# Instructions on how to run the software

This code performs emotion detection on images and a real-time webcam video stream using the DeepFace library and OpenCV.

Here is a step-by-step explanation of how the code executes:

**Import necessary libraries:**

cv2: OpenCV library for image and video processing.

DeepFace: A deep learning facial analysis library.

matplotlib.pyplot: Library for visualizing images.

**Read and display an image:**

cv2.imread('happy_boy.jpeg'): Reads the image file 'happy_boy.jpeg'.

plt.imshow(img): Displays the image using Matplotlib.

Analyze emotions in the image:

**DeepFace.analyze(img):**

Analyzes the emotions in the image using DeepFace library.

predictions: Stores the results of emotion analysis.

Extract dominant emotions:

**desired_emotions:**

Extracts the dominant emotions from the predictions.

Detect and draw rectangles around faces in the image:

**faceCascade:**

Loads the Haar cascade classifier for face detection.

gray: Converts the image to grayscale.

faces = faceCascade.detectMultiScale(gray, 1.1, 4): Detects faces in the image.

cv2.rectangle(img, (x, y), (x+w, y+h), (0, 255, 0), 2): Draws rectangles around the detected faces.

Display the image with emotions and rectangles:

plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB)): Displays the modified image using Matplotlib.

Repeat the above steps for a different image:

Load 'fear_women.jpg'.

Display the image.

Analyze emotions.

Draw rectangles around faces.

Display the image with emotions and rectangles.

Real-time emotion detection using webcam:

Initialize the video capture using cap=cv2.VideoCapture(1) (tries to use the second camera) and fallback to cap=cv2.VideoCapture(0) (tries to use the default camera).

Enter a loop to continuously read frames from the video capture.

Analyze emotions in each frame using result = DeepFace.analyze(frame, actions=['emotion'], enforce_detection=False).

Detect and draw rectangles around faces in the frame.

Display the frame with the dominant emotion.

Break the loop if 'q' key is pressed.

Release the video capture and close all windows.