

SAM2 Background Removal Tutorial

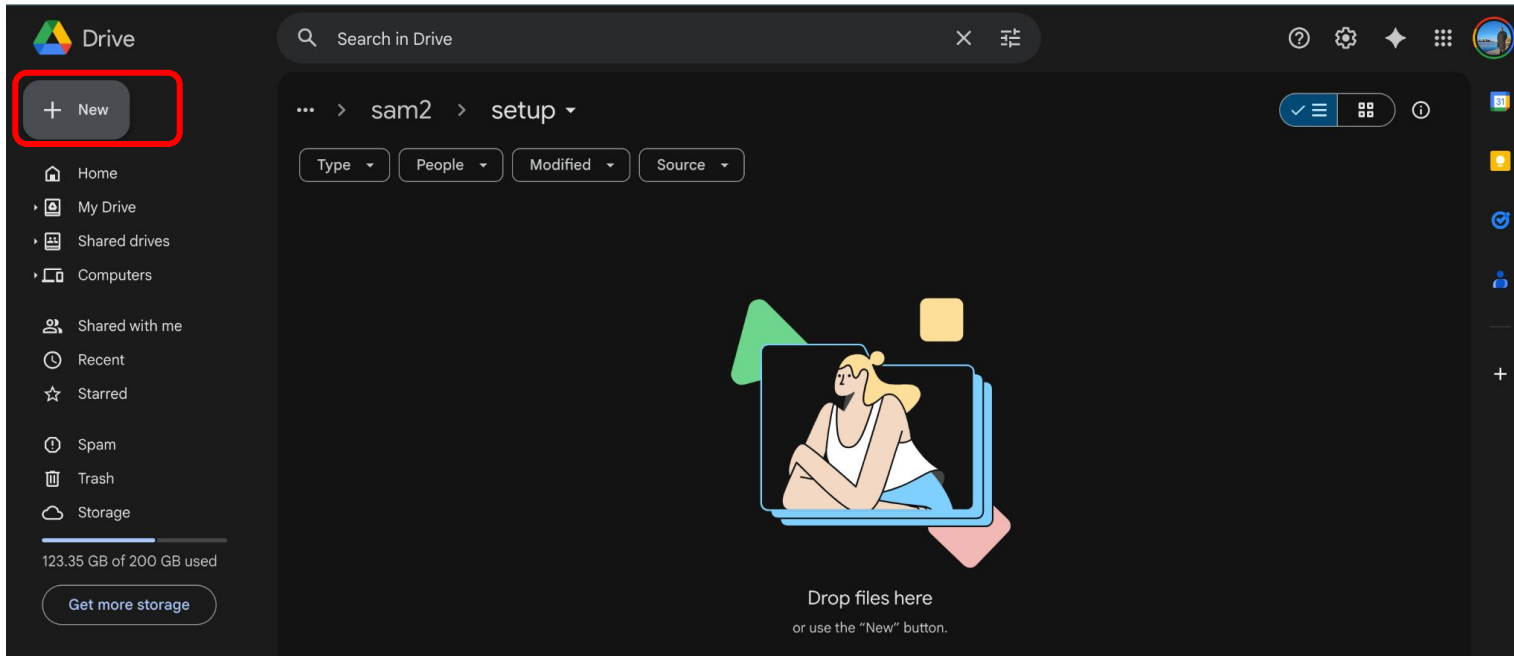
File: SAM2_bg_rm_HCI_ver.ipynb

Date: 07/30/2025

Name: Liang-Yu Ko

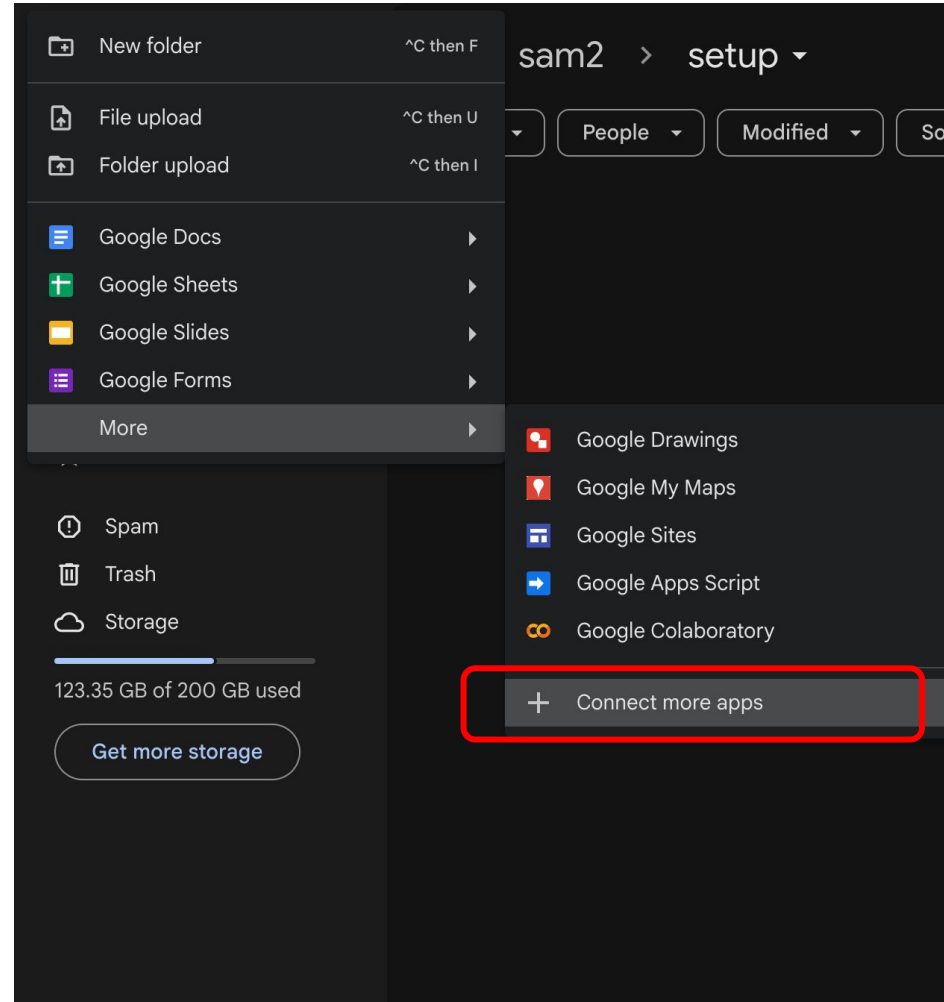
Setup Colab on google Drive

1. Go to [Google Drive](#) and log in with your Google Account
2. In the top-left corner of your Google Drive, click on the big + New button.



