

**Subject**

# **Computer Vision**

**Activities in class**

**Unit I**

**Digital Image Fundamentals**

**Session 01**

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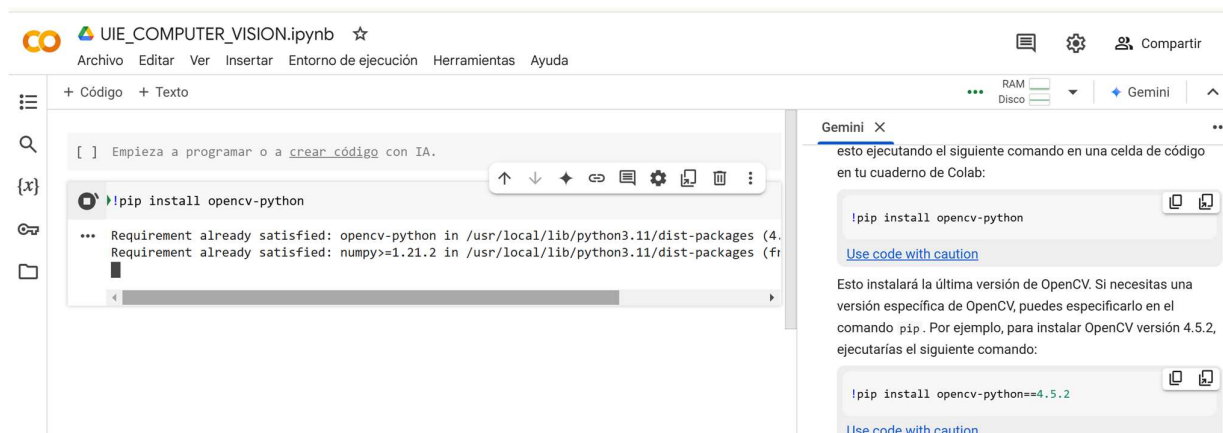
## SETTING UP GOOGLE COLAB ENVIROMENT

Before we proceed, let's make sure we have the necessary libraries installed. Google Colab comes pre-installed with most of the common libraries, but we'll still check and install the required ones:

**!pip install opencv-python**

**!pip install pillow**

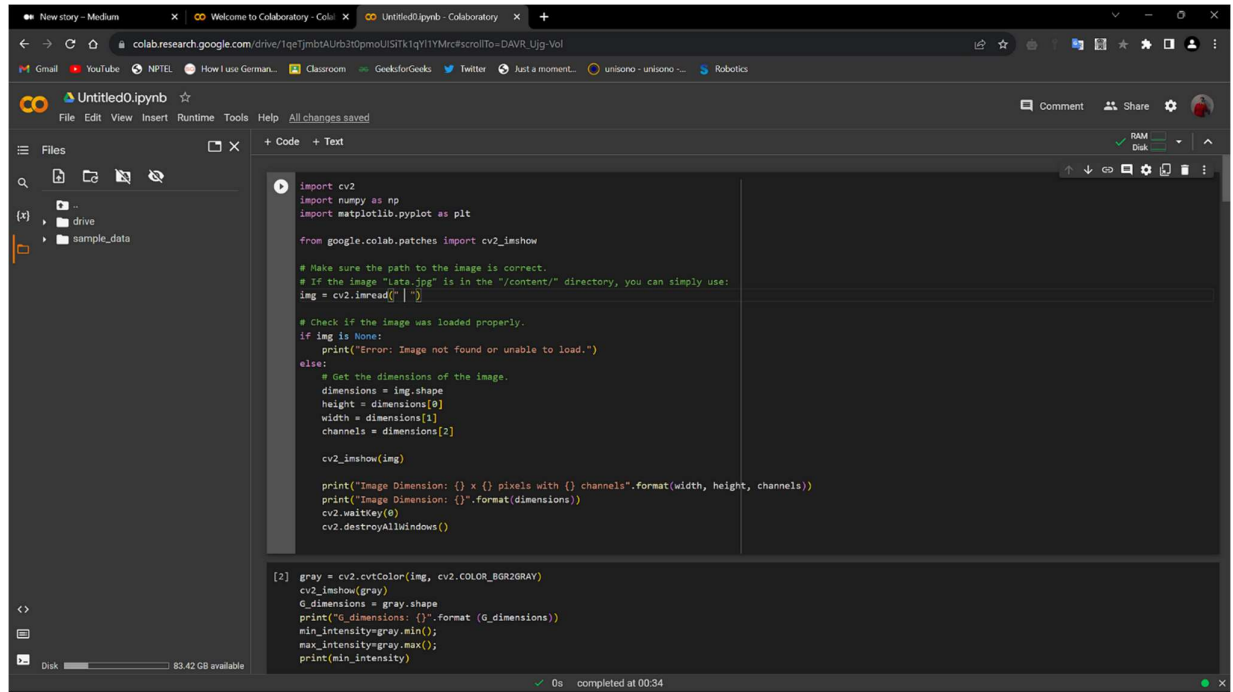
**!pip install matplotlib**



## Uploading Images to Google Colab

Before we begin loading and reading images, we need to upload the image files to our Google Colab environment. To upload images, follow these steps:

