CS224 Assignment 1 <https://www.youtube.com/watch?v=8syQKTdgdzc>

Attention: You can only access the Assignment 1 (quiz) one-time from the Canvas. So, please download CS224\_Assignment1 file from Canvas Week 2 Module and figure out the answer keys and submit your answer-keys onto the CS224 Canvas by clicking Assignment1 link from Canvas before 11:30 PM on 09/04.

1. What is the order of the following growth function? t(n)= 5nlog n + 20n - 4

A. O(1) B. O(log n) C. O(n) D. O(n log n)

2. The following code segment has \_\_\_\_\_\_ time complexity?

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

for(int j = 0; j < n; j=j\*2){

int val = (j\*i);

System.out.println(val)

}

}

A. O(1) B. O(n) C. O(nlogn) D. O(n2)

3. Which Growth function has the highest order?

A. O(n log n) B. O(2n) C. O(n2) D. O(log n)

4. What is the time complexity of the following loop?

for (int count = 0; count = <n; count ++)

{

for (int count2 = 0; count2 < n; count2++)

{

}

}

A. O(n2) B. O(n3) C. O(n) D. O(2n)

5. Which of the following has the smallest time complexity?

* 1. O(3n+5+2n)
  2. O(logn + 2)
  3. O(3n+4)
  4. O(n logn)

6. Software must make efficient use of resources such as \_\_\_\_\_\_\_ and \_\_\_\_\_\_ .

1. Hard Drive, Video Card
2. CPU time, Memory
3. CPU time, Video Card
4. Memory, Hard Drive

7. If the algorithm is inefficient, a faster processor will help.

A. True B. False C. None of correct D. Processor is much faster than before

8. The analysis of nested loops must take into account both the\_\_\_\_\_

A. if and for statement. B. <inner and outer Loops>.

C. i++ and j++ increased D. CPU and RAM takes

9. Determine the growth function and order of the following code fragment:

for (int count = 0; count < n; count ++)

{

for (int count2 = 0; count2 < n; count2 = count2 \* 2)

{

System.out.println(count, count2);

}

}

A. n logo(n). B. O(n logn) C. O(n+n) D. O(n2)

10. The order of an algorithm refers to the \_\_\_\_\_\_\_\_\_\_of the algorithm’s growth function.

A. <How many loops> B. <asymptotic complexity>

C. <How control variables grows> D. <software efficient>

11. What is the runtime of the below code?

void foo(int[] array) {

int sum = 0;

int product = 1;

for (inti= 0; i < array.length; i{++)

sum += array[i);}

for (int i= 0; i < array.length; i++) {

product\*= array[i];}

System.out.println(sum + ", " + product);

}

A. n logo(n). B. O(n logn) C. O(n) D. O(n2)

12. What is the runtime of the below code?

void printPairs(int[] array) {

for (int i= 0; i < array.length; i++) {

for (int j = 0; j < array.length; j++) {

System.out.println(array[i] + "," + array[j]);}

}

}

A. n log(n). B. O(n logn) C. O(n) D. O(n2)

13. The following code reverses an array. What is its runtime?

void reverse(int[] array) {

for (inti= 0; i <array.length/ 2; i++) {

int other= array.length - i - 1;

int temp= array[i];

array[i] = array[other];

array[other] = temp;

}

}

A. n logo(n). B. O(n logn) C. O(n) D. O(n2)

14. What is its runtime?

void printUnorderedPairs(int[] arrayA, int[] arrayB) {

int a= arrayA.length;

int b= arrayB.length;

for (int i= 0; i < a; i++) {

for (int j = 0; j < b; j++) {

if (arrayA[i] < arrayB[j]) {

System.out.println(arrayA[i] + "," + arrayB[j]);}

} } } //Close printUnorderedPairs

A. n logo(n). B. O( a \* b) C. O(n) D. O(n2)

15. The below code is to find the largest element in an unsorted array of integers. What is the time complexity of this algorithm?

int max;

if (intArray.length > 0)

{

max = intArray[0];

for (int num = 1; num < intArray.length; num++)

if (intArray[num] > max)

max = intArray[num];

System.out.println (max);

}

else

{

System.out.println ("The array is empty.");

}

A. n logo(n). B. O( a \* b) C. O(n) D. O(n2)

16. Determine the growth function and order of the following code fragment:

for (int count = 0; count < n; count ++)

{

for (int count2 = 0; count2 < n; count2 = count2 + 2)

{

System.out.println(count, count2);

}

}

A. The order is: n B. The order is: (n+1)/2

C. The order is: n logn

D. The order is: n\*((n+1)/2), whch means: order n2

`17. What is the order of the following growth functions?

10n2 + 100n + 1000

A. n log(n). B. O( 100 \* n) C. O(n) D. O(n2)

18. What is the order of the following growth functions?

2n + 100n10 + 100n3

A. *O(2n)* B. O( 100 \* n) C. O(n) D. O(n2)

19. When n = 10, which one is the Most efficient?

A. 2n + 100n3 B. 10n3 – 7 C. 10n2 + 100n + 1000

D. n2 log n

20. When n = 1,000,000, which one is the Most efficient?

A. 2n + 100n3 B. 10n3 – 7 C. 10n2 + 100n + 1000

D. n2 log n

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Thank you! Dr. Zhang