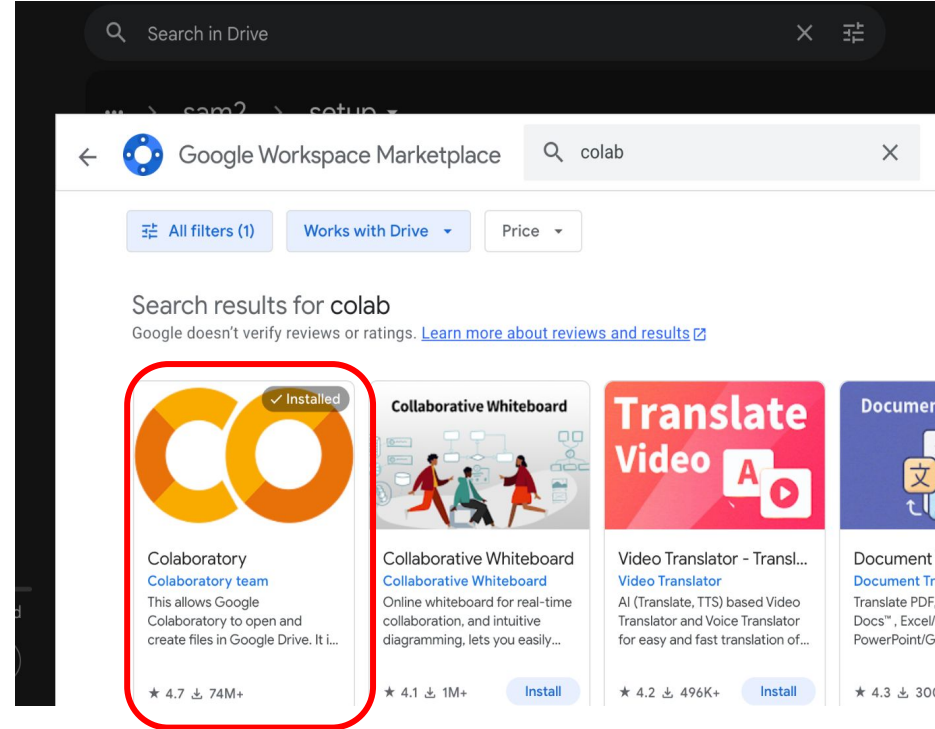
Setup Colab on Google Drive

1. A drop down menu will appear. Hover over **More**.
2. Look for Google Colaboratory in the expanded **More** menu.
 - a. If you DON'T see Google Colaboratory: click on **+ Connect more apps**.



