# Experiment-10

# MORPHOLOGICAL TRANSFORMATION

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**Semester :** 5 **Date of Performance :**

**Subject Name:** DIP **Subject Code :** CSF-336

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

   In this experiment we have perform morphological transformation. 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 images
   - Perform operation on images
   - Display image

3. **Required Libraries Or Softwares**

   Software – Jupyter Notebook

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

## Steps for Experiment/Practical

1. #Erosion

   ```
   import cv2 as cv
   import numpy as np
   img = cv.imread('imgg1.jpg')
   kernel = np.ones((5,5),np.uint8)
   erosion = cv.erode(img,kernel,iterations = 1)
   cv.imshow('input image',img)
   cv.imshow('erosion image',erosion)
   cv.waitKey(0)
   cv.destroyAllWindows()
   ```

2. #Dilation

   ```
   import cv2 as cv
   ```

```
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
dilation = cv.dilate(img,kernel,iterations = 1)
cv.imshow('input image',img)
cv.imshow('dilation image',dilation)
cv.waitKey(0)
cv.destroyAllWindows()
```

3. #Opening

```
import cv2 as cv
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
opening = cv.morphologyEx(img, cv.MORPH_OPEN, kernel)
cv.imshow('input image',img)
cv.imshow('opening image',opening)
cv.waitKey(0)
cv.destroyAllWindows()
```

4. #Closing

```
import cv2 as cv
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
closing = cv.morphologyEx(img, cv.MORPH_CLOSE, kernel)
cv.imshow('input image',img)
cv.imshow('closing image',closing)
cv.waitKey(0)
cv.destroyAllWindows()
```

5. #morphological gradient

```
import cv2 as cv
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
```

```
gradient = cv.morphologyEx(img, cv.MORPH_GRADIENT, kernel)
cv.imshow('input image',img)
cv.imshow('Morphological Gradient image',gradient)
cv.waitKey(0)
cv.destroyAllWindows()
```

6. Top Hat

```
import cv2 as cv
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
tophat = cv.morphologyEx(img, cv.MORPH_TOPHAT, kernel)
cv.imshow('input image',img)
cv.imshow('Top Hat image',tophat)
cv.waitKey(0)
cv.destroyAllWindows()
```

