```
from keras.preprocessing.image import ImageDataGenerator


train_datagen=ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_
text_dataset=ImageDataGenerator(rescale=1./255)


from tensorflow.keras.preprocessing.image import ImageDataGenerator train_datagen =
ImageDataGenerator(rescale= 1./255,horizontal_flip = True,vertical_flip = test_datagen =
ImageDataGenerator(rescale= 1./255)


x_train = train_datagen.flow_from_directory("/content/drive",target_size = (64,64) ,
                                            class_mode = "categorical",batch_size = 24)

     Found 12656 images belonging to 4 classes.


x_test = test_datagen.flow_from_directory("/content/drive",target_size = (64,64) ,
                                                                                clas

     Found 12702 images belonging to 4 classes.


import cv2


img = cv2.imread("/content/drive/MyDrive/AI_IBM/Dataset/TEST_SET/APPLES/n07740461_1191.jpg


img

     array([[[174, 188, 207],
     [173, 187, 206],
             [171, 185, 204],
             ...,
             [181, 192, 206],
             [180, 192, 204],
             [179, 191, 203]],

            [[175, 189, 208],
             [174, 188, 207],
             [174, 188, 207],
             ...,
             [182, 193, 207],
             [182, 193, 207],
             [181, 193, 205]],

            [[178, 192, 211],
             [177, 191, 210],
             [177, 191, 210],
             ...,
             [184, 195, 209],
```

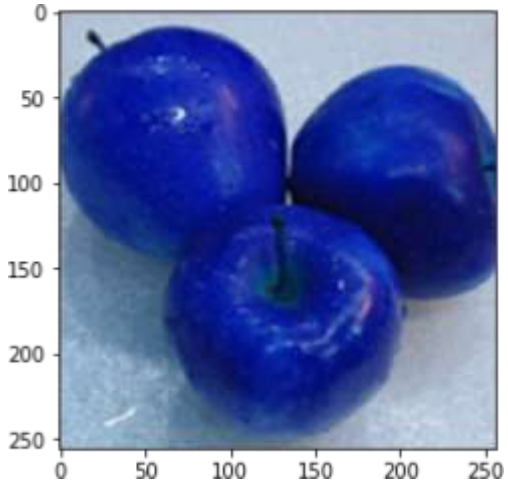
```
             [184, 195, 209],
             [184, 195, 209]],

            ...,
            [[161, 185, 209],
             [164, 188, 212],
             [163, 191, 215],
     ...,
             [184, 198, 216],
             [186, 200, 218],
             [187, 201, 220]],

            [[157, 185, 209],
             [158, 186, 210],
             [156, 187, 210],
     ...,
             [185, 199, 217],
             [187, 201, 219],
             [187, 201, 220]],

            [[154, 186, 209],
             [153, 185, 208],
             [150, 182, 205],
             ...,
             [187, 199, 217],
             [188, 202, 221],
             [189, 203, 222]]], dtype=uint8)


img.ndim

     3


type(img) numpy.ndarray


img.shape

     (256 , 256,  3)


img_flag = cv2.imread("/content/drive/MyDrive/AI_IBM/Dataset/TEST_SET/APPLES/n07740461_119


img_flag

     array([[[174, 188, 207],
     [173, 187, 206],
             [171, 185, 204],
     ...,
             [181, 192, 206],
             [180, 192, 204],
             [179, 191, 203]],
```

```
            [[175, 189, 208],
             [174, 188, 207],
             [174, 188, 207],
      ...,
             [182, 193, 207],
             [182, 193, 207],
             [181, 193, 205]],
            [[178, 192, 211],
             [177, 191, 210],
             [177, 191, 210],
      ...,
             [184, 195, 209],
             [184, 195, 209],
             [184, 195, 209]],

            ...,

            [[161, 185, 209],
             [164, 188, 212],
             [163, 191, 215],
      ...,
             [184, 198, 216],
             [186, 200, 218],
             [187, 201, 220]],

            [[157, 185, 209],
             [158, 186, 210],
             [156, 187, 210],
      ...,
             [185, 199, 217],
             [187, 201, 219],
             [187, 201, 220]],

            [[154, 186, 209],
             [153, 185, 208],
             [150, 182, 205],
              ...,
             [187, 199, 217],
             [188, 202, 221],
             [189, 203, 222]]], dtype=uint8)
```

```
import matplotlib.pyplot as plt
```