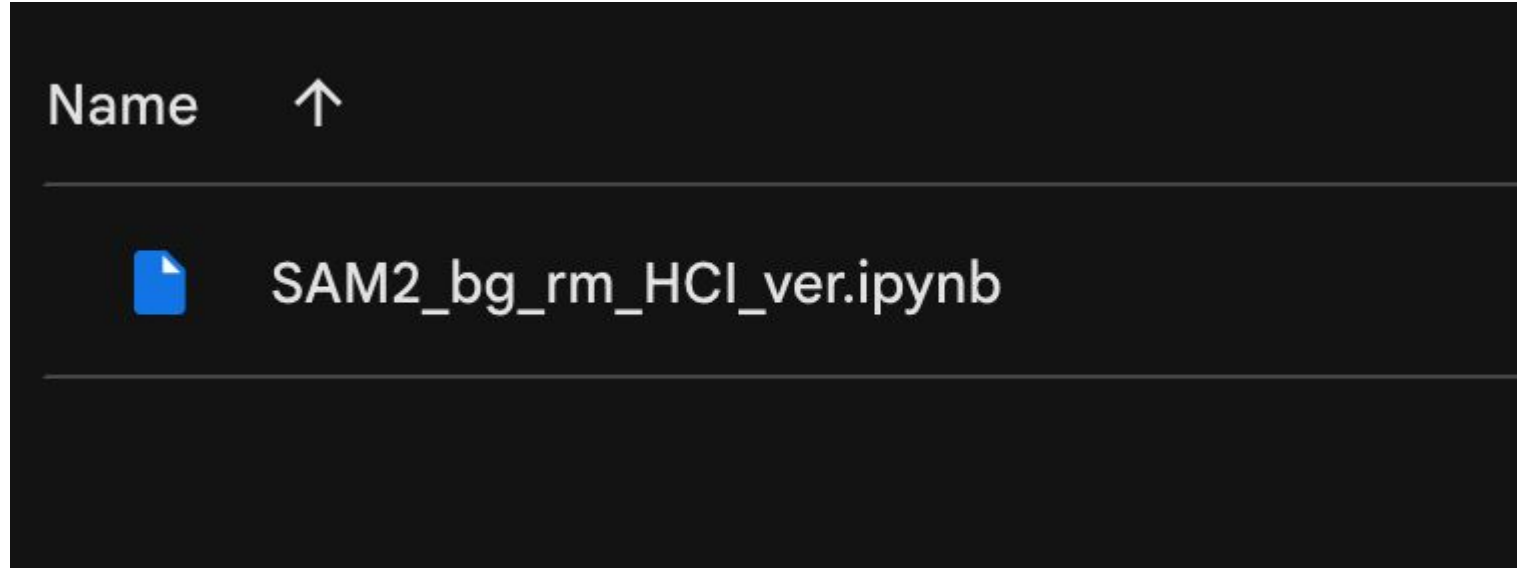
Setup Colab on Google Drive

1. A drop down menu will appear. Hover over **More**.
2. Look for Google Collaboratory in the expanded **More** menu.
 - a. If you DON'T see Google Collaboratory: click on **+ Connect more apps**.
 - b. A new window will pop up – this is the Google Workspace Marketplace.
 - c. In the search bar at the top of the Marketplace window, type **Colaboratory** (or **Colab**).
 - d. On the app's page, click the blue **Install** button.
 - e. Once installed, you can close the Marketplace window.