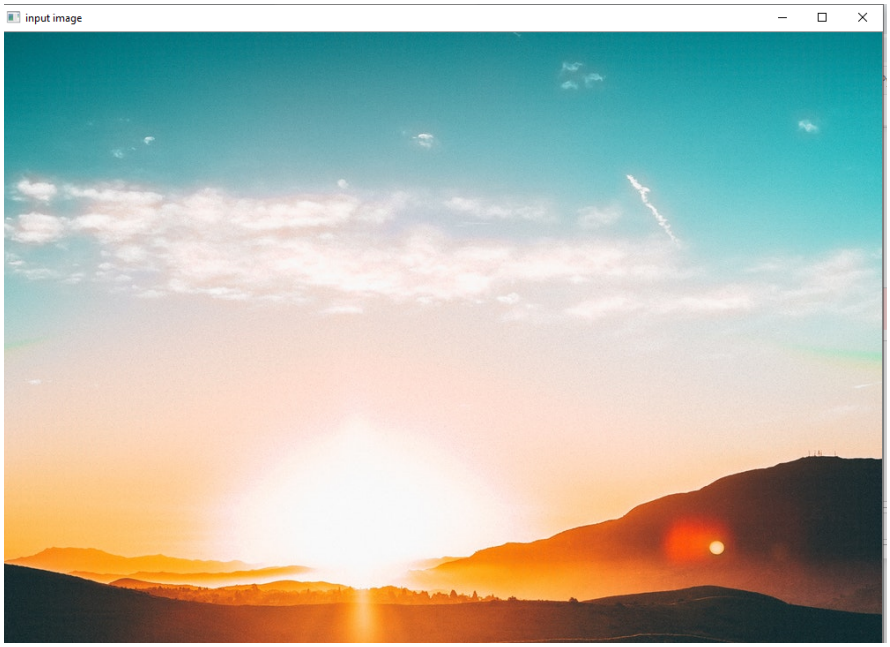
7. Black Hat

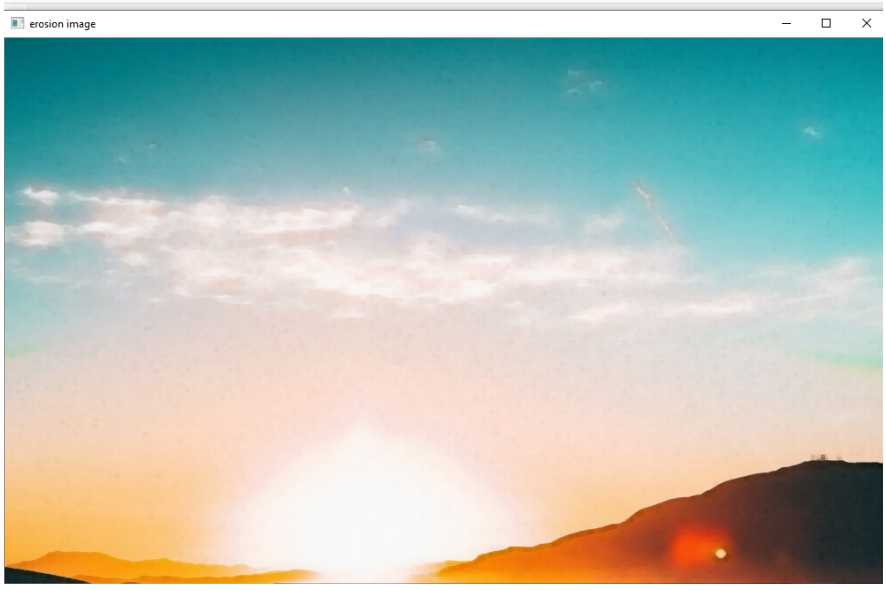
```
import cv2 as cv
import numpy as np
img = cv.imread('imgg1.jpg')
kernel = np.ones((5,5),np.uint8)
blackhat = cv.morphologyEx(img, cv.MORPH_BLACKHAT, kernel)
cv.imshow('input image',img)
cv.imshow('Black Hat',blackhat)
cv.waitKey(0)
cv.destroyAllWindows()
```

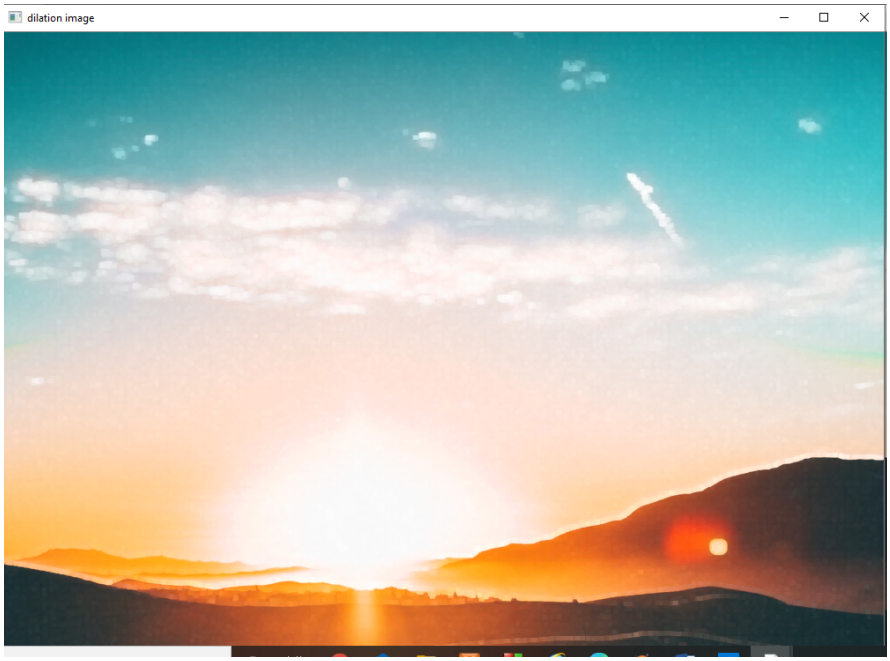
## 4. The command that we have learned today in the program :