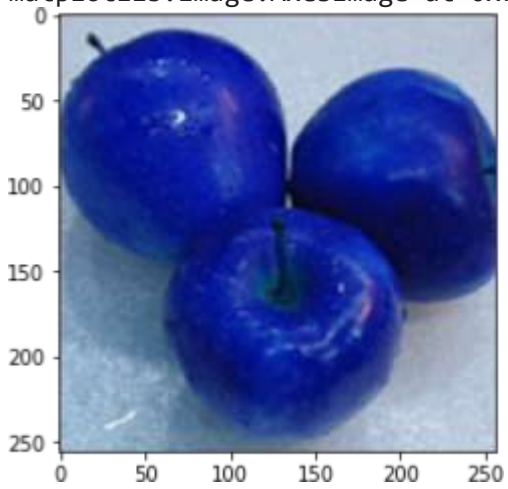
```
plt.imshow(img)
```

```
      < matplotlib.image.AxesImage at 0x7fda968014d 0>
```




```
plt.imshow(img_flag)
```

```
   < matplotlib.image.AxesImage at 0x7fda 962e0190>
```

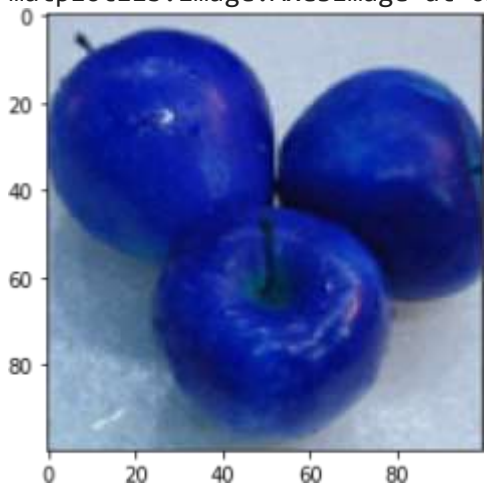



```
resized_img = cv2.resize(img,(100,100))
```

```
resized_img.shape (100
     , 100,  3)
```

```
plt.imshow(resized_img)
```

```
   < matplotlib.image.AxesImage at 0x7fda962c 7f90>
```

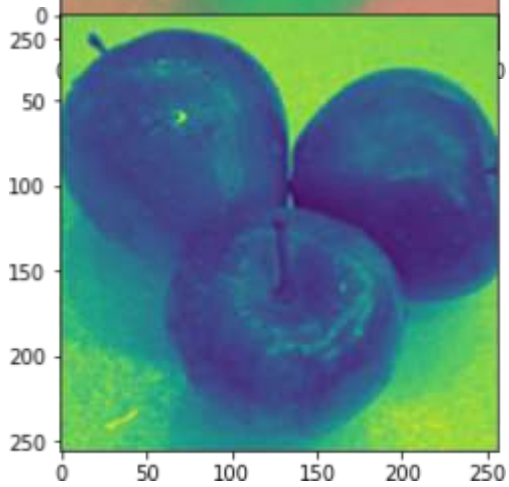


```
cv_img = cv2.cvtColor(img,cv2.COLOR_BGR2YCR_CB)


plt.imshow(cv_img)
```

```
<matplotlib.image.AxesImage at 0x7fda96233810>
```

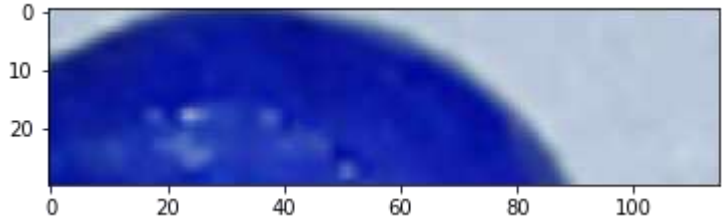

```
cv_img = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)

plt.imshow(cv_img)
```

```
<matplotlib.image.AxesImage at 0x7fda96218e50>
```