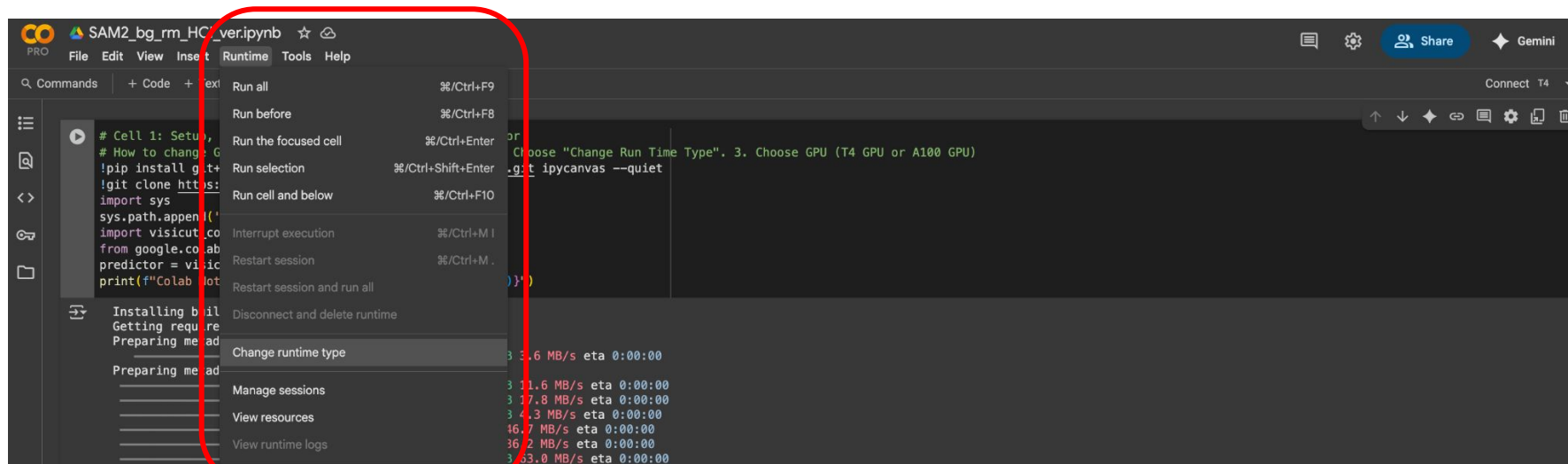
Setup Colab on Google Drive

1. Click and Open SAM2_bg_rm_HCI_ver.ipynb
2. Next Section



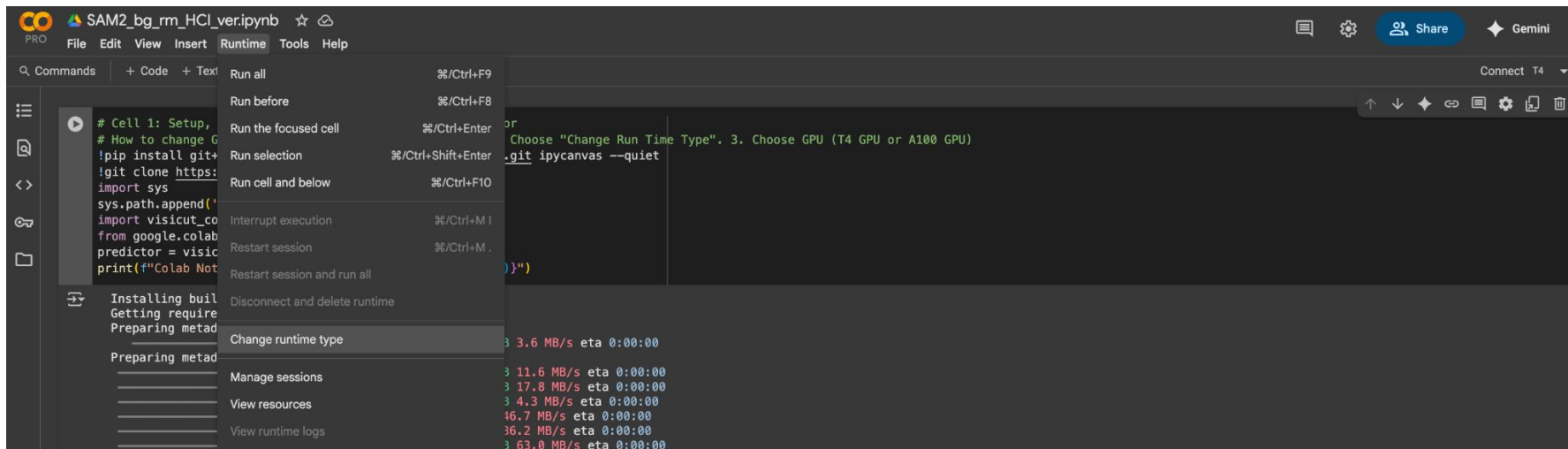
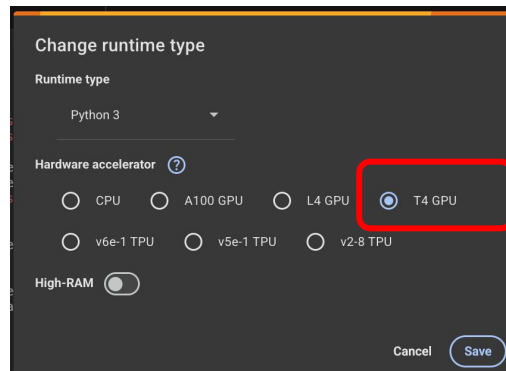
Initializing Colab Environment (with GPU)

