SRI RAMAJAYAM GLOBAL SENIOR SECONDARY CBSE SCHOOL

Chapter - 7 (25.06.2020)

STD: XII **TIME: 01.30 Hrs**

SUBJECT: COMPUTER SCIENCE **TOTAL MARKS: 50**

Idea of Algorithmic Efficiency

I. Multiple Choice Questions **10x1=10**

1. An input that results in the shortest execution time is called the _____

(a) best-case input (b) worst-case input

(C) average-case input (d) None of these

2. For a sorted list of 1024 elements, a binary search takes at most comparison. Note that to check whether an element is greater than equal to or less than the other element is considered as one comparison here.

(a) 11 (b) 100 (c) 512 (d) 6

3. O (1) is _____?

(a) Constant time (b) logarithmic time (c) linear time (d) log-linear time

4. Algorithm efficiency is estimated to _____

(a) Determine the exact execution time

(b) Calculate the approximate execution time

(c) Determine the growth function with input size

(d) All of these

5. On the best case, linear search searches

(a) the whole list (b) half of the list

(c) Just one element in the list (d) One fourth of the list

6. On the worst case, linear search searches

(a) the whole list (b) half of the list

(c) Just one element in the list (d) One fourth of the list

7. On an average linear search searches

(a) the whole list (b) half of the list

(c) just one element in the list (d) one fourth of the list

8. Worst Case efficiency means that

(a) The highest execution time of the algorithm

(b) It tells that the algorithm will never be slower than the worst case.

(c) It estimates the worst execution time the algorithm may take

(d) None of these

9. Best Case efficiency means that

(a) The fastest possible case of the algorithm

(b) It tells that the algorithm will never be slower than the worst case.

(c) It estimates the best execution time the algorithm may take.

(d) None of these

10. Average Case efficiency means that

(a) The fastest possible case of the algorithm

(b) It tells that the algorithm will never be slower than the worst case,

(c) Most probable cases of the algorithm will perform like this

(d) None of these

II. Fill in the Blanks **5x1=5**

1. The measure of the efficiency of an algorithm is called algorithm's computational _____
2. Programs with a bigger O notation value run_____ than programs with a smaller O notation value.
3. _____term affects the most, an algorithm's performance.
4. Only the_____term is included in Big-O notation.
5. An algorithm's performance cannot be slower than its_____.

III. True/False Questions **5x1=5**

1. Best-Case Complexity gives the running time of an algorithm in case of optimal performance.

2. Worst-Case Complexity gives lower bound on running time of an algorithm.

3. Algorithmic efficiency gives exact measure of execution time.

4. Big O notation is determined after excluding the dominant term.

5. Growth function determines how an algorithm will perform with the increase in its input size.

IV. Glossary (Definition) **5x2=10**

1. Algorithm
2. Average-case complexity
3. Best-case complexity
4. Complexity
5. Worst- case complexity

V. Answer the following Questions **10X2=20**

1. Define : Algorithm.

2. Define Big "O' notation.

3. Write an Internal and External Factors of complexity of an algorithm.

4. Distinguish between worst-case and best case complexity of an algorithm.

5. Give the meaning of the following common expression in Big O notation: O(N)

6. List any two cases to analyse algorithm complexities.

7. Reorder the following efficiencies from the smallest to the largest:

(a) 2^n (b) n! (c) n^5 (d) 10000 (e) $n\log_2(n)$

8. What are different types of complexities that are considered?

9. What did you understand by algorithm performance?

10. Explain: Time, Space, Speed and Quality.

*****All the Best*****