

Lab 4. Task 1- preparation task

Template for answers

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Student names and LiU-IDs: (Max 2 students per group):

1. Magnus Kling (magkl572)

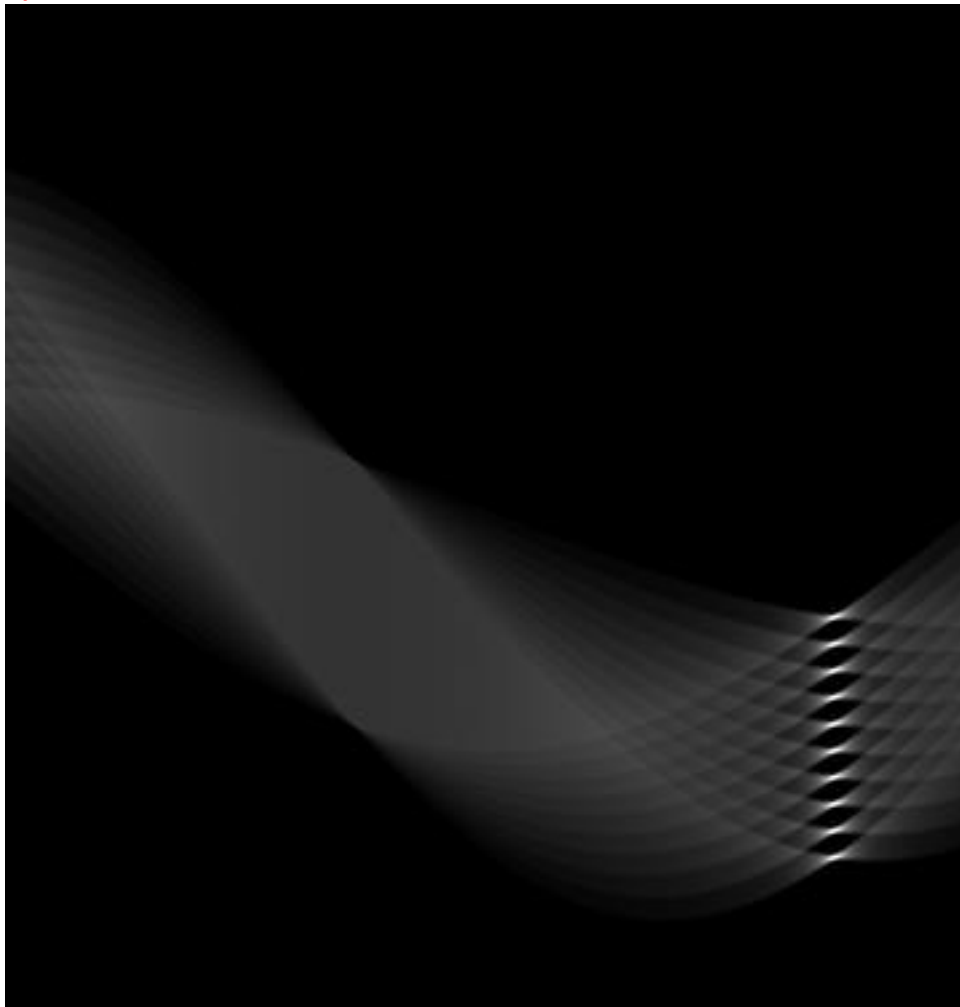
2. Max Wiklundh (maxwi824)

Submission date: 2023-12-11

Version (in case you need to re-submit):

1) Hough transform

1) H1:



2) Your guess:

The x values of the intersections are at around 310, which with the values from θ give an angle of 64.5 degrees clockwise from the original image.

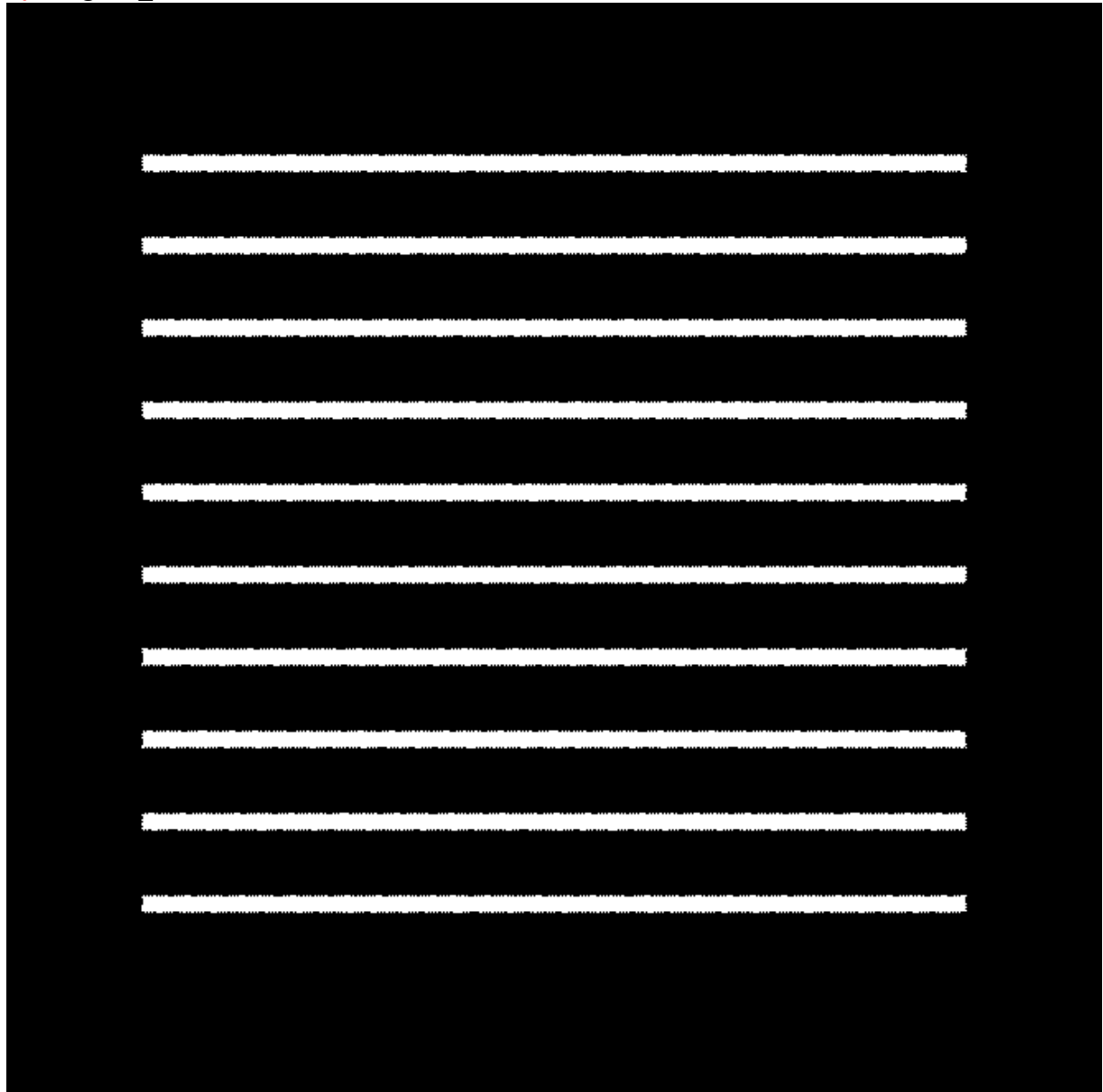
3) What is the exact angle corresponding to the lines in *Image1a*?

The exact angle is 65 degrees.

4) What is the angle of **clockwise** rotation to rotate *Image1a* to the horizontal level? Use your answer from problem 3.

We need to rotate 25 degrees clockwise $\Rightarrow 65 - 90 = -25$ degrees.

5) *Image1a_rotated*:



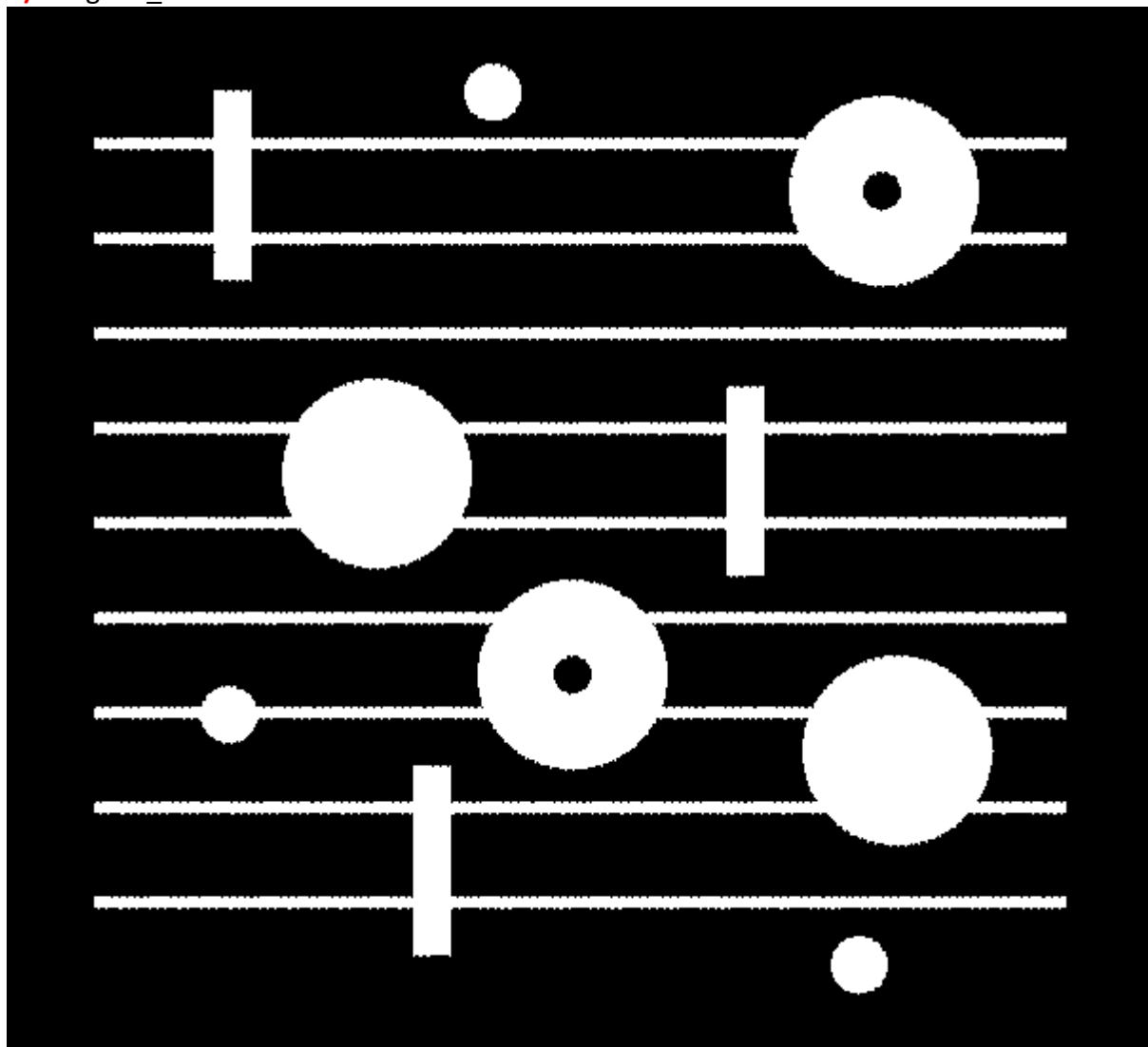
6) What is the exact angle corresponding to the straight lines in *Image1b*?

The angle is -75 degrees.

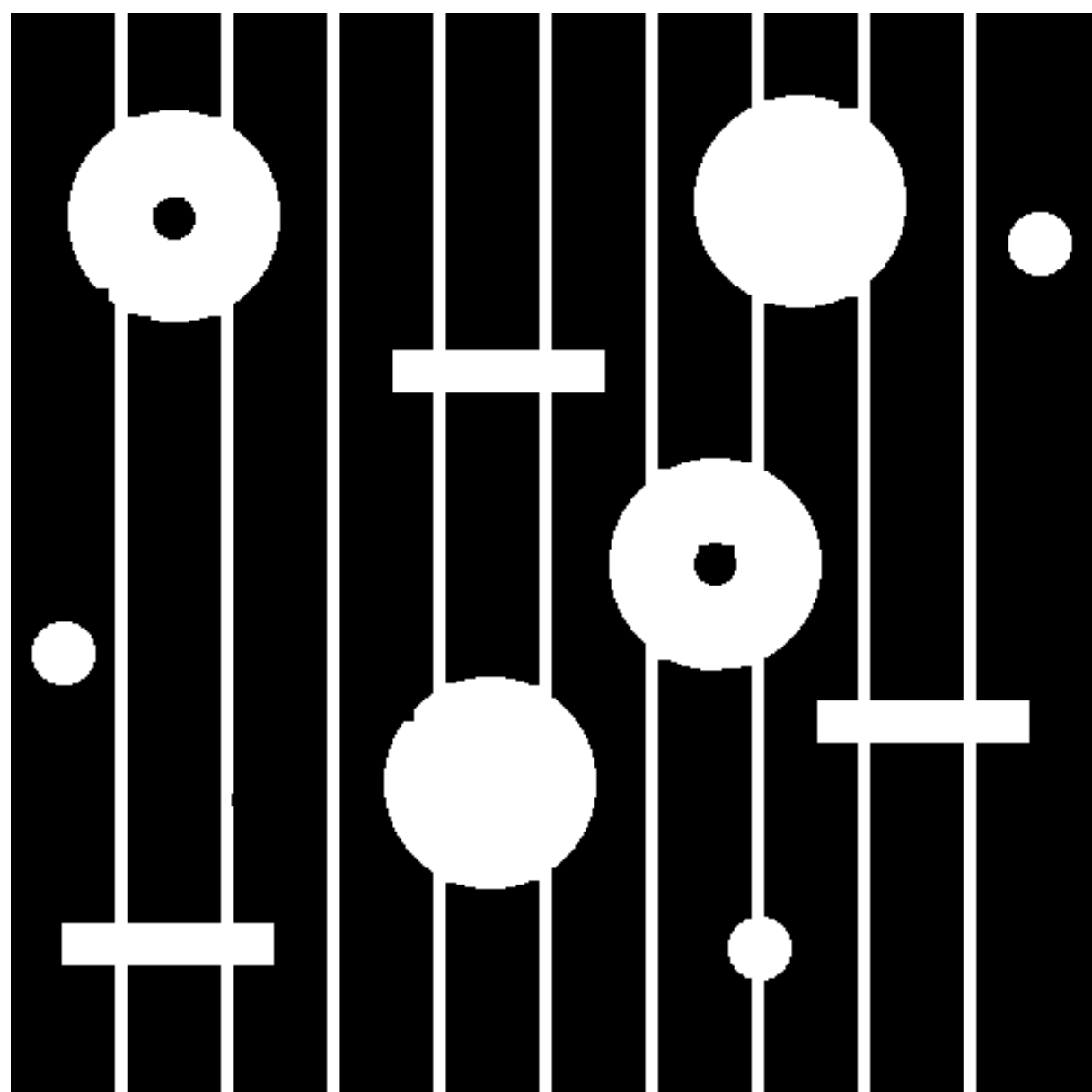
7) What is the angle of **counterclockwise** rotation to rotate *Image1b* to horizontal level? Use your answer from problem 6.

