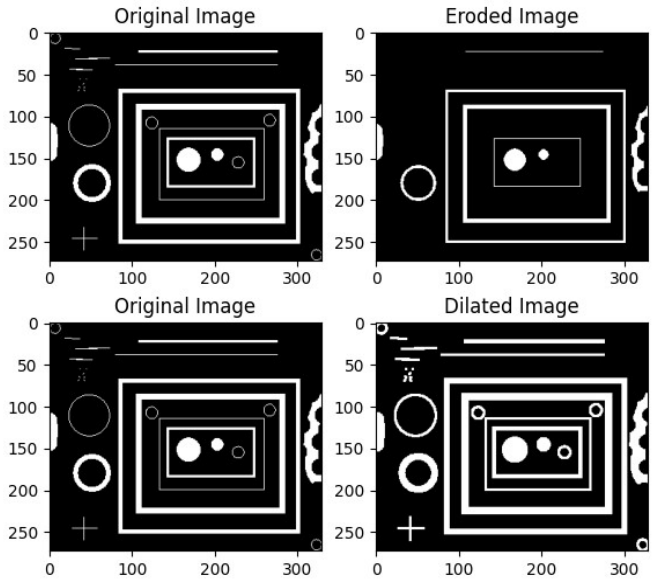
Expt 5 a

```
#EXPT 5A
#Erosion and Dilation of an image
import cv2
import numpy as np
import matplotlib.pylab as plt

#Reading image as grayscale
img=cv2.imread("E:/IPMV images/blobs.png",0)
plt.subplot(2,2,1)
plt.title('Original Image')
plt.imshow(img,cmap='gray')

plt.subplot(2,2,3)
plt.title('Original Image')
plt.imshow(img,cmap='gray')

strct = np.ones([3,3],img.dtype)

img_erosion = cv2.erode(img,strct,iterations=1)
plt.subplot(2,2,2)
plt.title('Eroded Image')
plt.imshow(img_erosion,cmap='gray')

img_dilation = cv2.dilate(img,strct,iterations=1)
plt.subplot(2,2,4)
plt.title('Dilated Image')
plt.imshow(img_dilation,cmap='gray')
plt.show()
```

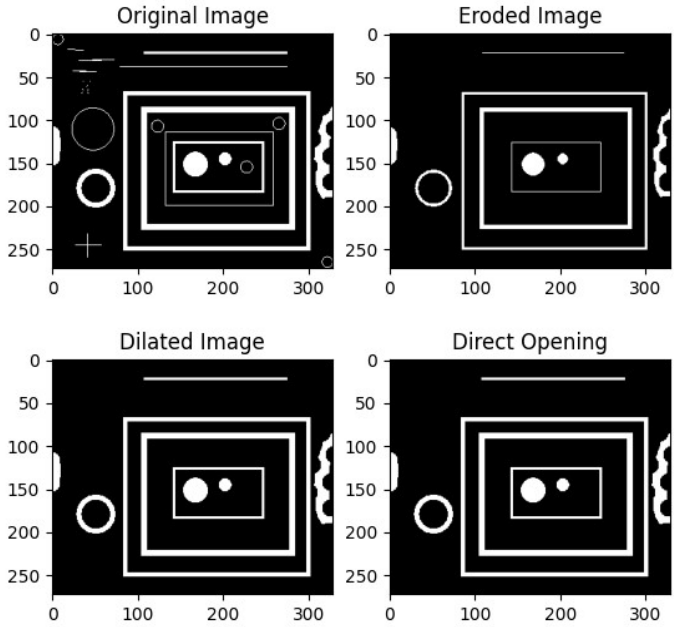
Output:



Expt 5 b

```
#Expt 5B
#First read img then erode then dilate the eroded img
import cv2
import numpy as np
import matplotlib.pylab as plt

#Reading image as grayscale
img=cv2.imread("E:/IPMV images/blobs.png",0)
plt.subplot(2,2,1)
plt.title('Original Image')
plt.imshow(img,cmap='gray')

strct = np.ones([3,3],img.dtype)

img_erosion = cv2.erode(img,strct,iterations=1)
plt.subplot(2,2,2)
plt.title('Eroded Image')
plt.imshow(img_erosion,cmap='gray')

img_dilation = cv2.dilate(img_erosion,strct,iterations=1)
plt.subplot(2,2,3)
plt.title('Dilated Image')
plt.imshow(img_dilation,cmap='gray')

direct_opening=cv2.morphologyEx(img,cv2.MORPH_OPEN,strct)
plt.subplot(2,2,4)
plt.title('Direct Opening')
plt.imshow(direct_opening,cmap='gray')
plt.show()
```

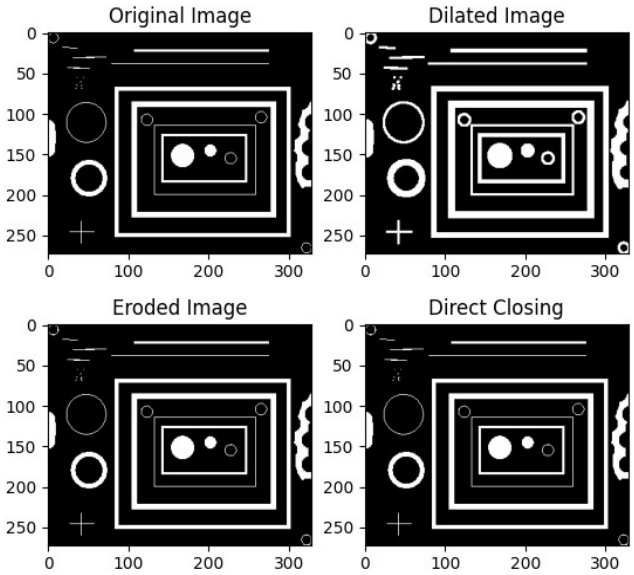
Output:



EXPT 5 c

```
#Expt 5C
#First read img then dilate img then erode the dilated img
import cv2
import numpy as np
import matplotlib.pylab as plt

#Reading image as grayscale
img=cv2.imread("E:/IPMV images/blobs.png",0)
plt.subplot(2,2,1)
plt.title('Original Image')
plt.imshow(img,cmap='gray')

strct = np.ones([3,3],img.dtype)

img_dilation = cv2.dilate(img,strct,iterations=1)
plt.subplot(2,2,2)
plt.title('Dilated Image')
plt.imshow(img_dilation,cmap='gray')

img_erosion = cv2.erode(img_dilation,strct,iterations=1)
plt.subplot(2,2,3)
plt.title('Eroded Image')
plt.imshow(img_erosion,cmap='gray')

direct_closing=cv2.morphologyEx(img,cv2.MORPH_CLOSE,strct)
plt.subplot(2,2,4)
plt.title('Direct Closing')
plt.imshow(direct_closing,cmap='gray')
plt.show()
```

Output:



EXPT :

Morphological Processes

```
#morphological processes
import cv2
import numpy as np
import matplotlib.pylab as plt

abc=cv2.imread("E:/IPMV images/tom jerry.jpg",0)
plt.subplot(2,2,1)
plt.title('Original Image')
plt.imshow(abc,cmap='gray')

strct=np.ones([3,3],np.uint8)
#erosion operation
img_erosion=cv2.erode(abc,strct,iterations=3)
plt.subplot(2,2,2)
plt.title('Eroded Image')
plt.imshow(img_erosion,cmap='gray')

xyz=abc-img_erosion
plt.subplot(2,2,3)
plt.title('Boundry of an Image')
plt.imshow(xyz,cmap='gray')
plt.show()
```

Output: