
Connected to
Python 3 Google Compute Engine backend
RAM: 1.17 GB/12.67 GB
Disk: 37.06 GB/107.72 GB
You are not subscribed. Learn more
You currently have zero compute units available. Resources offered free of charge are not guaranteed.
Purchase more units here.
At your current usage level, this runtime may last up to 85 hours 40 minutes.
Manage sessions
Want more memory and disk space? Upgrade to Colab Pro
Python 3 Google Compute Engine backend
Showing resources from 10:06 PM to 10:07 PM
System RAM
1.2 / 12.7 GB
Disk
37.1 / 107.7 GB
Upload files from your computer into Colab
Files
Analyze your files with code written by Gemini
Upload
..
sample_data
OTU_table.tsv
Resources
Change runtime type
Connected to Python 3 Google Compute Engine backend

Let’s run one example in Python

1. Load libraries



2. Generate random data



3. Summary stats

metab.course.oslo.2025.colab.tutorial.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text

Step 3: Calculate summary statistics

```
[ ]  # Calculate summary statistics for the dataset
     summary = data.describe()

     # Display the summary statistics
     summary
```

	A	B	C	D
count	100.000000	100.000000	100.000000	100.000000
mean	-0.009811	0.033746	0.022496	0.043764
std	0.868065	0.952234	1.044014	0.982240
min	-2.025143	-1.959670	-3.241267	-1.987569
25%	-0.716089	-0.564362	-0.616727	-0.727600
50%	-0.000248	-0.024646	0.068665	0.075219
75%	0.528231	0.547116	0.701519	0.778891
max	2.314659	3.852731	2.189803	2.720169

Next steps: Generate code with summary | View recommended plots | New interactive sheet

4. Data visualization

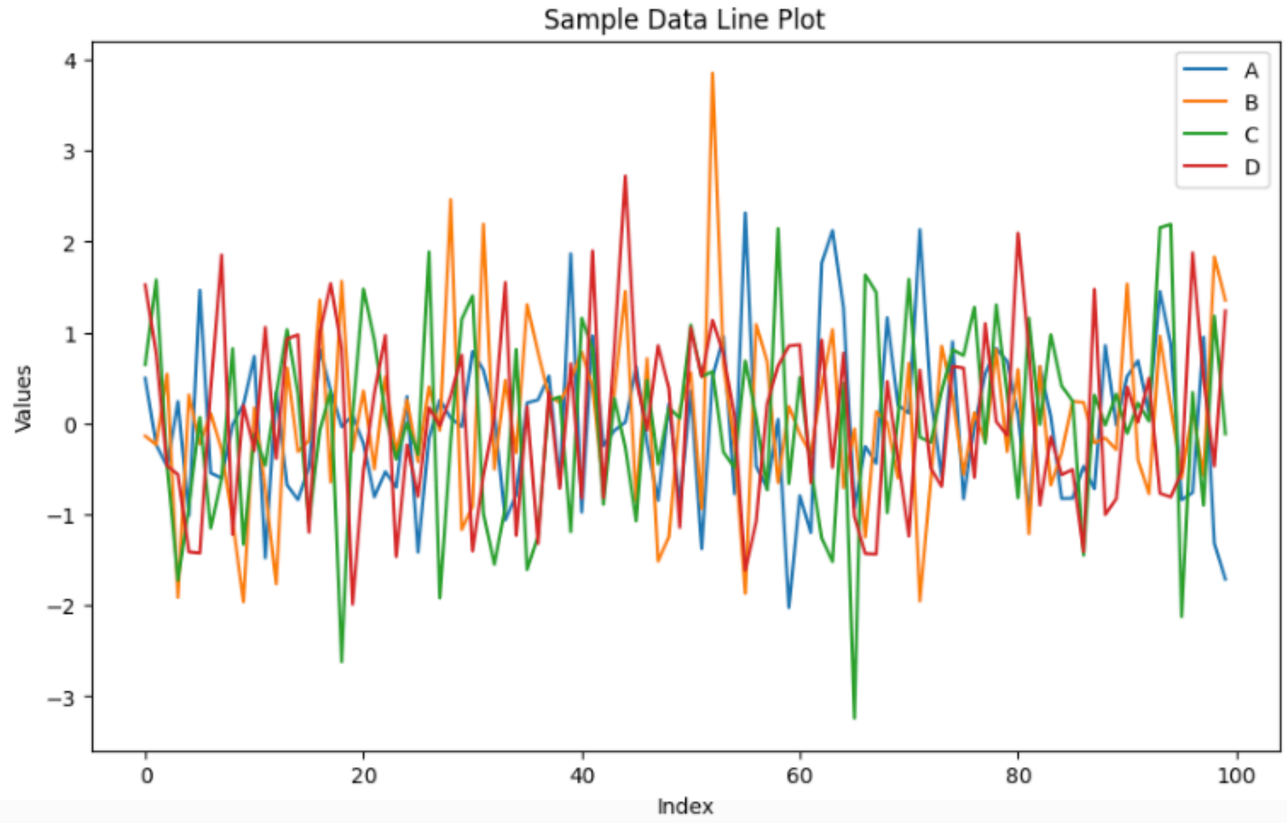
metab.course.oslo.2025.colab.tutorial.ipynb

