Kramer Johnson

CPSC 5031\_02

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Homework 2

6.

a. The algorithm determines if a matrix is symmetrical (mirror image I think would be the term) on either side of its diagonal axis (top left to bottom right).

b. The basic operation is checking for equality in the if statement.

c. The operation is executed n(n – 1) / 2 times in the worst case. In the best case, once.

d. The efficiency class of the algorithm is O(n^2)

3.

a. S(n) = S(n – 1) + 2 for n > 1

S(1) = 1

S(n – 1) = [S(n – 2 + 2)] + 2 = S(n – 2) + 4 =

S(n – 2) + 4 = [S(n – 3) + 2] + 4 = S(n – 3) + 6 =

S(n – i) + 2i = S(n – (n – 1)) + 2(n – 1) = S(1) + 2n – 1 = 1 + 2n – 1 = **2n**

**The basic operation is executed 2n times which is O(n).**

b. The non-recursive algorithm for this function will also have a O(n) runtime but will use less space on the stack.