CSE548 Quiz 2017-09-04

1. Explain why the statement, " The running time of algorithm A is at lease $O(n^2)$," is meaningless.

2. Is $2^{n+1} = O(2^n)$?

3. What value is returned by the following function? Express your answer as a function of n. Give the worst-case running time using Big Oh notation.

function somenum(n)
  r:=0
  for i:=1 to n-1 do
    for j:=i+1 to n do
      for k:=1 to j do
        r:=r+1
  return(r)

For a geometric sequence with first term $a_1 = a$ and common ratio r, the sum of the first n terms is given by:

$$\sum_{i=1}^{n} a_i = a \left(\frac{1-r^n}{1-r} \right)$$

4. What is the algorithmic topic of chapter 4 called: divining and solving problems to smaller instances and merging the solutions?

_____

5. _____ is an equation or inequality that describes a function in terms of its value on smaller input.

In Class Problems

1. Is $2^{2n} = O(2^n)$? Proof by contradiction