Exercise 4

1.

```
Mat thresholded;
threshold(gray, thresholded, current_threshold, max_threshold,
THRESH_BINARY);
imshow("Binary threshold",thresholded);
```

this function is used to show the image which is combined by white and black pixels, which means the pixels are all 0 and 255.

```
// Band thresholding
Mat binary_image1,binary_image2,band_thresholded_image;
int threshold1 = 27, threshold2 = 125;
threshold(gray, binary_image1, threshold1, max_threshold,
THRESH_BINARY);
threshold(gray, binary_image2, threshold2, max_threshold,
THRESH_BINARY_INV);
bitwise_and( binary_image1, binary_image2,
band_thresholded_image );
imshow("Band Thresholding", band_thresholded_image);
```

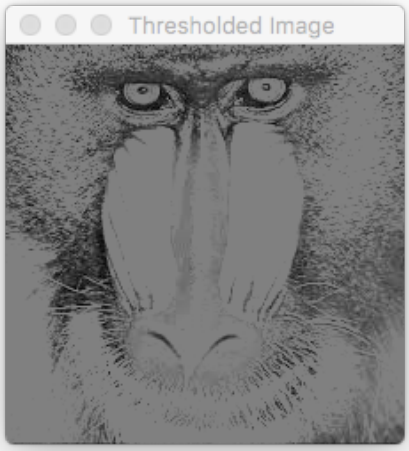
band thresholding is used to return to thresh_binary_inv which means the black pixel in previous code is changed to the white pixel, and the white pixel in previous code is changed to the black pixel.

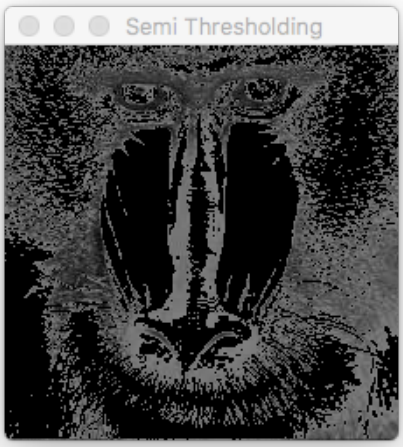
```
// Semi thresholding
Mat semi_thresholded_image;
threshold(gray, semi_thresholded_image, current_threshold,
max_threshold, THRESH_BINARY_INV | THRESH_OTSU);
bitwise_and( gray, semi_thresholded_image,
semi_thresholded_image );
imshow("Semi Thresholding", semi_thresholded_image);
```

semi thresholding returns the thresh_otsu which helps to find the valuable thresholding value

```
}
```

images:





2.

Disadvantages:

The pixel value which near the threshold will be replaced by the threshold value. So the values around the threshold may be a wrong value.

3.

When the adaptive threshold is useful?

When the threshold is a dynamic suitable value, the threshold is useful.