Experiment-3

Making objects on Image &Colour Detection Technique

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Branch :AI&ML-1   **Section/Group :b**

Semester : 5   **Date of Performance :**

Subject Name: DIP   **Subject Code :** CSF-3336

1. **AIM/OVERVIEW of the Practical**

   In this experiment we have learnt about various colour detection technique by using the various inbuilt libraries of python. In this we have used the jupyter notebook software.

2. **Task to be Done**

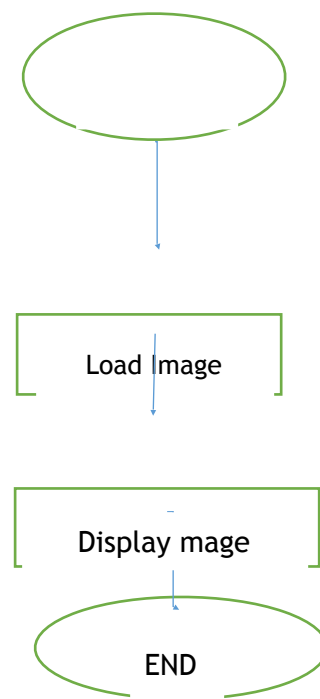   Various tasks which we have to performed in this experiment that are

   - Read image
   - Colour detecting
   - Display image

3. **Required Libraries Or Softwares**

   Software – Jupyter Notebook

   Libraries – numpy, matplotlib, pil, scikit Image,opencv

4. **Algorithm/Flowchart**

```
        ( )
         |
         v
    [ Load Image ]
         |
         v
    [ Display mage ]
         |
         v
      ( END )
```