1. Click the "Files" icon on the left sidebar.



The screenshot shows the Google Colaboratory interface with a Jupyter Notebook titled 'Untitled0.ipynb'. The code in the notebook is as follows:

```
import cv2
import numpy as np
import matplotlib.pyplot as plt

from google.colab.patches import cv2_imshow

# Make sure the path to the image is correct.
# If the image "lata.jpg" is in the "/content/" directory, you can simply use:
img = cv2.imread("/content/lata.jpg")

# Check if the image was loaded properly.
if img is None:
    print("Error: Image not found or unable to load.")
else:
    # Get the dimensions of the image.
    dimensions = img.shape
    height = dimensions[0]
    width = dimensions[1]
    channels = dimensions[2]

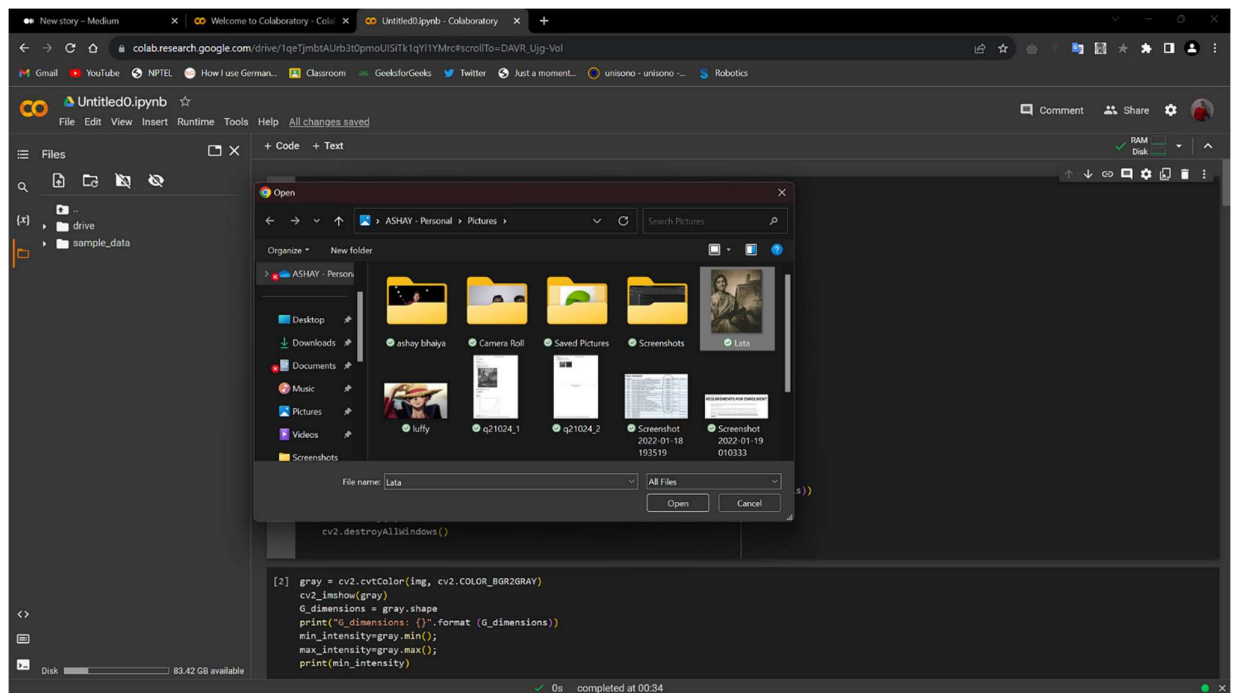
    cv2_imshow(img)

    print("Image Dimension: {} x {} pixels with {} channels".format(width, height, channels))
    print("Image Dimension: {}".format(dimensions))
    cv2.waitKey(0)
    cv2.destroyAllWindows()

[2] gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    cv2_imshow(gray)
    G_dimensions = gray.shape
    print("G_dimensions: {}".format(G_dimensions))
    min_intensity=gray.min();
    max_intensity=gray.max();
    print(min_intensity)
```

The interface shows the file explorer on the left with 'drive' and 'sample\_data' folders. The status bar at the bottom indicates '0s completed at 00:34'.