$-75 + 90 = 15$ degrees counterclockwise to get image1b to horizontal level.

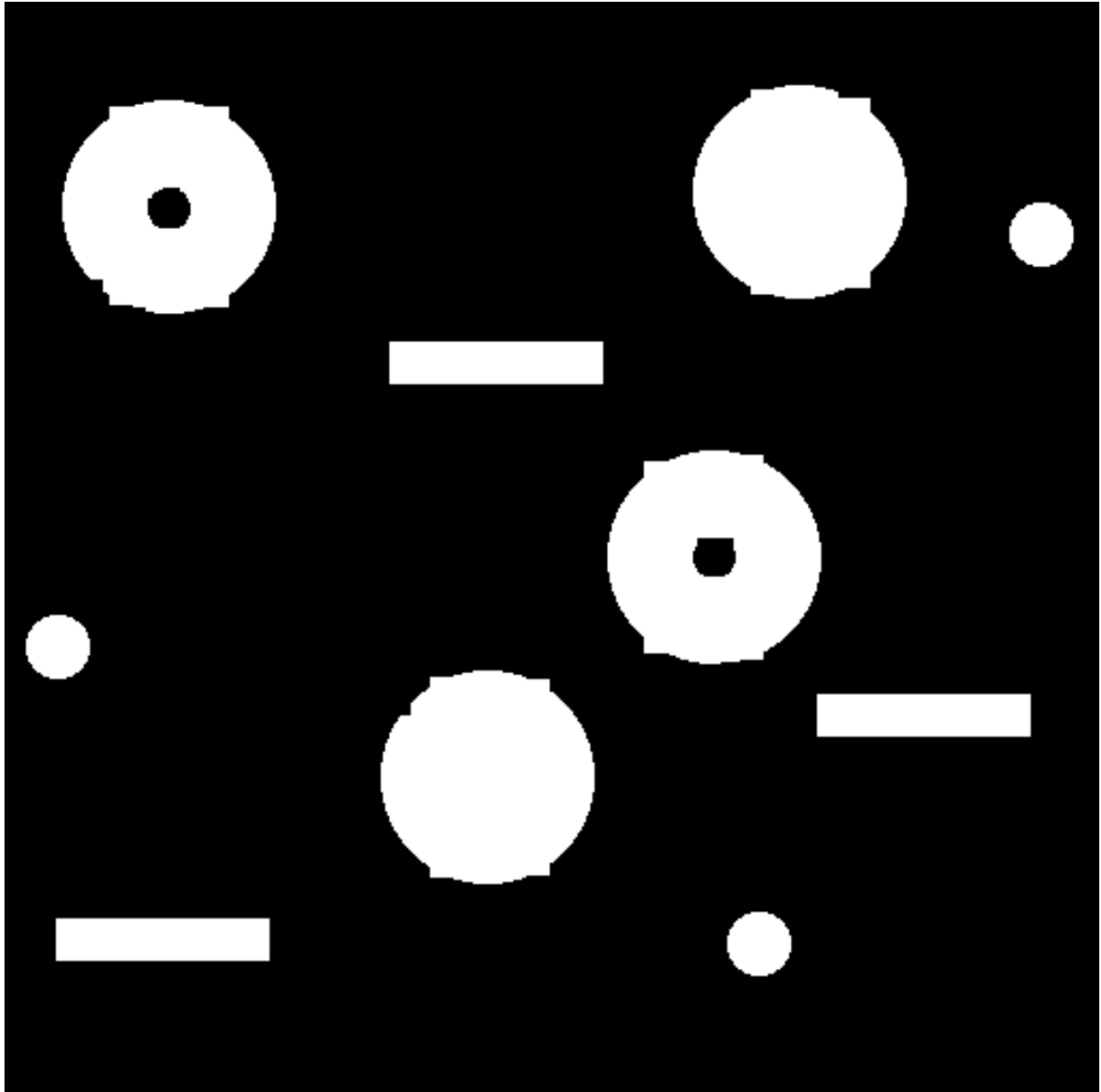
8) Image1b_rotated:



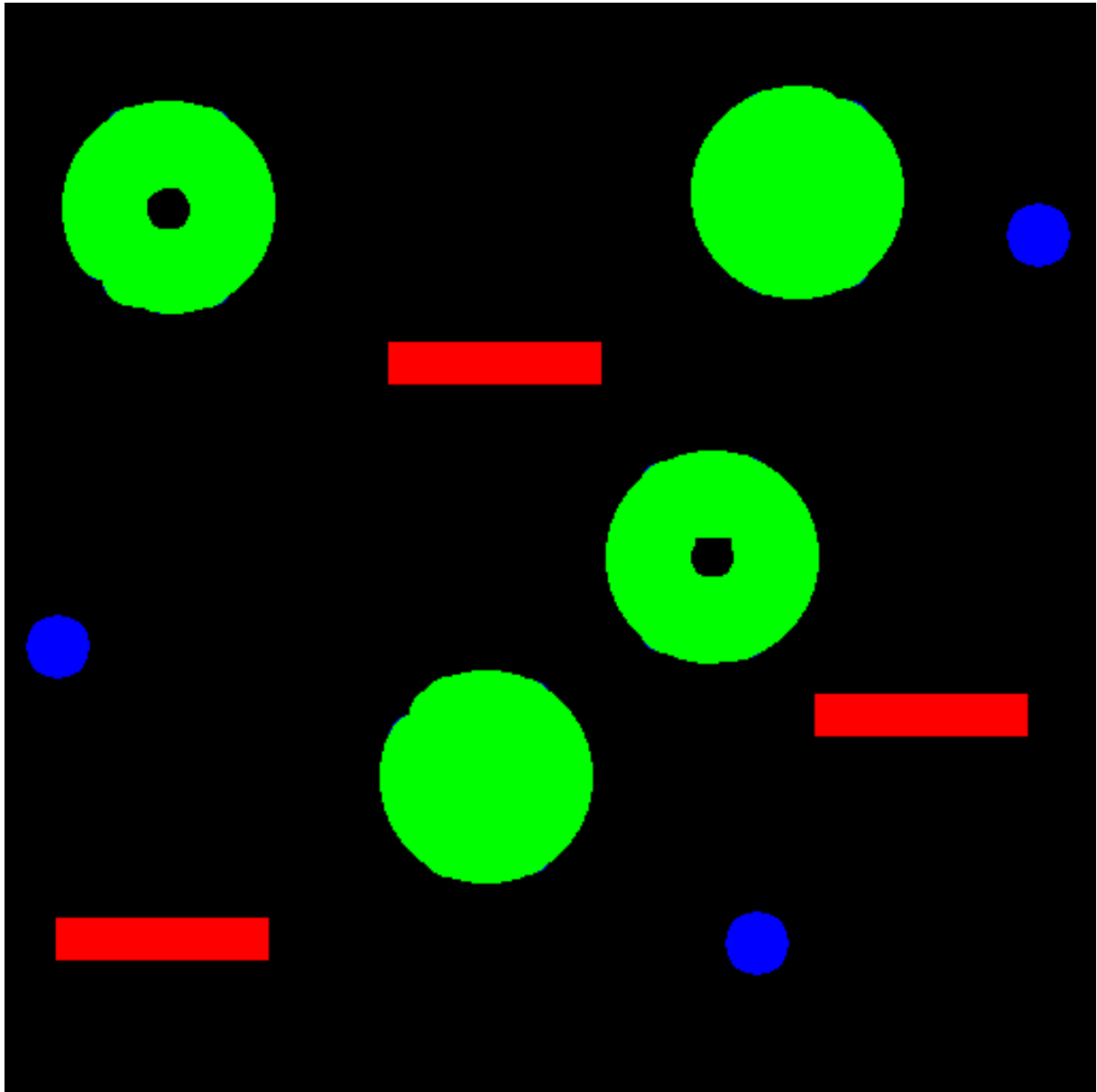
9) Image1c with noise removed:



10) Image1c_clean (noise and lines removed):