Steps for Experiment/Practical

```python
# Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# drawing a line on an Image usinig opencv module
cv.line(img,(0,0), (150,150), (255,255,255), 5)
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows


# Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# drawing a line on an Image usinig opencv module
cv.line(img,(0,0), (150,150), (255,255,255), 5)
# to draw the rectange on the plot
cv.rectangle(img, (12,35), (200,150), (0,0,255), 5)
# to draw the circle on the plot
cv.circle(img, (120,60), 35, (0,214,0), -5)
# a bunch of points in polygon, datatype np int32
pts = np.array([[10,5], [20,30], [70,20], [110,40]], np.int32)
pts = pts.reshape((-1,1,2))
cv.polylines(img,(pts), True, (155,0,0), 3)
# to write on am image
font = cv.FONT_HERSHEY_SIMPLEX
cv.putText(img, 'writing with openCV!',(10,130), font, 0.6, (120,12,112), 1, cv.LINE_AA
)
# Displaying the image
```

```
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows


# Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./water.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
print(px)


# Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
img[55,55]= [120,100,215]
print(px)


# Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
```

```python
img[55,55]= [255,255,255]
# Region of an Image
roi=img[100:120, 100:150]
print(roi)


#Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
img[55,55]= [255,255,255]
# Region of an Image
img[100:220, 120:250] = [155,247,157]
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows


# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
img[55,55]= [255,255,255]
# Region of an Image
img[100:220, 120:250] = [155,247,157]
# To Copy and past an Image
water_image = img[137:211, 209:294]
img[0:74, 0:85] = water_image
```

```python
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows



# Importing required modules
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Ploting and Displaying the image
plt.figure(figsize=(20,8))
plt.imshow(img)



# Importing required modules
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Convert GBR colour mode to RGB colour mode
RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
# Ploting and Displaying the image
plt.figure(figsize=(20,8))
plt.imshow(RGBimg)

# Importing required modules
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
```

```python
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Convert GBR colour mode to RGB colour mode
RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
#Convert RGB colour mode to HSV colour mode
HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
# Ploting and Displaying the image
plt.figure(figsize=(10,10))
plt.imshow(HSVimg)


# Importing required modules
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Convert GBR colour mode to RGB colour mode
RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
#Convert RGB colour mode to HSV colour mode
HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
lower = np.array([25,150,50])
upper = np.array([35,255,255])
# To detetic a specific color eg: yellow
mask = cv.inRange(HSVimg, lower, upper)
# Ploting and Displaying the image
plt.figure(figsize=(20,8))
plt.imshow(mask)


# Importing required modules
import numpy as np
import cv2 as cv
import matplotlib.pyplot as plt
# Defining and reading an Image usinig opencv module
```

```python
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Convert GBR colour mode to RGB colour mode
RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
#Convert RGB colour mode to HSV colour mode
HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
lower = np.array([25,150,50])
upper = np.array([35,255,255])
# To detetic a specific color eg: yellow
mask = cv.inRange(HSVimg, lower, upper)
# To blacken out the other colors
res=cv.bitwise_and(RGBimg, RGBimg, mask=mask)
# Ploting and Displaying the image
plt.figure(figsize=(20,8))
plt.imshow(res)


import cv2 as cv
import matplotlib.pyplot as plt
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# Convert GBR colour mode to RGB colour mode
RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
#Convert RGB colour mode to HSV colour mode
HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
lower = np.array([0,150,50])
upper = np.array([10,255,255])
# To detetic a specific color eg: yellow
mask = cv.inRange(HSVimg, lower, upper)
# Ploting and Displaying the image
plt.figure(figsize=(20,8))
plt.imshow(mask)
```
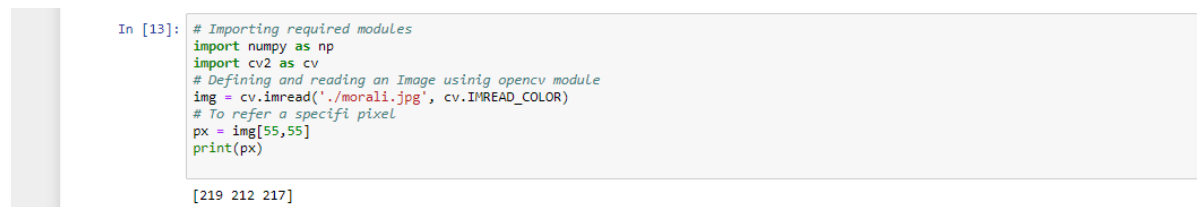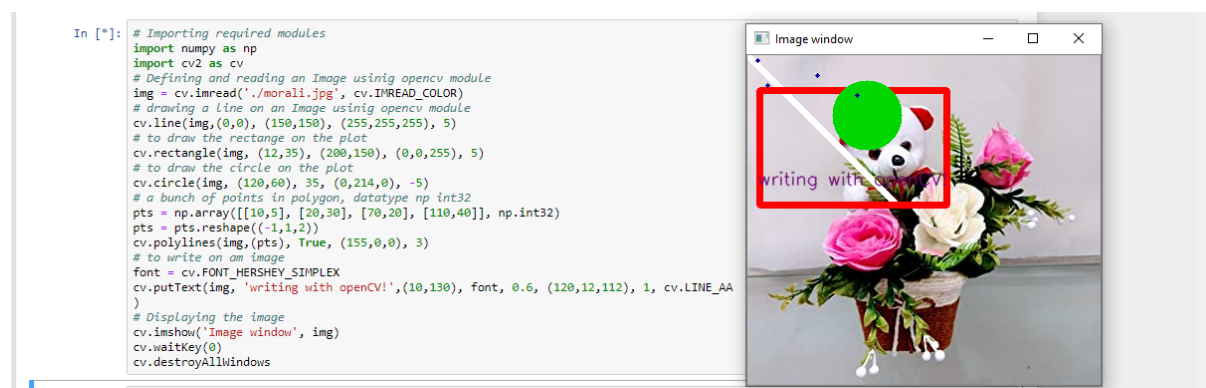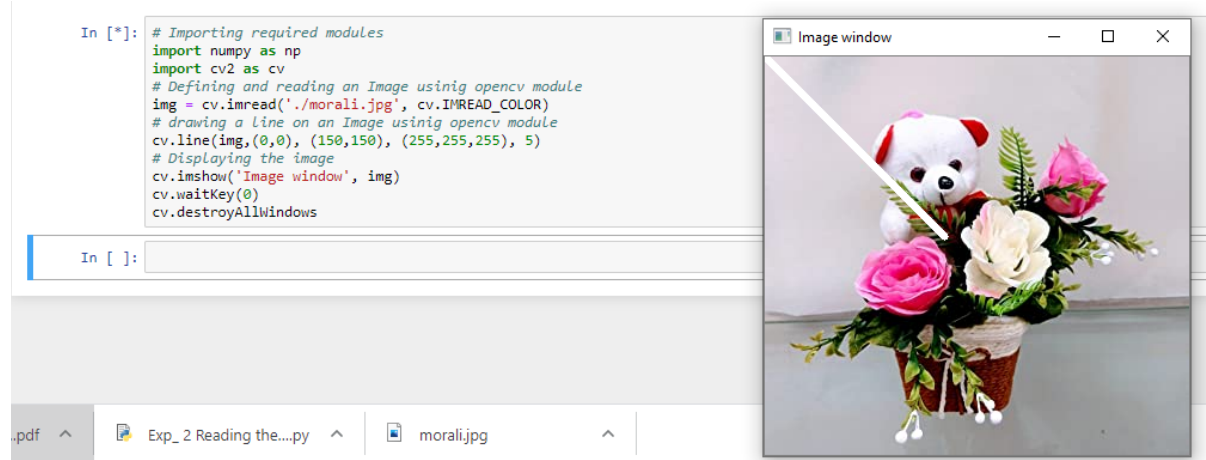
5. **The command that we have learned today in the program :**