2. Click the “Upload” button and select the image files you want to use.

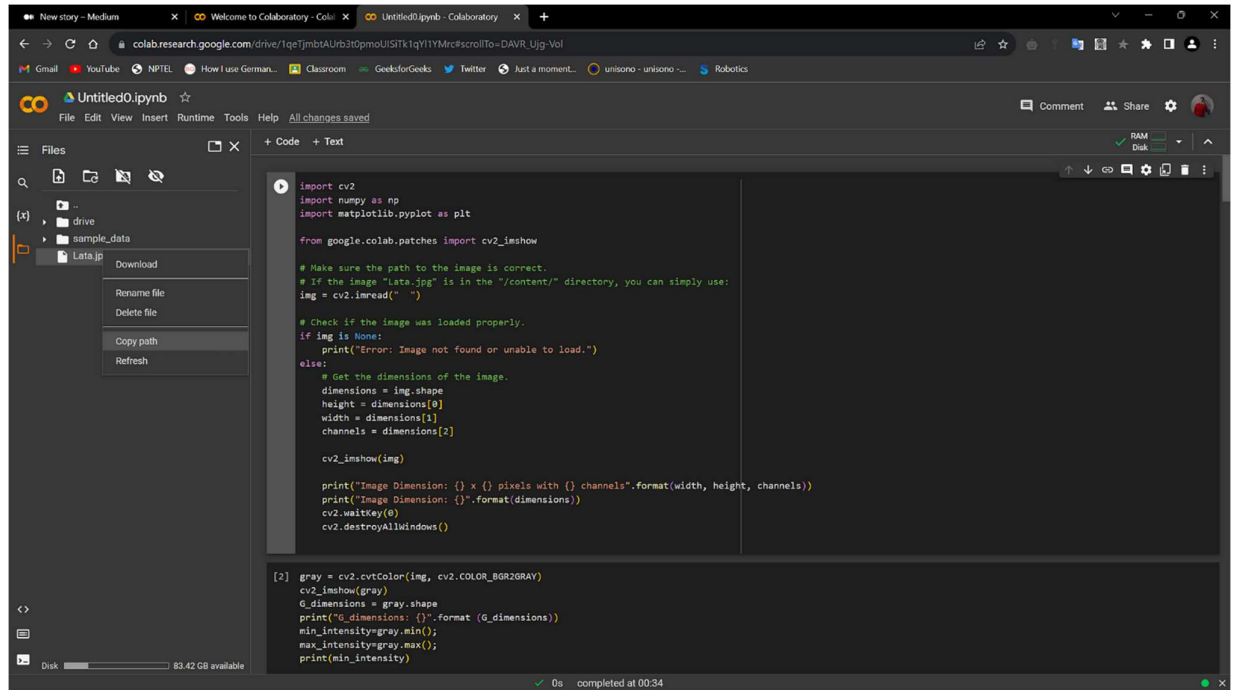


The screenshot shows the same Google Colaboratory interface, but with a file upload dialog box open. The dialog is titled 'Open' and shows the contents of the 'ASHAY - Personal > Pictures' folder. The file 'lata.jpg' is selected. The code in the notebook is the same as in the previous screenshot, but the execution has moved to the second cell, which is highlighted in blue.

```
cv2.destroyAllWindows()

[2] gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    cv2_imshow(gray)
    G_dimensions = gray.shape
    print("G_dimensions: {}".format(G_dimensions))
    min_intensity=gray.min();
    max_intensity=gray.max();
    print(min_intensity)
```

The status bar at the bottom still indicates '0s completed at 00:34'.



Copy the Path for further references

## Loading Images with OpenCV

Now that we have our images uploaded:

- a. For Simplifying Loading the Image, the Basic command using OpenCV is:

```

import cv2
from google.colab.patches import cv2_imshow
# Open the image.
img = cv2.imread("/content/Lata.jpg")
cv2_imshow(img)
  
```

- b. Loading and reading them using OpenCV:

```
import cv2
import numpy as np
import matplotlib.pyplot as plt

from google.colab.patches import cv2_imshow

# Make sure the path to the image is correct.
# If the image "Lata.jpg" is in the "/content/" directory, you can simply use:
img = cv2.imread("/content/Lata.jpg")

# Check if the image was loaded properly.
if img is None:
    print("Error: Image not found or unable to load.")
else:
    # Get the dimensions of the image.
    dimensions = img.shape
    height = dimensions[0]
    width = dimensions[1]
    channels = dimensions[2]

    cv2_imshow(img)

    print("Image Dimension: {} x {} pixels with {} channels".format(width, height, channels))
    print("Image Dimension: {}".format(dimensions))
    cv2.waitKey(0)
    cv2.destroyAllWindows()
```

## Resources:

<https://medium.com/@ingaleashay/loading-and-displaying-images-in-google-colab-a-guide-with-opencv-pil-and-matplotlib-d13bf5b8fe6b>