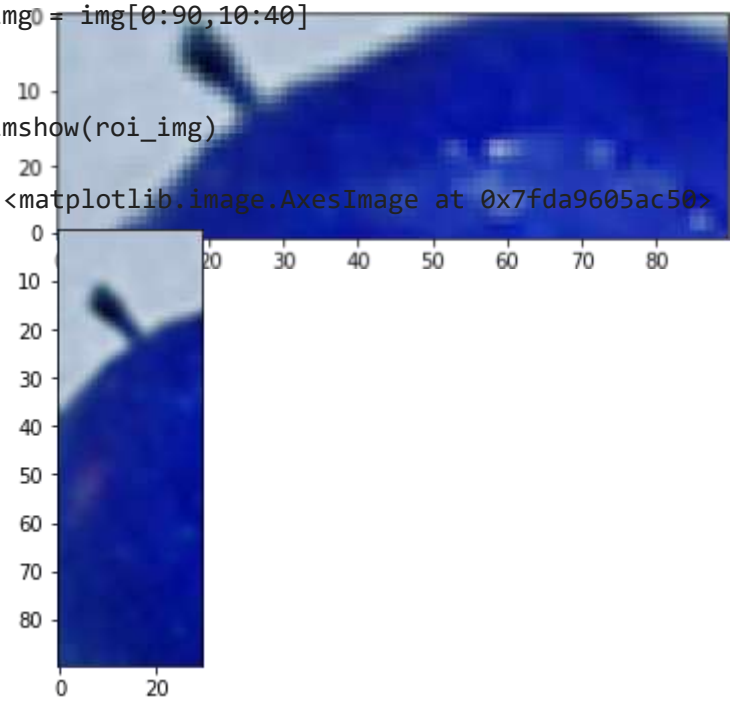

```
roi_img = img[50:280,35:150] roi_img
= img[10:40,35:150]


plt.imshow(roi_img)
```

```
< matplotlib.image.AxesImage at 0x7fda961935d 0>
```




```
roi_img = img[10:40,0:90]


plt.imshow(roi_img)
```

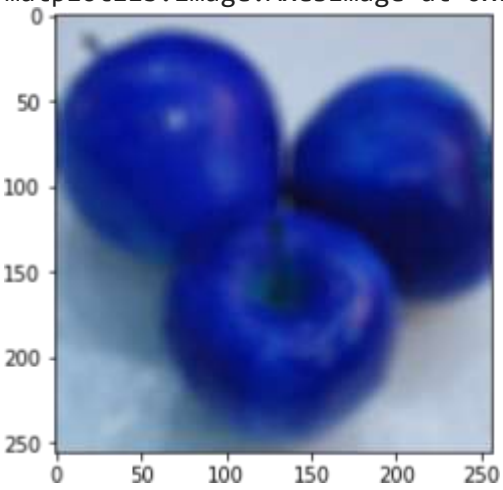
```
      <matplotlib.image.AxesImage at 0x7fda960f3610>
roi_img = img[0:90,10:40]
```




```
plt.imshow(roi_img)
      <matplotlib.image.AxesImage at 0x7fda9605ac50>
```



```
img_bl = cv2.blur(img,(10,10))


plt.imshow(img_bl)

   < matplotlib.image.AxesImage at 0x7fda 96041b10>
```

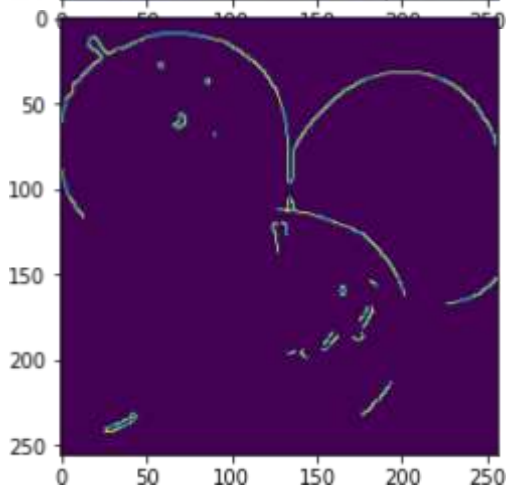



```
img_gbl = cv2.GaussianBlur(img,(5,5),0)


plt.imshow(img_gbl)
```

```
<matplotlib.image.AxesImage at 0x7fda95fb41d0>
```

