COMP 2310 DATA STRUCTURES AND ALGORITHMS :Assignment-1

Name&ID: October 03,2022

1. Order the following functions by growth rate:
   1. 3n
   2. *n*
   3. n2

d. 12/*n*

e. n1.9

f. n log n2

g. 2n

h . 2n/2

i . n2log n

j. n3

2.What are Big-O expressions for the following runtine functions?

a) T(n)= nlog n + n log (n3 )

b) T(n)= (nnn)2

c) T(n)= n1/3 + n1/4 + log n

d) T(n)= 23n + 32n

e) T(n)= n! + 2n

3. For each of the following six program fragments:

Give an analysis of the running time (Big-O will do).

1. s = 0;

for (i = 0; i < n; i++)

s++;

**(2)** s = 0;

for (i = 0; i < m; i++)

for (j = 0; j < n; j++)

s++;

**(3)** s = 0;

for (i = 0; i < m; i++)

for (j = 0; j < m\*m; j++)

s++;

**(4)** s = 0;

for (i = 0; i < m; i++)

for (j = 0; j < i; j++)

s++;

**(5)** s = 0;

for (i = 0; i < m; i++)

for (j = 0; j < i\*i; j++)

for (k = 0; k < j; k++)

s++;

4. Write algorithm and program : Find the sum of the integers from 1 through n.

a)Use iterative algorithm and program

b) Use recursive algorithm and program.