Session 4 -Basics in computer vision using opencv

In [1]:
```python
# To Load a image
import cv2                # importing library opencv
```

In [2]:
```python
print(cv2.__version__)    # to check the version of opencv package
```

```
4.4.0
```

In [3]:
```python
img = cv2.imread("2.jpg",0)               # 0 - Grayscale; 1 - color; -1 - color with alpha channel
cv2.imshow('image', img)                  # to display the output, where image is window name and img is file need to display
cv2.waitKey(0)                            # the output will wait till we close
cv2.destroyAllWindows()                   # once waitkey process completed output window will get closed
```

In [4]:
```python
# to print the matrix array of the input image
img = cv2.imread("2.jpg",0)
cv2.imshow('original', img)
print(img)         # to print the matrix array of the image
```

```
[[229 229 229 ... 238 242 242]
 [ 71  71  71 ...  69 235 239]
 [ 70  70  71 ...  66 232 237]
 ...
 [ 66  68  67 ...  69  67 208]
 [ 67  68  68 ...  69  67 208]
 [ 67  69  68 ...  68  67 208]]
```

In [5]:
```python
# Display imag for 10 seconds
img_new = cv2.imread('flower.jfif',1)
cv2.imshow('original', img_new)
cv2.waitKey(10000)
cv2.destroyAllWindows()
```

In [6]:
```python
# save a copy of the file after closing the window
img_new = cv2.imread('flower.jfif',1)
cv2.imshow('original', img_new)
cv2.waitKey(0)
cv2.destroyAllWindows()
cv2.imwrite('flowers.png', img_new)          # to save the image file with another name
```

Out[6]: True

In [7]:
```python
# if i press ESC key it will destroy all windows and if i press "s" key then it must be saved
import cv2
img=cv2.imread('2.jpg',0)
cv2.imshow('original', img)
k = cv2.waitKey(0)
if k==27:                          # 27 is the key value for ESC key
    cv2.destroyAllwindows()
elif k ==ord('s'):                 # return an integer representing the unicode code point of the character
    cv2.imwrite('2.png', img)
    cv2.destroyAllWindows()
```

In [8]:
```python
#read a video from webcam
import cv2
cap = cv2.VideoCapture(0)     # 0 or -1 is the index value of our inbuilt camera, if external camera then 1,2,3,4....

while(True):
    ret, frame = cap.read()              # ret will save true or fale if frame has been captured or not
    cv2.imshow('frame', frame)
    if cv2.waitKey(10) & 0Xff ==ord('q'):     # mask for 64 bit machine
        break

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

In [9]:
```python
#change the color of the video to grayscale
import cv2
cap = cv2.VideoCapture(0)

while(True):
    ret, frame = cap.read()
    gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)      # convret color to grayscale
    cv2.imshow('frame', gray)

    if cv2.waitKey(10) & 0Xff ==ord('q'):
        break

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

In [10]:
```python
#if the file name of the video or index of capturing device is wrong what will happen
import cv2
cap = cv2.VideoCapture(8)
print(cap.isOpened())
while(cap.isOpened()):
    ret, frame = cap.read()
    gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
    cv2.imshow('frame', gray)

    if cv2.waitKey(10) & 0Xff ==ord('q'):      # if we increase the waitkey parameter video will get delayed
        break

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

False

In [11]:
```python
#Access the width and height properties of video
import cv2
cap = cv2.VideoCapture(0)
print(cap.isOpened())
while(cap.isOpened()):
    ret, frame = cap.read()
    windowWidth = frame.shape[1]
    windowHeight = frame.shape[0]
    print(windowWidth)
    print(windowHeight)

    gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
    cv2.imshow('frame', gray)

    if cv2.waitKey(10) & 0Xff ==ord('q'):
        break

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

```
True
640
480
640
480
640
480
640
480
640
480
640
480
640
480
640
480
640
480
```

In [ ]: