# HW3

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Do the non-recursive analysis for the following ImageThreshold() function, a sum, to get a function f(n) describing the number of basic operations the function makes during a call.
   1. (5) What is the Basic Operation?
   2. (5) What is the input Size? (it is okay if it has multiple dimensions)
   3. (30) Now, translate the function to a sum and reduce the sum to its simplest form (no sums remaining)

**ImageThreshold(A[m][n], B[m][n], thresh){**

**for i = 0..m-1**

**for j = 0..n-1**

**if(A[i][j] >= thresh) B[i][j] = 1**

**else B[i][j] = 0**

**}**

2) (15)Using any appropriate method or definition, find the big-ϴ class of your function.

3) (15) Represent the following adjacency matrix as a (drawn) graph:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A | B | C | D | E |
| A | 0 | 1 | 1 | 1 | 0 |
| B | 1 | 1 | 0 | 0 | 0 |
| C | 1 | 0 | 0 | 0 | 1 |
| D | 1 | 0 | 1 | 0 | 1 |
| E | 0 | 1 | 0 | 1 | 0 |

4) (5) Which nodes have (self) loops?

5) (10) Can the graph be an undirected graph? Explain.

6) (15) Represent the above graph in the adjacency list form.