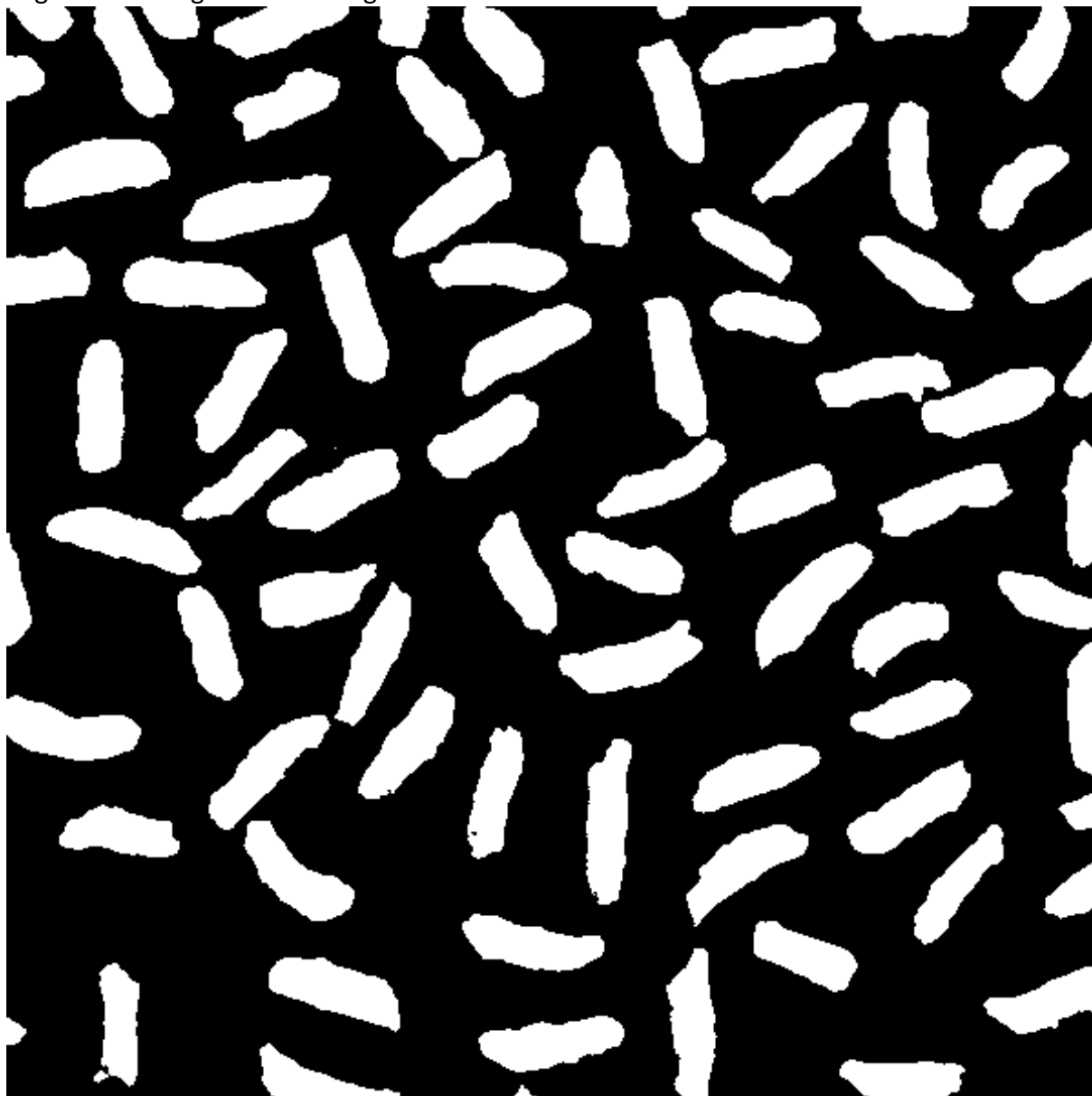


11) RGB-image displaying the 3 different classes of objects in different colors:

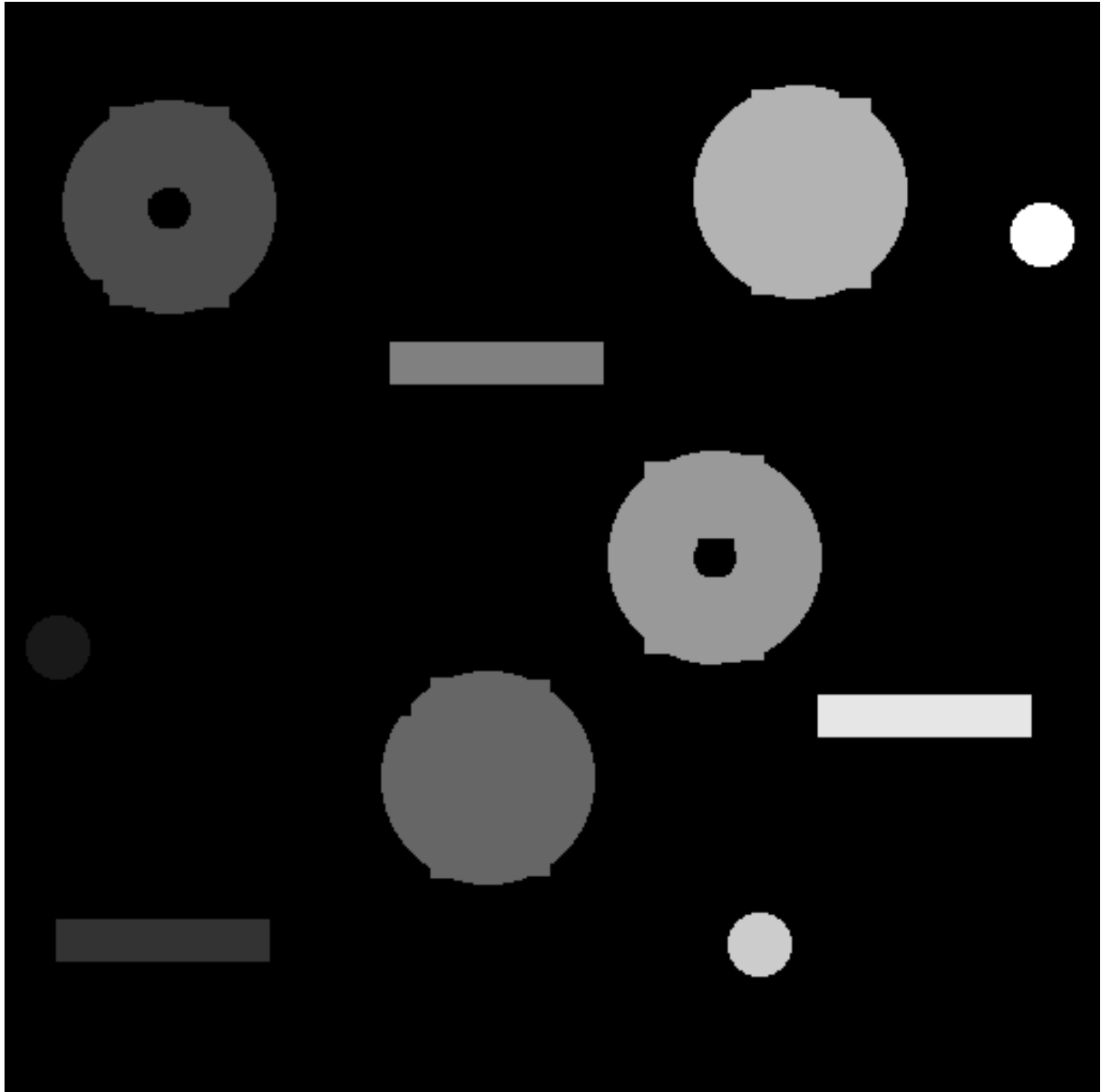


12) Your structuring element: `SE = strel('disk', 40);`

Segmented image with all the grains of rice:



13) Labeled image, L, scaled by max value:

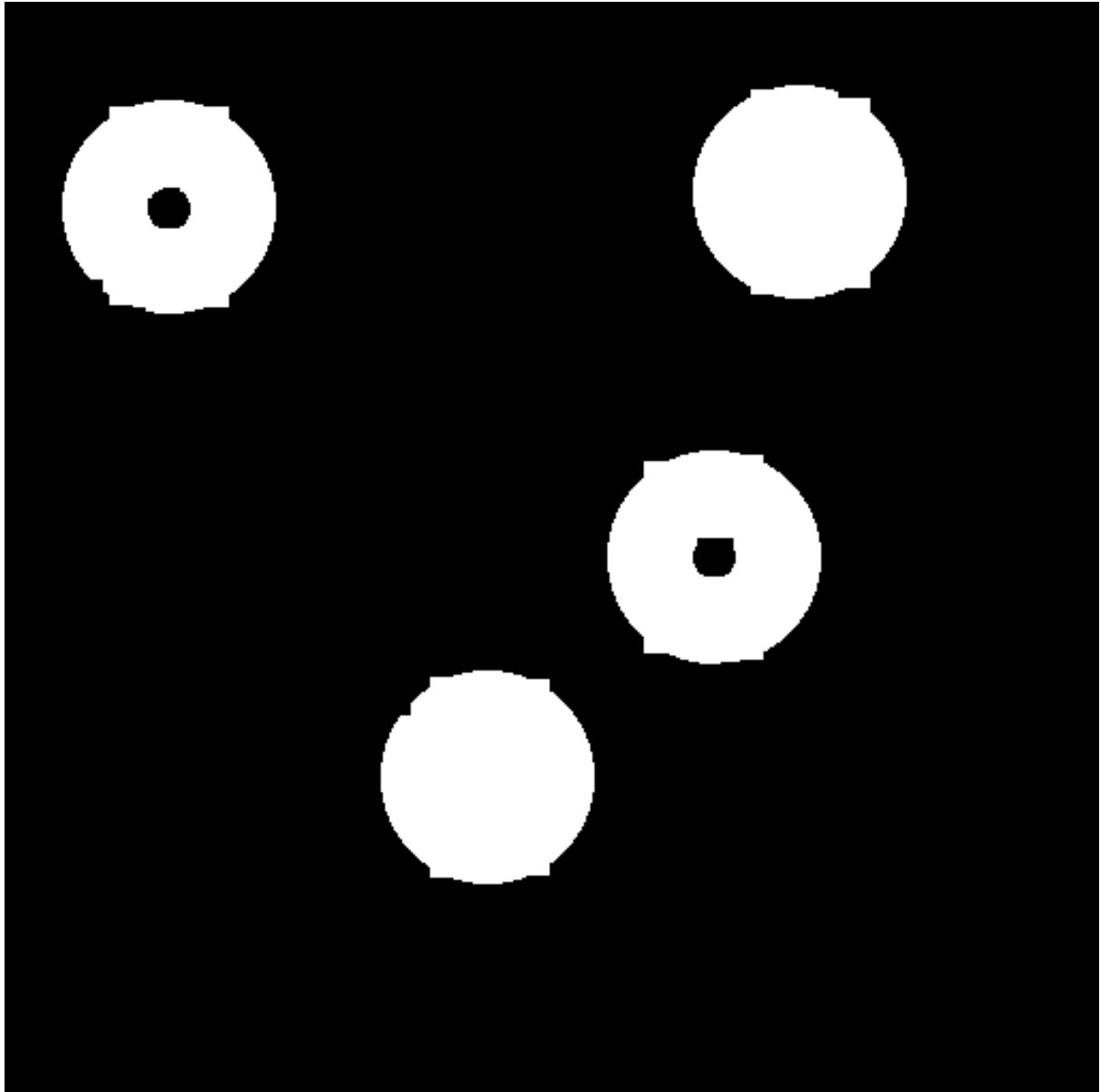


14) What are the perimeters for the large objects (having area > 3000 pixels)?

ans =

327.4740 325.6300 324.3400 324.9850

Image containing only the large objects:



15) What is your selected threshold value?

