# OpenCV Lab Task Report

## 1. Load and Display an Image

This code loads an image from the specified path and displays it in a window.

It uses `cv2.imread()` to read the image and `cv2.imshow()` to display it.

The display window remains open until a key is pressed using `cv2.waitKey(0)`.

Key Functions:

- cv2.imread(): Reads the image.
- cv2.imshow(): Displays the image.
- cv2.waitKey(0): Waits for a key event.
- cv2.destroyAllWindows(): Closes all OpenCV windows.

## 2. Capture Video from Webcam

This code captures live video from the default webcam using `cv2.VideoCapture(0)`.

The video feed is displayed in real-time. Pressing the 'q' key exits the loop and closes the window.

Key Functions:

- cap.read(): Reads a frame from the webcam.
- cv2.imshow(): Displays each frame.
- cv2.waitKey(1): Waits briefly between frames.
- cap.release(): Releases the camera.
- cv2.destroyAllWindows(): Closes the video window.

## 3. Read and Save an Image

This script reads an image and saves it to a new file.

It demonstrates how to use OpenCV to manipulate and store image data.

Key Functions:

- cv2.imread(): Loads the image.
- cv2.imwrite(): Saves the image to a specified path.

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## 4. Drawing Shapes on an Image

This code creates a blank black image and draws a line, rectangle, and circle on it.

It shows how OpenCV can be used for simple graphics operations.

Key Functions:

- np.zeros(): Creates a black image.
- cv2.line(): Draws a line.
- cv2.rectangle(): Draws a rectangle.
- cv2.circle(): Draws a circle.
- cv2.imshow(): Displays the drawing.