In this program we have learnt various command for drawing object on image and for color detection of an image.

We have learn commands that are opencv library, matplotlib library, PIL module.

6. **Output**

```
# To modify that pixcel
img[55,55]= [255,255,255]
# Region of an Image
roi=img[100:120, 100:150]
print(roi)
```

```
[[[202 189 197]
  [207 190 199]
  [213 192 200]
  ...
  [156 152 151]
  [ 73  68  67]
  [ 12   8   7]]

 [[164 170 175]
  [193 198 201]
  [219 212 217]
  ...
  [ 21  16  13]
  [  5   0   0]
  [  5   0   0]]

 [[110 149 147]
  [126 166 164]
  [185 197 199]
  ...
  [  7   1   0]
  [ 35  28  25]
  [106 100  95]]

 ...

 [[192 198 205]
  [194 196 204]
  [203 198 207]
```
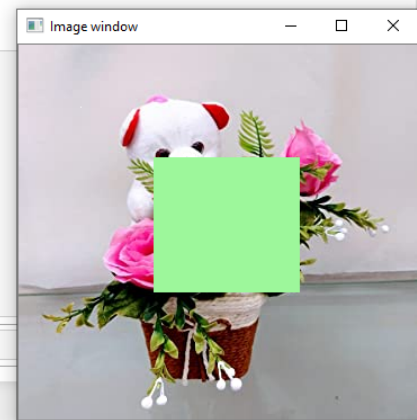
```
  [  0   1  12]
  [ 16  19  33]]]
```

In [*]:
```python
#Importing required modules
import numpy as np
import cv2 as cv
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
img[55,55]= [255,255,255]
# Region of an Image
img[100:220, 120:250] = [155,247,157]
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows
```
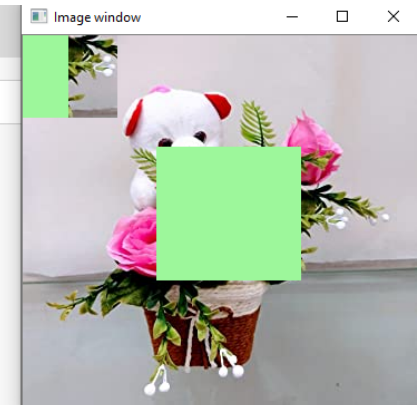

