**Name:**

**Advanced Programming in Java**

**Lab Exercise 1.5.2022**

1. You work for the Jet Propulsion Laboratory. You need to write a program that will take an array containing the digitized representation of a picture of the night sky and locate the stars on it. Each element of the array represents the light hitting that portion of the image when the picture was taken. Intensities range from 0 to 20.

A star is probably located in the area covered by the array element i, j if the following is the case:

(A[i][j] + sum of 4 surrounding intensities) / 5 > 6.0

Ignore possible stars along the edges of the array.

A sample input:

0 3 4 0 0 0 6 8

5 13 6 0 0 0 2 3

2 6 2 7 3 0 10 0

0 0 4 15 4 1 6 0

0 0 7 12 6 9 10 4

5 0 6 10 6 4 8 0

0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0

Sample output:

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1. In math and science as you may know, vectors such as force and velocity contain two properties; magnitude and direction. These are commonly represented in one of two forms;

rectangular (x, y) and polar (r∠θ).

1. Write a function that will convert rectangular to polar
2. Write a function that will convert polar to rectangular

Hint: Consider designing classes for this purpose.