File Edit View Insert Runtime Tools Help

Commands + Code + Text

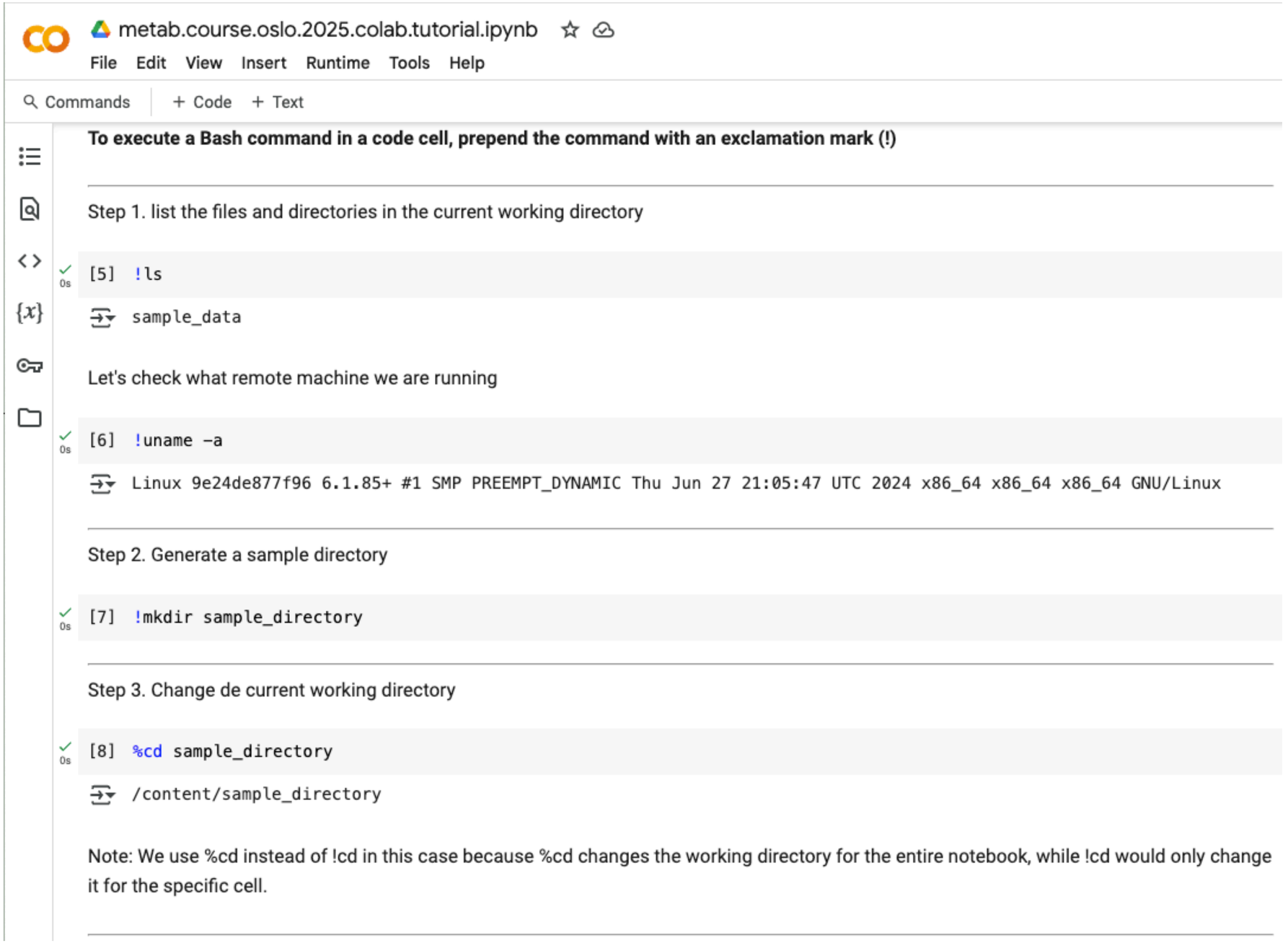
Step 4: Create a visualization

```
# Plot the dataset as a line plot
data.plot(kind='line', figsize=(10, 6))

# Add title and labels
plt.title('Sample Data Line Plot')
plt.xlabel('Index')
plt.ylabel('Values')

# Display the plot
plt.show()
```