In [ ]:

```
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows
```

Out[19]: <function destroyAllWindows>

In [*]:
```python
# Defining and reading an Image usinig opencv module
img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
# To refer a specifi pixel
px = img[55,55]
# To modify that pixcel
img[55,55]= [255,255,255]
# Region of an Image
img[100:220, 120:250] = [155,247,157]
# To Copy and past an Image
water_image = img[137:211, 209:294]
img[0:74, 0:85] = water_image
# Displaying the image
cv.imshow('Image window', img)
cv.waitKey(0)
cv.destroyAllWindows
```

```
]:  # Importing required modules
    import numpy as np
    import cv2 as cv
    import matplotlib.pyplot as plt
    # Defining and reading an Image usinig opencv module
    img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
    # Ploting and Displaying the image
    plt.figure(figsize=(20,8))
    plt.imshow(img)
```

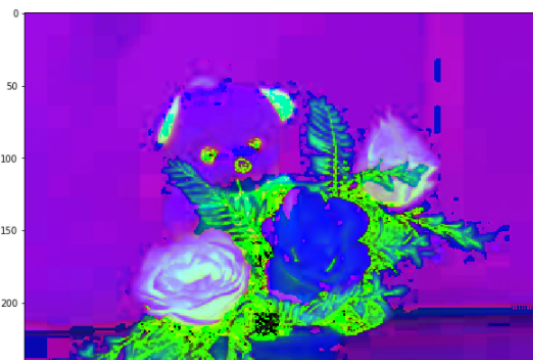]: <matplotlib.image.AxesImage at 0x27e2c58c8d0>

```
    # Importing required modules
    import numpy as np
    import cv2 as cv
    import matplotlib.pyplot as plt
    # Defining and reading an Image usinig opencv module
    img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
    # Convert GBR colour mode to RGB colour mode
    RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
    # Ploting and Displaying the image
    plt.figure(figsize=(20,8))
    plt.imshow(RGBimg)
```
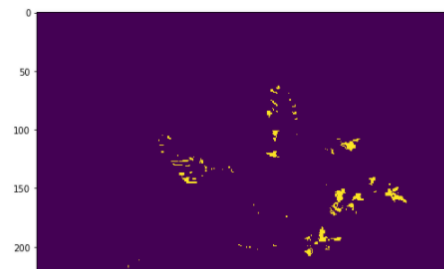
Out[23]: <matplotlib.image.AxesImage at 0x27e2c920518>


```
    import cv2 as cv
    import matplotlib.pyplot as plt
    # Defining and reading an Image usinig opencv module
    img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
    # Convert GBR colour mode to RGB colour mode
    RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
    #Convert RGB colour mode to HSV colour mode
    HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
    # Ploting and Displaying the image
    plt.figure(figsize=(10,10))
    plt.imshow(HSVimg)
```

: <matplotlib.image.AxesImage at 0x27e2c5d6240>


```
    import cv2 as cv
    import matplotlib.pyplot as plt
    # Defining and reading an Image usinig opencv module
    img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
    # Convert GBR colour mode to RGB colour mode
    RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
    #Convert RGB colour mode to HSV colour mode
    HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
    lower = np.array([25,150,50])
    upper = np.array([35,255,255])
    # To detetic a specific color eg: yellow
    mask = cv.inRange(HSVimg, lower, upper)
    # Ploting and Displaying the image
    plt.figure(figsize=(20,8))
    plt.imshow(mask)
```

Out[25]: <matplotlib.image.AxesImage at 0x27e2c84a2e8>


```
    import cv2 as cv
    import matplotlib.pyplot as plt
    # Defining and reading an Image usinig opencv module
    img = cv.imread('./morali.jpg', cv.IMREAD_COLOR)
    # Convert GBR colour mode to RGB colour mode
    RGBimg = cv.cvtColor(img, cv.COLOR_BGR2RGB)
    #Convert RGB colour mode to HSV colour mode
    HSVimg = cv.cvtColor(RGBimg, cv.COLOR_RGB2HSV)
    lower = np.array([25,150,50])
    upper = np.array([35,255,255])
    # To detetic a specific color eg: yellow
    mask = cv.inRange(HSVimg, lower, upper)
    # To blacken out the other colors
    res=cv.bitwise_and(RGBimg, RGBimg, mask=mask)
    # Ploting and Displaying the image
    plt.figure(figsize=(20,8))
    plt.imshow(res)
```

|: <matplotlib.image.AxesImage at 0x27e2c658f98>