1. **Locate the Runtime Menu:** In the top menu bar of your Colab notebook, click on **Runtime**.
2. **Change Runtime Type:** From the dropdown menu, select **Change runtime type**.
3. **Choose GPU:** A "Notebook settings" window will pop up.



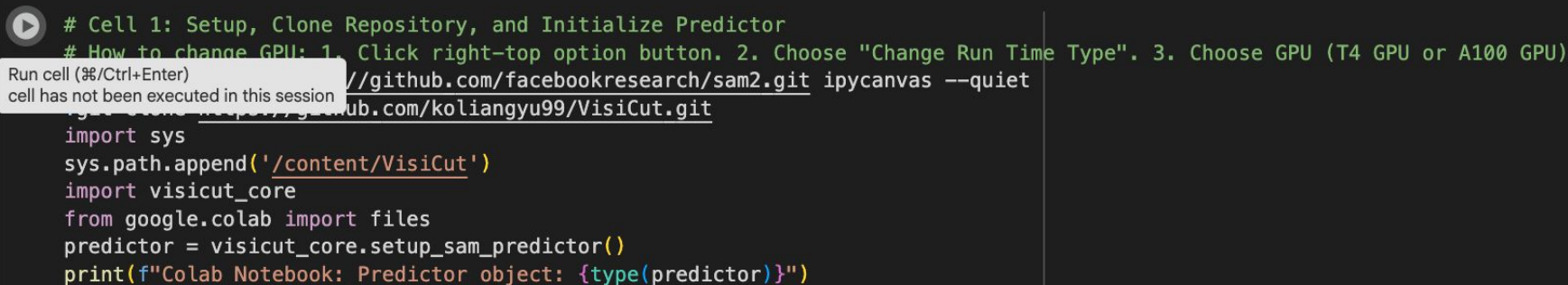
Initializing Colab Environment (with GPU)

