Aim:

To write a python program using OpenCV to capture the image from the web camera and do the following image manipulations.
i) Write the frame as JPG
ii) Display the video
iii) Display the video by resizing the window
iv) Rotate and display the video

Software Used

Anaconda - Python 3.7

Algorithm

Step 1:
Use cv2.VideoCapture(0) to access web camera.
Step 2:
Use cv2.imread to read the video or image.
Step 3:
Use cv2.imwrite to save the image.
Step 4:
Use cv2.imshow to show the video.
Step 5:
End the program and close the output video window by pressing 'q'.

Program:

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i) Write the frame as JPG file

```
import cv2
viedoCaptureObject=cv2.VideoCapture(0)

ret,frame=viedoCaptureObject.read()
cv2.imwrite("webcam_img.jpg",frame)

viedoCaptureObject.release()
cv2.destroyAllWindows()
```

ii) Display the video

```
import numpy as np
import cv2

cap = cv2.VideoCapture(0)
ret, frame = cap.read()

cv2.imshow('captured_frame', frame)

cv2.waitKey(10000)


cap.release()
cv2.destroyAllWindows()
```

iii) Display the video by resizing the window

```
import numpy as np
import cv2
cap=cv2.VideoCapture(0)

ret,frame=cap.read()
width=int(cap.get(3))
height=int(cap.get(4))
image=np.zeros(frame.shape,np.uint8)
smaller_frame=cv2.resize(frame,(0,0),fx=0.5,fy=0.5)
image[:height//2, :width//2]=smaller_frame
image[height//2:, :width//2]=smaller_frame
image[:height//2, width//2:]=smaller_frame
image[height//2:, width//2:]=smaller_frame

cv2.imshow('212222240110_Thiyagarajan',image)

cv2.waitKey(5000)
```

```
image_dict = {'captured_image1': image}
cv2.imwrite('captured_image1.jpg', image)

cap.release()
cv2.destroyAllWindows()
```

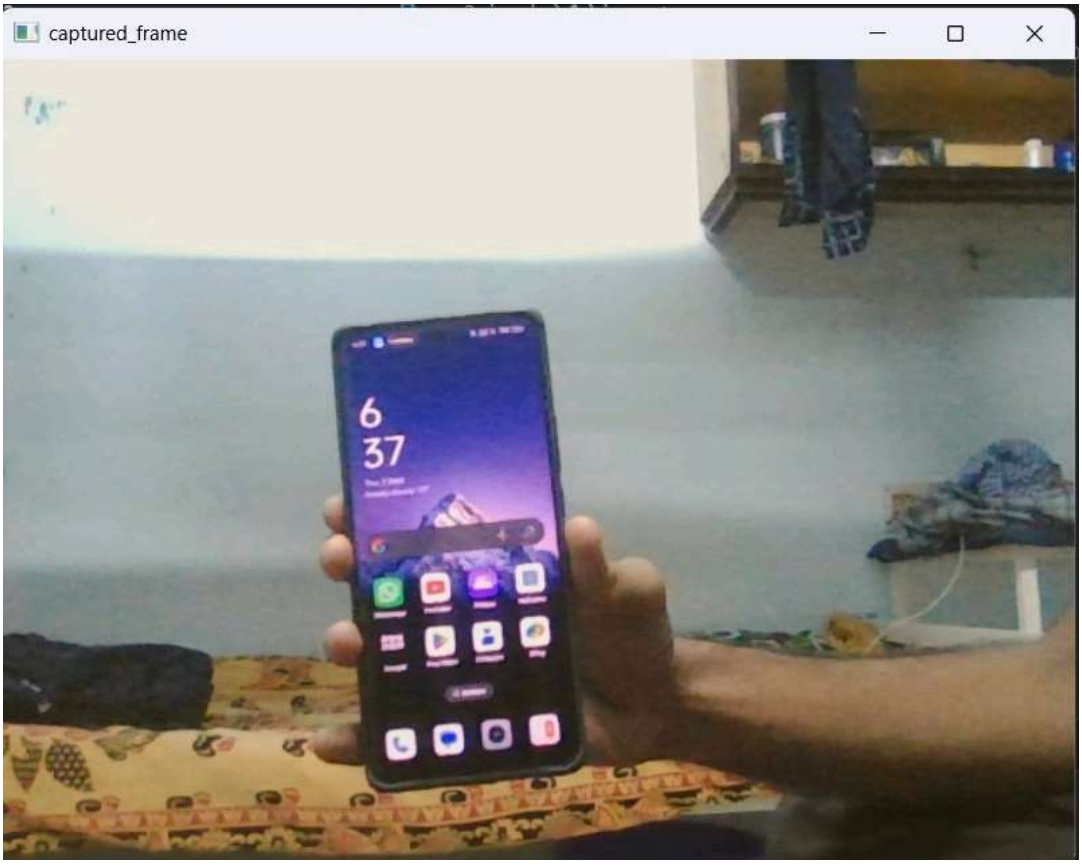
iv) Rotate and display the video

```
import numpy as np
import cv2
cap=cv2.VideoCapture(0)

ret,frame=cap.read()
width=int(cap.get(3))
height=int(cap.get(4))
image=np.zeros(frame.shape,np.uint8)
smaller_frame=cv2.resize(frame,(0,0),fx=0.5,fy=0.5)
image[:height//2, :width//2]=cv2.rotate(smaller_frame,cv2.ROTATE_180)
image[height//2:, :width//2]=smaller_frame
image[:height//2, width//2:]=cv2.rotate(smaller_frame,cv2.ROTATE_180)
image[height//2:, width//2:]=smaller_frame

cv2.imshow('212222240110',image)

cv2.waitKey(5000)

image_dict = {'captured_image2': image}
cv2.imwrite('captured_image2.jpg', image)

cap.release()
cv2.destroyAllWindows()
```