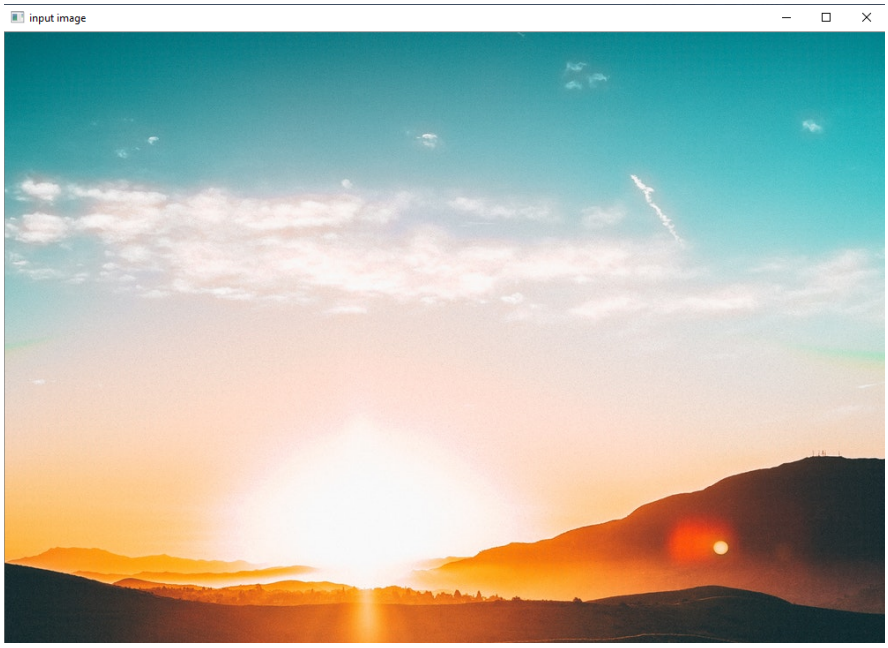
In this program we have learnt various command for morphological transformation.