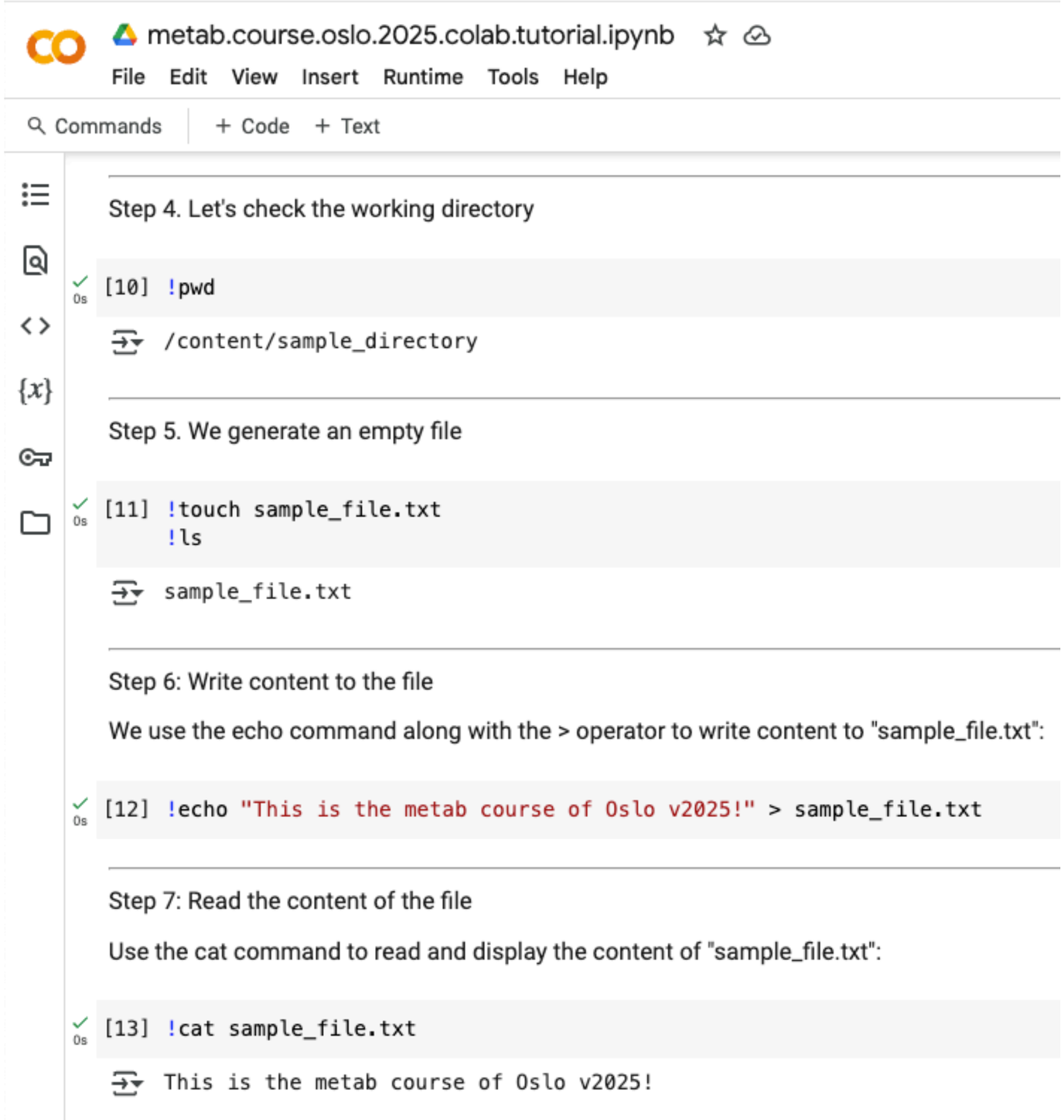


Running Bash

