EE 569: Morphological Image Processing Exercises

Exercise 1: Object Counting

Please apply the 'shrinking' filter to the squares image (squares.raw). Please implement the filter, and discuss your solution for the following questions:

- Count the total number of squares in the image.
- How many different square sizes are present in the image? What is the frequency of these square sizes? (Hint: Plot the histogram of the square size with respect to frequency.)

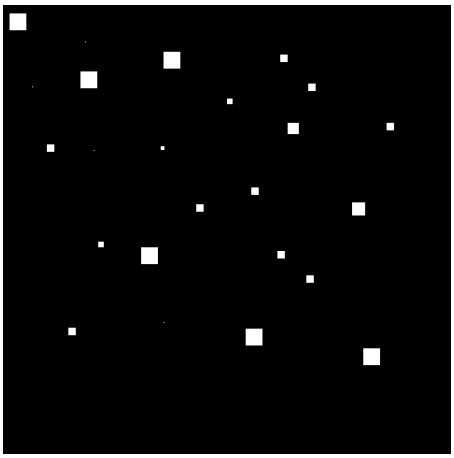

Figure 1: squares.raw

Exercise 2: Complex Object Counting

Figure 2 (see below) is target image with circle and square objects (the background is black and the objects are white). Some of these objects have one or more holes in them. You need to design an algorithm that uses morphological and logical operations to solve and answer the questions below. You may use any of these operators that you learned in class or ones that you invent, but all of them must be detailed in your report with respect to how they operate and how their results help you solve the problem. In your report, discuss your algorithm, results, and analysis in detail.

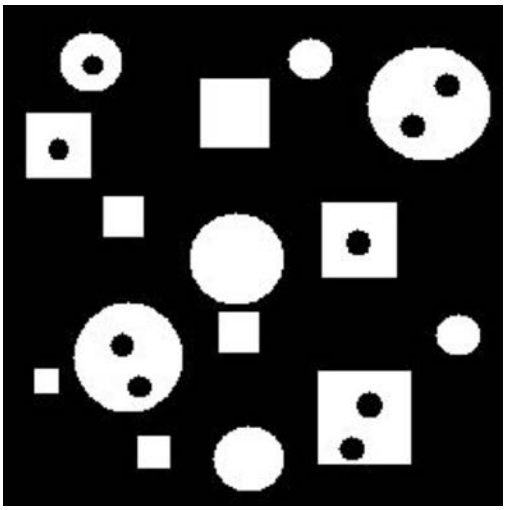

Figure 2: board.raw

- Find the total number of white objects in the image
- Find the total number of holes (black circular holes within white objects) in the image.
- Find the total number of white square objects (with or without holes) in the image.
- Find the total number of white circle objects (with or without holes) in the image.

Note: Manual counting of objects is not permitted; your code must automatically do this.