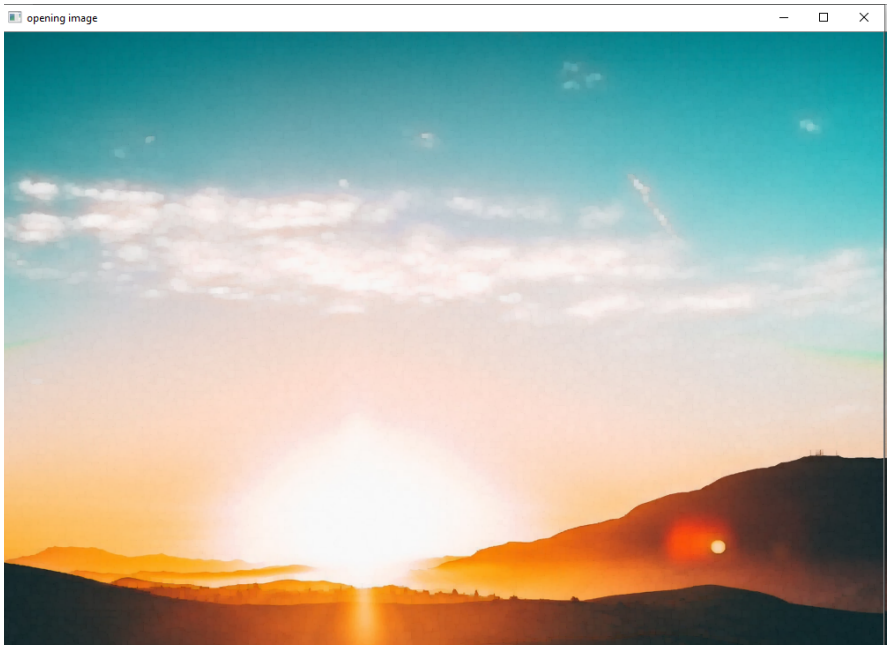
## Output

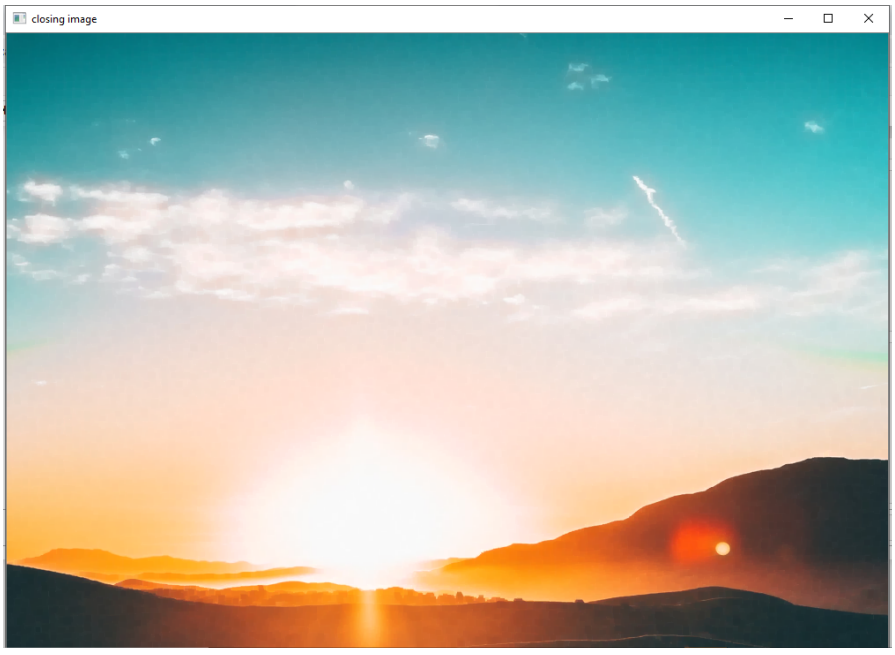


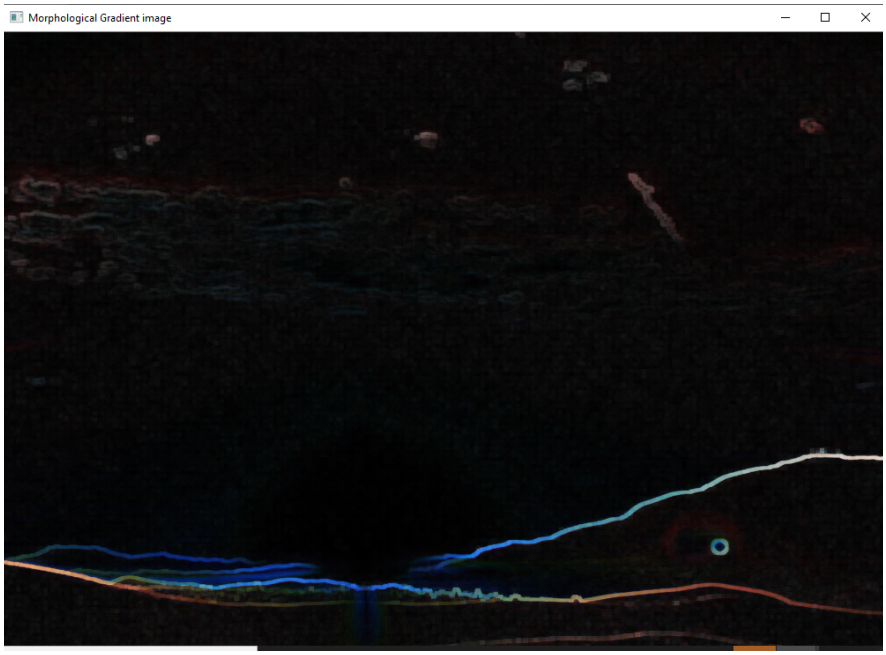



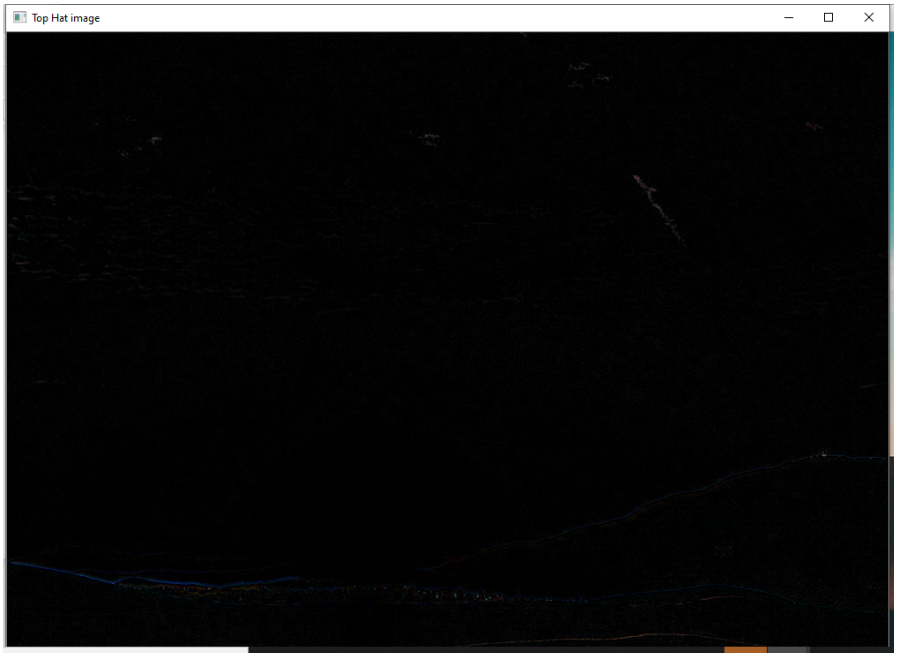

