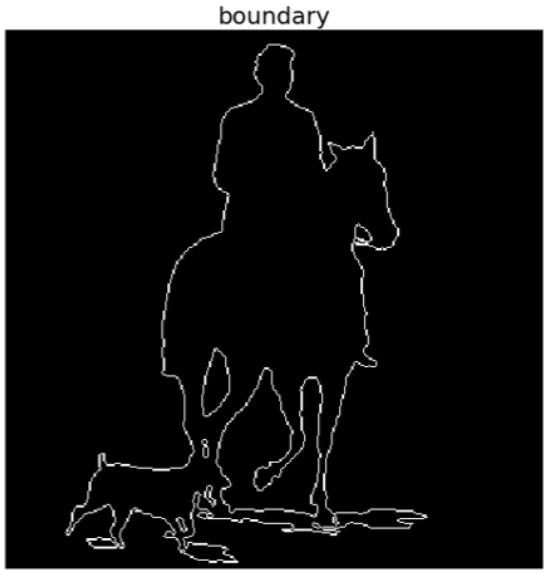
Lab Assignment 9

1. **Boundary Extraction using Morphology**

The formula which can be used for boundary extraction is given below. One example of input and output is also provided.

$$\beta(A) = A - (A \ominus B)$$

Where A is the original image and B is the structuring element



2. **Hole filing using Morphology**

Fill the holes in a binary image using morphology. You can use the Python library:

from scipy.ndimage.morphology import binary_fill_holes

and use direct inbuilt function “binary_fill_holes”

The example of hole filing is shown below.

3. **Binary erosion** with different size of rectangle (structuring element). You can use the below code for implementation.

```
from skimage.morphology import binary_erosion, rectangle
im = rgb2gray(imread('Image path'))
print(np.max(im))
im[im <= 0.5] = 0
im[im > 0.5] = 1
plt.gray()
plt.figure(figsize=(20,10))
plt.subplot(131)
plt.imshow(im)
plt.title('original', size=20)
plt.axis('off')
plt.subplot(1,3,2)
Here:   im1 = use the function "binary_erosion" with rectangle size (1,5)
plt.imshow(im1)
plt.title('erosion with rectangle size (1,5)', size=20)
plt.axis('off')
plt.subplot(1,3,3)
Here:   im1 = use the function "binary_erosion" with rectangle size (1,15)
plt.imshow(im1)
plt.title('erosion with rectangle size (1,15)', size=20)
plt.axis('off')
plt.show()
```