1. **Locate the Runtime Menu:** In the top menu bar of your Colab notebook, click on **Runtime**.
2. **Change Runtime Type:** From the dropdown menu, select **Change runtime type**.
3. **Choose GPU:** A "Notebook settings" window will pop up.
 - a. Under the "Hardware accelerator" dropdown, select **GPU**.
 - b. Below that, ensure you see **T4 GPU** or **A100 GPU** (Colab will typically assign one automatically).
 - c. Click the blue **Save** button.



Running the SAM2 Background Removal Workflow

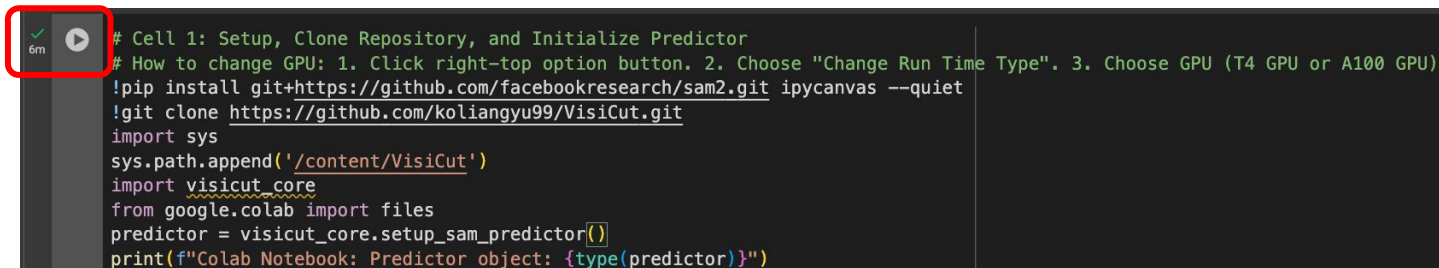
1. Run the Initial Setup Code (Cell 1)
 - a. Run the Cell: Click the "Play" icon (▶) to the left of the cell, or press Shift + Enter.
 - b. This cell will take a few minutes to run, especially for the first time in a new session, as it installs libraries and downloads the SAM-2 model. You'll see output indicating the progress.



Run cell (⌘/Ctrl+Enter)
cell has not been executed in this session

```
# Cell 1: Setup, Clone Repository, and Initialize Predictor
# How to change GPU: 1. Click right-top option button. 2. Choose "Change Run Time Type". 3. Choose GPU (T4 GPU or A100 GPU)
!pip install git+https://github.com/facebookresearch/sam2.git ipycanvas --quiet
!git clone https://github.com/koliangyu99/VisiCut.git
import sys
sys.path.append('/content/VisiCut')
import visicut_core
from google.colab import files
predictor = visicut_core.setup_sam_predictor()
print(f"Colab Notebook: Predictor object: {type(predictor)}")
```