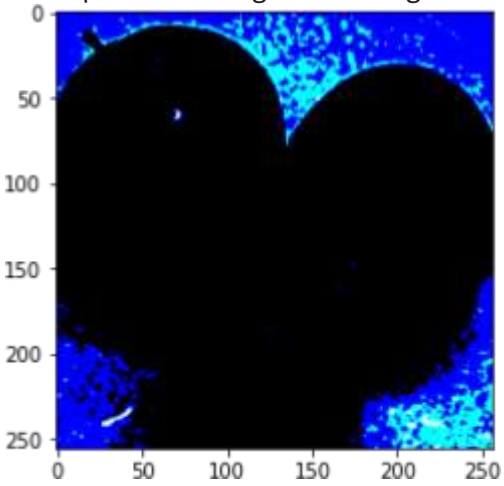
```
img_edge = cv2.Canny(img,230,350)

plt.imshow(img_edge)
```

```
<matplotlib.image.AxesImage at 0x7fda95f1a850>
```

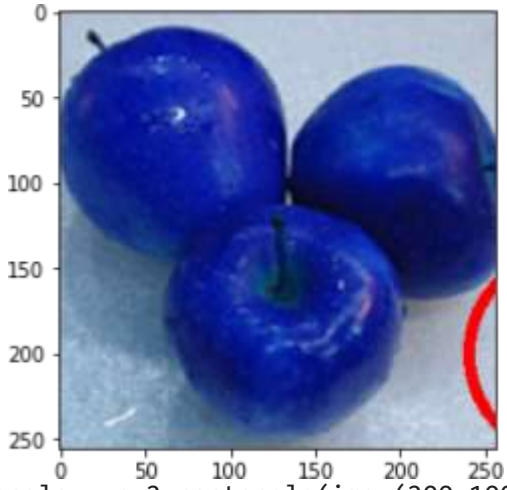


```
thresh, thresh_img = cv2.threshold(img, 200, 255, cv2.THRESH_BINARY)

plt.imshow(thresh_img)
```

```
< matplotlib.image.AxesImage at 0x7fda962ab 910>
```

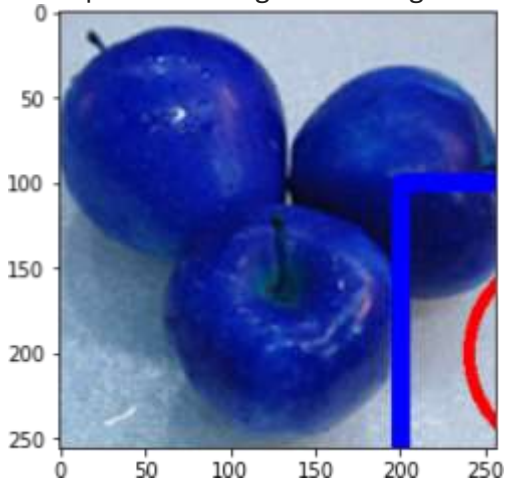


```
circle = cv2.circle(img,(300,200),60,(255,0,0),5)

plt.imshow(img)
< matplotlib.image.AxesImage at 0x 7fda96021850>
```



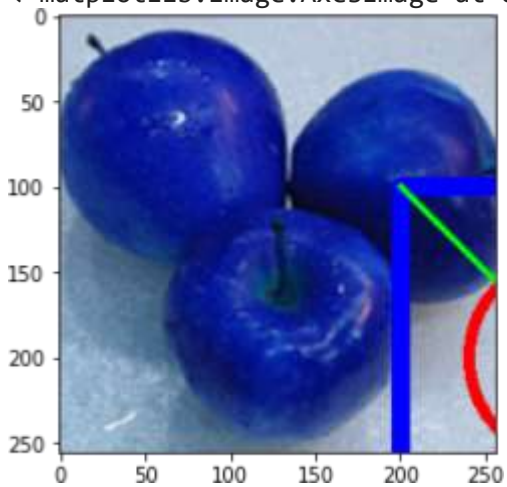

```
rectangle = cv2.rectangle(img,(200,100),(400,300),(0,0,255),10)


plt.imshow(img)
```

```
< matplotlib.image.AxesImage at 0x7fda95e 23b50>
```




```
line = cv2.line(img,(200,100),(400,300),(0,255,0),3)


plt.imshow(img)
```

```
< matplotlib.image.AxesImage at 0x7fda 95e15250>
```



```
text = cv2.putText(img,"Opencv",(200,50),cv2.FONT_HERSHEY_SIMPLEX,2,(255,255,255),5)


plt.imshow(img)
```

```
<matplotlib.image.AxesImage at 0x7fda95d7a910>
```