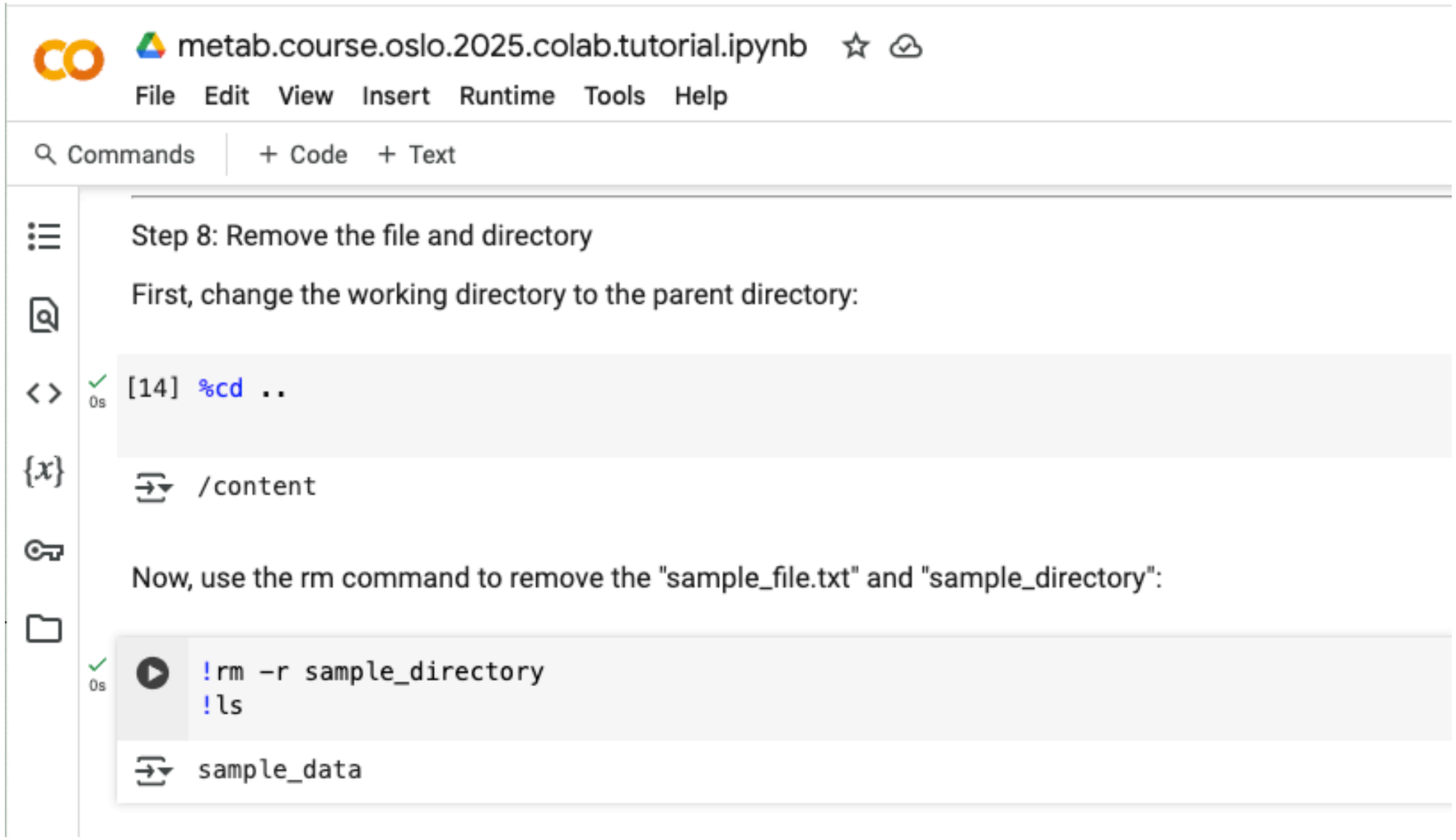
Prepend command with !