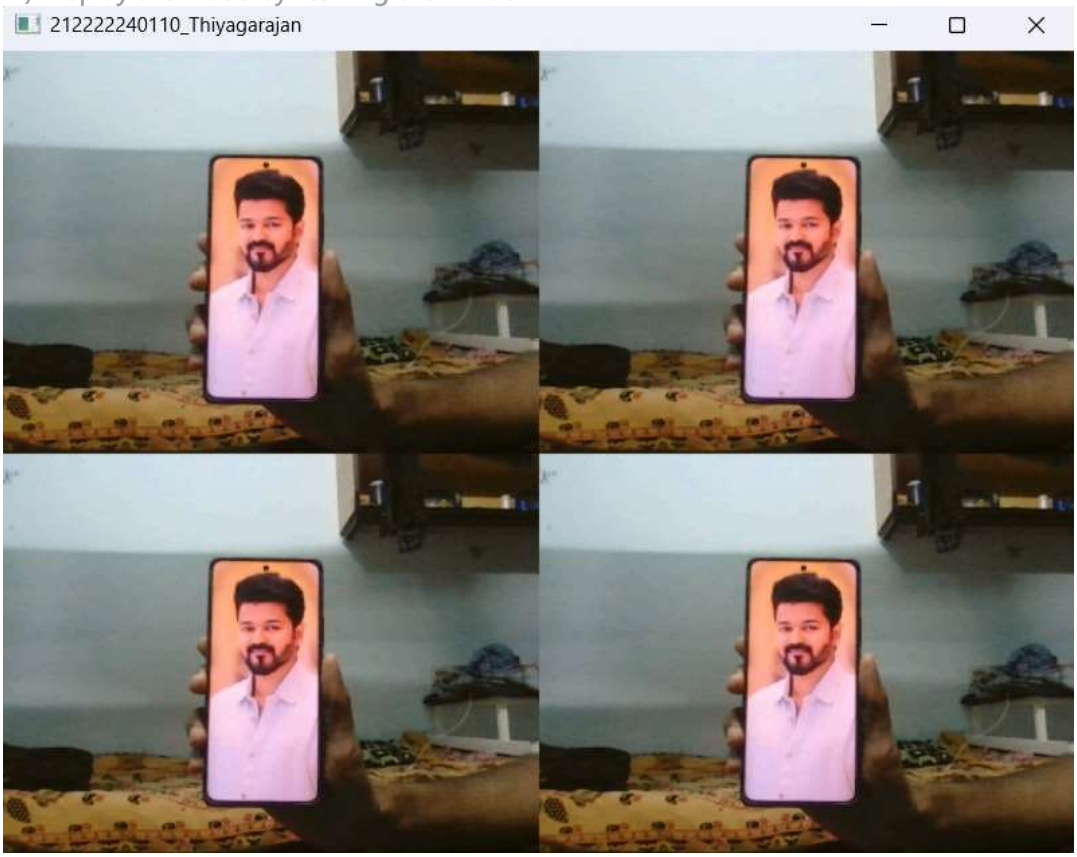
Output

i) Write the frame as JPG image

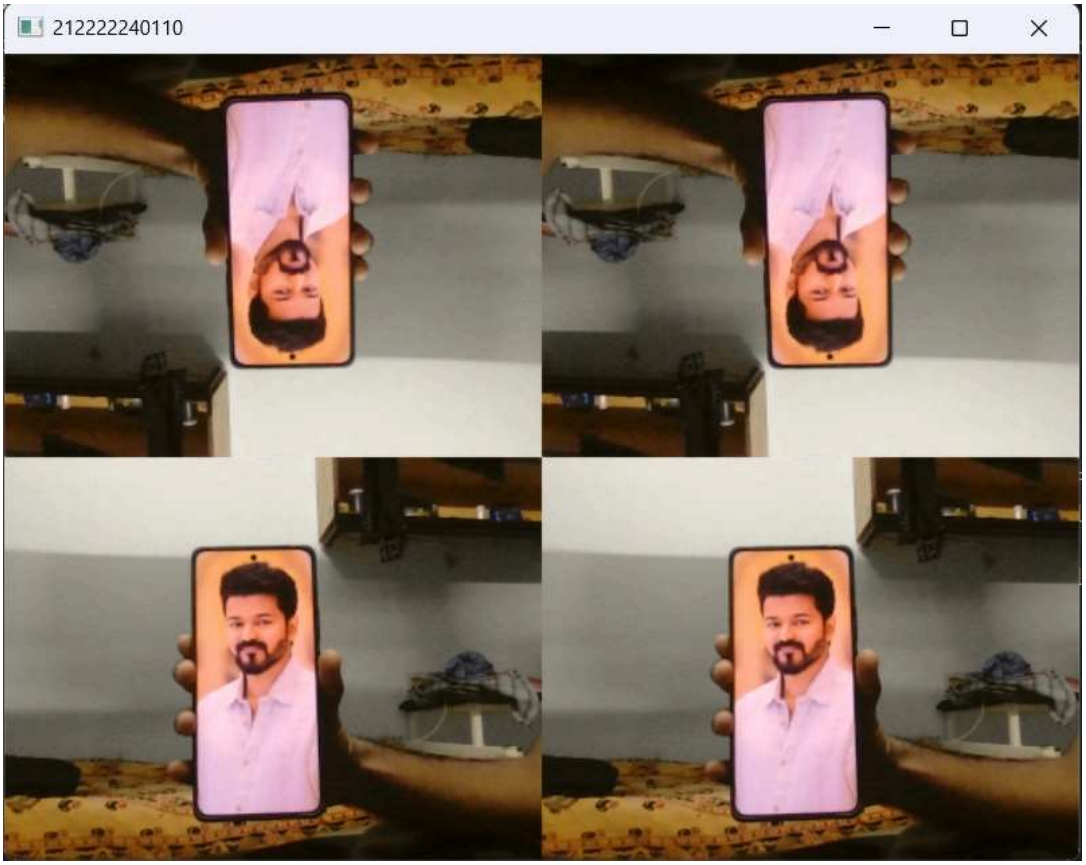
ii) Display the video



iii) Display the video by resizing the window



iv) Rotate and display the video



Result:

Thus the image is accessed from webcamera and displayed using openCV.