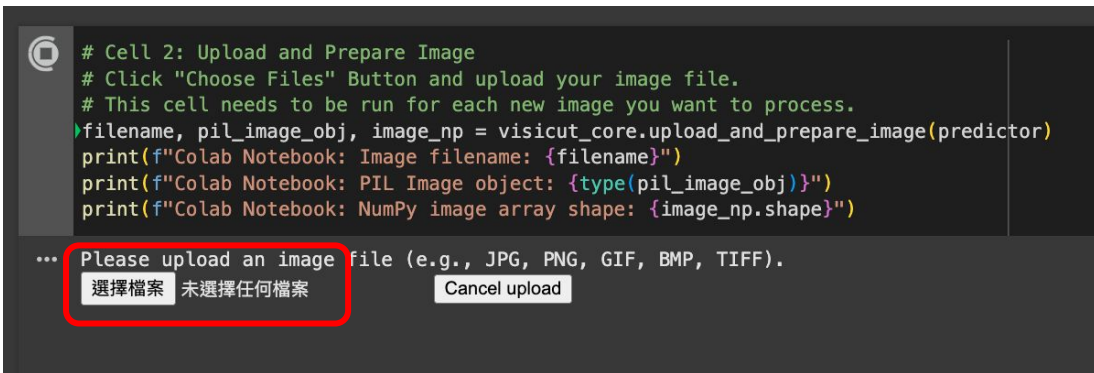
If cell finished, you'll see a green check symbol



```
# Cell 1: Setup, Clone Repository, and Initialize Predictor
# How to change GPU: 1. Click right-top option button. 2. Choose "Change Run Time Type". 3. Choose GPU (T4 GPU or A100 GPU)
!pip install git+https://github.com/facebookresearch/sam2.git ipycanvas --quiet
!git clone https://github.com/koliangyu99/VisiCut.git
import sys
sys.path.append('/content/VisiCut')
import visicut_core
from google.colab import files
predictor = visicut_core.setup_sam_predictor()
print(f"Colab Notebook: Predictor object: {type(predictor)}")
```


Running the SAM2 Background Removal Workflow

1. Upload Your Image (Cell 2)
 - a. Run the Cell: Click the "Play" icon (▶) or press Shift + Enter.
 - b. Upload Prompt: A "Choose Files" button will appear in the cell's output. Click it.
 - c. Select Image: Navigate to your desired image file on your computer (e.g., a JPG or PNG of a chair, a dog, etc.) and select it for upload.

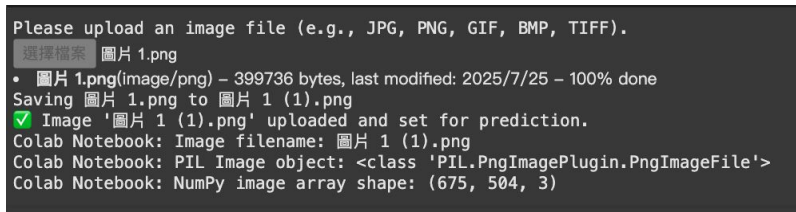


The screenshot shows a Jupyter Notebook cell with the following code:

```
# Cell 2: Upload and Prepare Image
# Click "Choose Files" Button and upload your image file.
# This cell needs to be run for each new image you want to process.
filename, pil_image_obj, image_np = visicut_core.upload_and_prepare_image(predictor)
print(f"Colab Notebook: Image filename: {filename}")
print(f"Colab Notebook: PIL Image object: {type(pil_image_obj)}")
print(f"Colab Notebook: NumPy image array shape: {image_np.shape}")
```

Below the code, there is a message: "Please upload an image file (e.g., JPG, PNG, GIF, BMP, TIFF)." and a file selection dialog with the text "選擇檔案" (Choose file) and "未選擇任何檔案" (No file selected). The "選擇檔案" button is highlighted with a red box.