dilation image

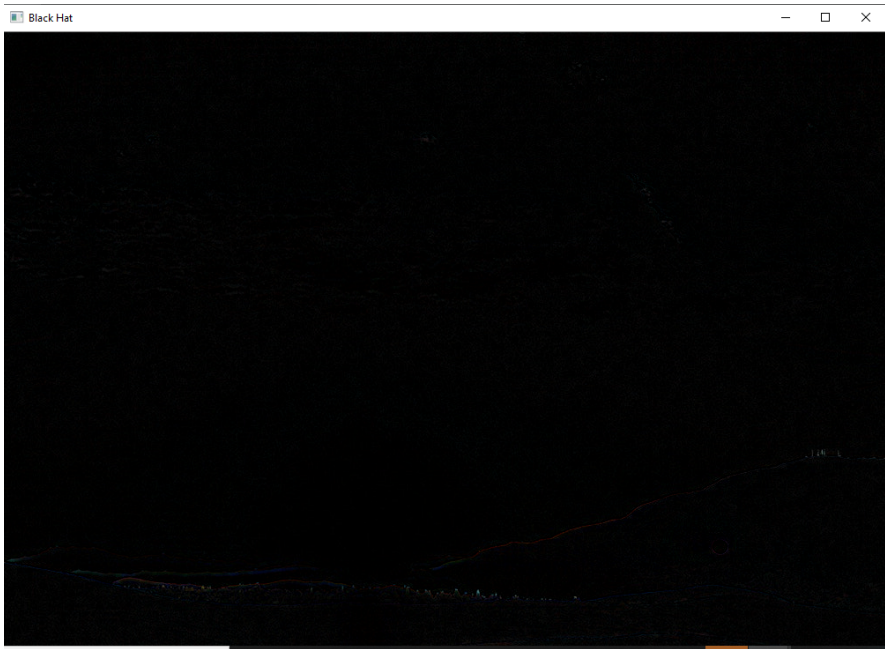

input image


opening image


closing image


Morphological Gradient image


Top Hat image


Black Hat