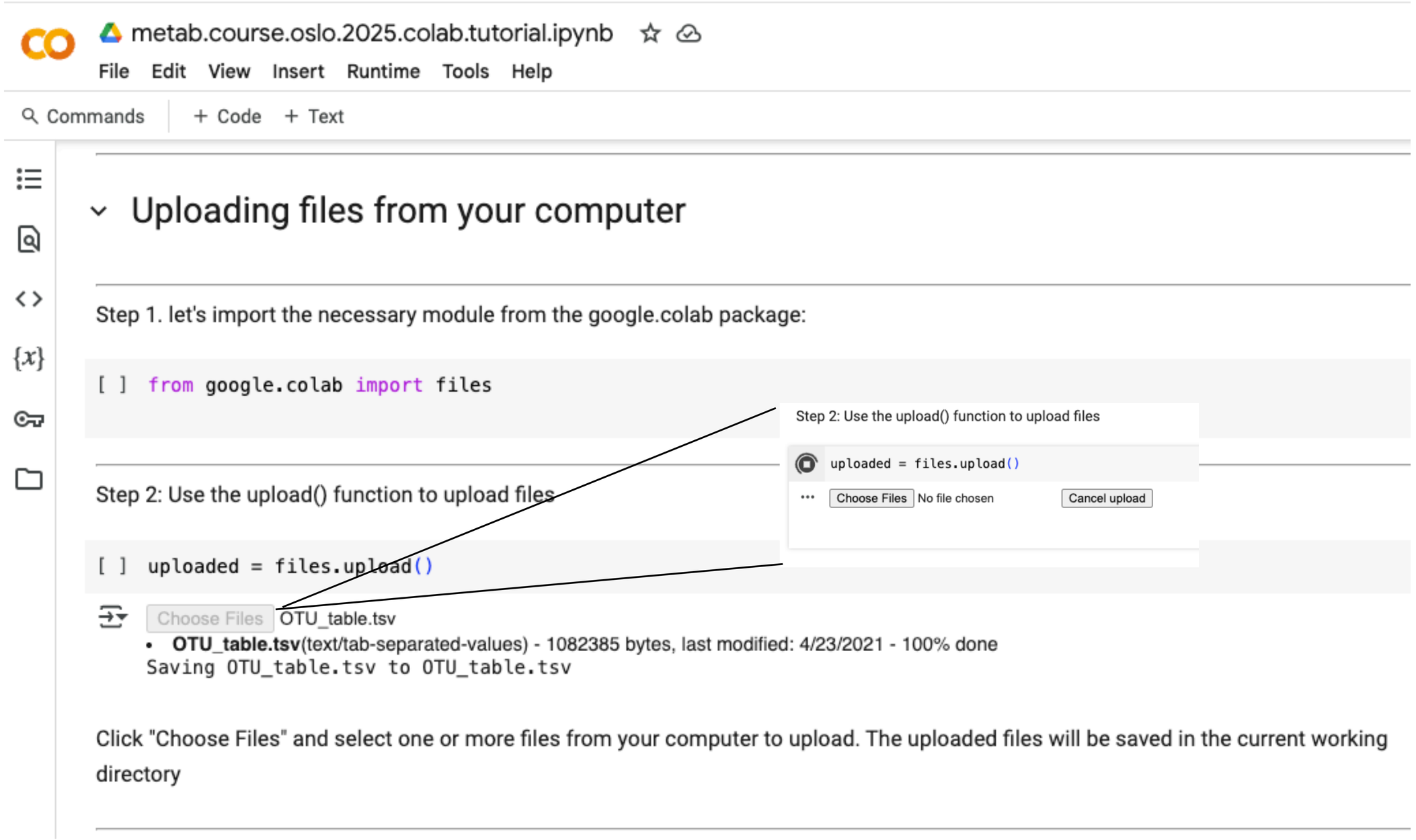
Running Bash



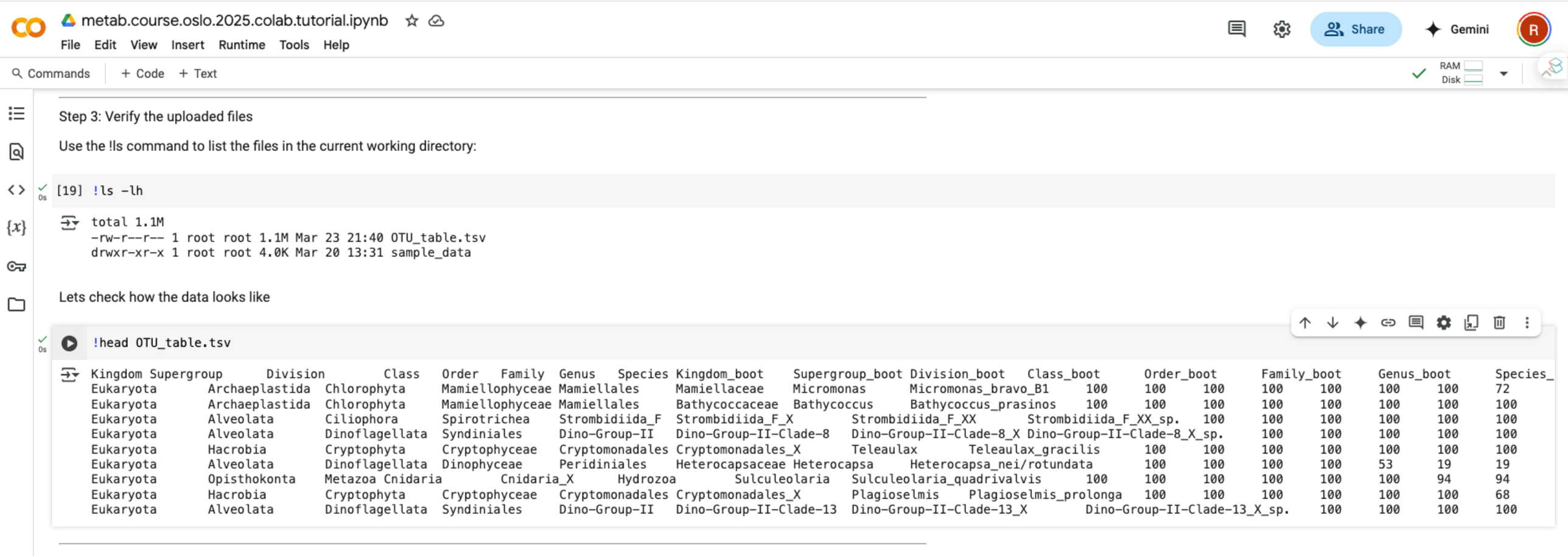
Running Bash



Uploading files from your computer into Colab



Uploading files from your computer into Colab



Tutorial

https://colab.research.google.com/drive/1ilsdx2b--mEQbgQQqfTPBDpvVB4BAQ0L?usp=sharing