Once uploaded, you'll see messages confirming the file upload

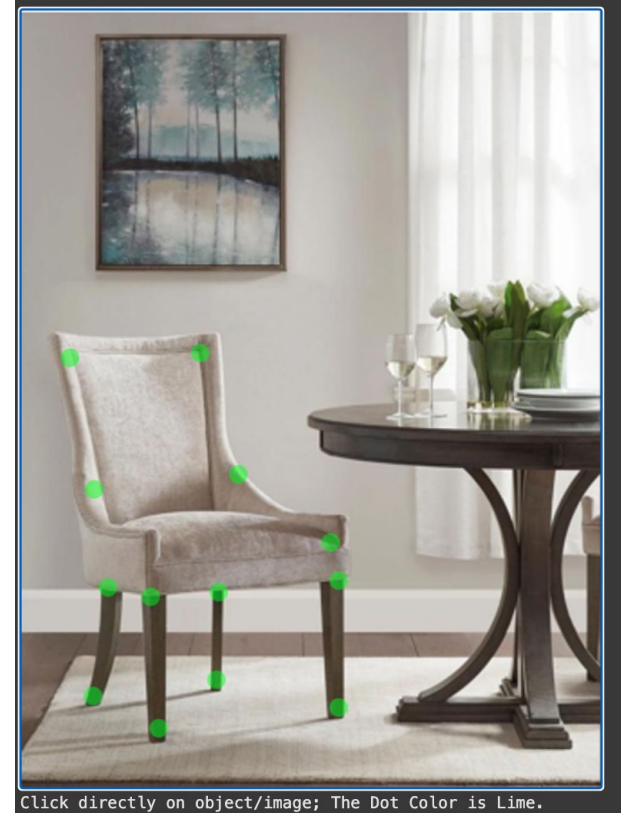


The screenshot shows the output of the Jupyter Notebook cell, displaying the following messages:

```
Please upload an image file (e.g., JPG, PNG, GIF, BMP, TIFF).
選擇檔案 圖片 1.png
• 圖片 1.png(image/png) – 399736 bytes, last modified: 2025/7/25 – 100% done
Saving 圖片 1.png to 圖片 1 (1).png
✅ Image '圖片 1 (1).png' uploaded and set for prediction.
Colab Notebook: Image filename: 圖片 1 (1).png
Colab Notebook: PIL Image object: <class 'PIL.PngImagePlugin.PngImageFile'>
Colab Notebook: NumPy image array shape: (675, 504, 3)
```

Running the SAM2 Background Removal Workflow

1. Interact with the Canvas (Cell 3)
 - a. Run the Cell: Click the "Play" icon (▶) or press Shift + Enter.
 - b. An interactive canvas displaying your uploaded image will appear in the cell's output.
 - c. Click directly on the object(s) you want to segment. A small green dot will appear for each click. You can click multiple times to refine your selection.



Important: Do not re-run Cell 3 after you've started clicking, as it will reset your points!

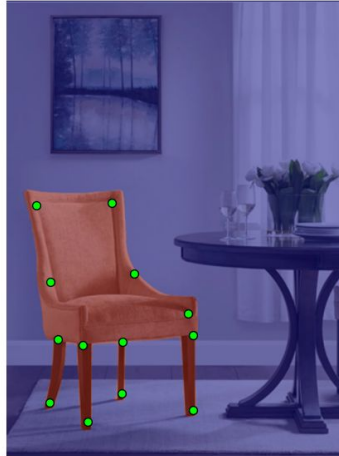
Running the SAM2 Background Removal Workflow

1. Run SAM-2 and Visualize Results (Cell 4)
 - a. Run the Cell: Click the "Play" icon (▶) or press Shift + Enter.
 - b. You'll see "Predicting mask with X points..." message.
 - c. A Matplotlib plot displaying three images side-by-side:
 - i. Original Image + Points
 - ii. Mask Overlay
 - iii. Final Cutout (Flattened)
 - d. Below the plot, the final flattened cutout image will be displayed again for easy viewing.

1. Original Image + Points



2. Mask Overlay



3. Final Cutout (Flattened)



Running the SAM2 Background Removal Workflow

1. Save and Direct Download (Cell 5)
 - a. You'll see messages like "✅ Saved cutout to Colab files as sam2_name.png".
 - b. Your web browser will prompt you to download sam2_name.png (or it might download automatically depending on your browser settings).

▶ # Cell 5: Saving and Direct Download of Cutout Image

This cell saves the cutout to your Colab environment and initiates a download to your local machine.
visicut_core.save_cutout(filename, result_pil_image)

➡ ✅ Saved cutout to Colab files as sam2_圖片 1.png

⬇️ Initiating download for sam2_圖片 1.png...