We chose a threshold value of 150, since it was between the spikes around 100 and 200

What are the labels of the objects belonging to the class with the smallest perimeter?

```
SmallO =  
  
    1      8      10  
  
Perimeter1 =  
  
    92.3120    92.3120    92.3120
```

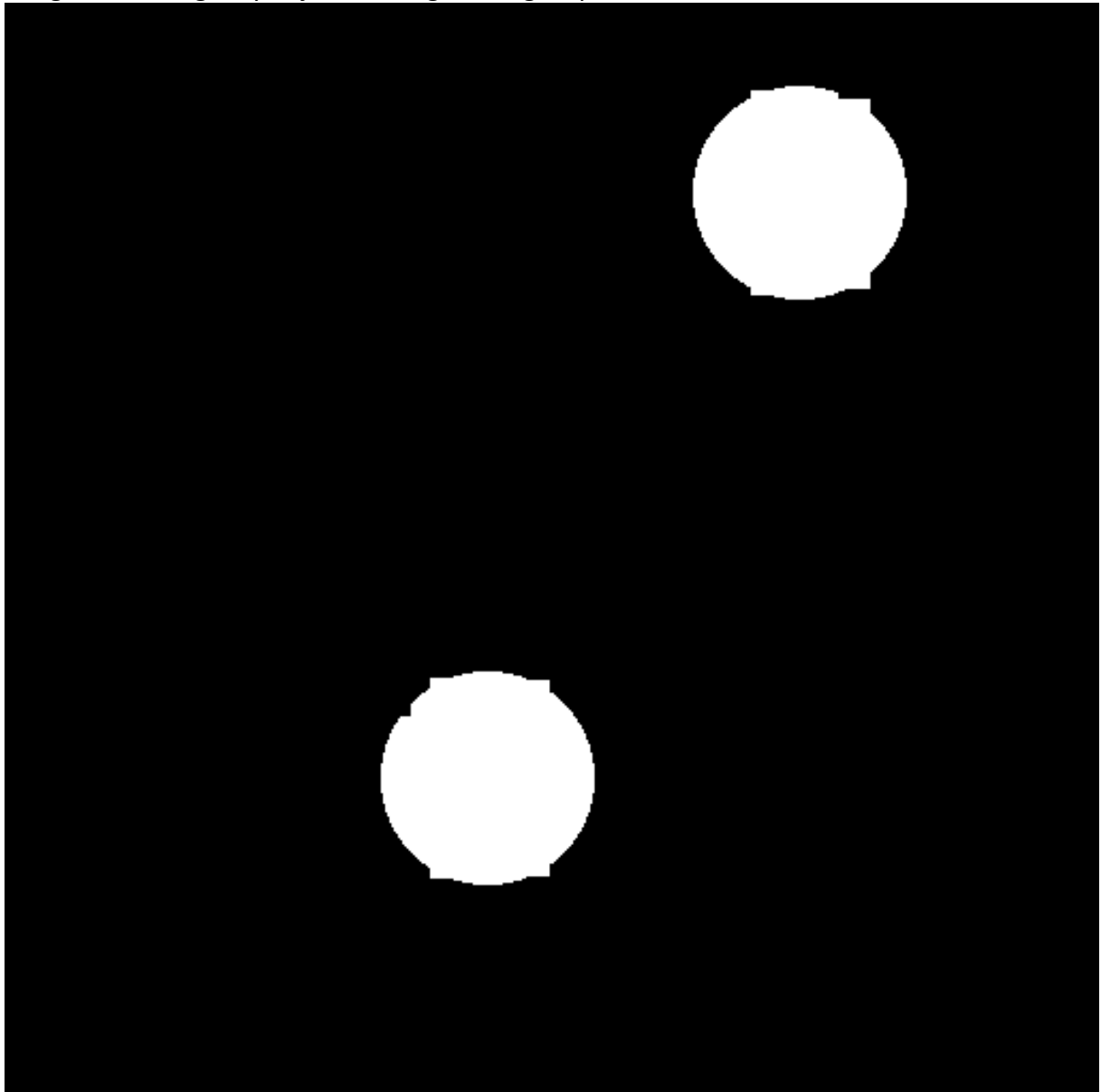
16) What are the labels of the objects belonging to the class with the largest perimeter, and that has no holes?

The labels of the objects with the largest perimeter are 4 % 7

Objects =

4 7

Image containing only objects having the largest perimeter, without holes:



*Don't forget to save the document as **.pdf** before submitting!*