

INTERN QUESTIONS 2010

AMAZON

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Tech:

1. Write a code to find maximum contiguous sum sequence in an array. Also find the sequence i.e. find pair(i,j) such that "sum of ar[i] .. ar[j]" is maximum in the array.
2. Explain Encapsulation, Inheritance, Polymorphism in detail with examples. Also state their advantages.
3. Explain 'cron' command in unix.
4. Write a code to implement a stack using 2 queues.Explain the time and space complexity of push() and pop() operations in your design.
5. Given an array of binary values ..(that is consists of only 0 and 1).Write a code to club all zeroes to the left and ones to the right. (expected: O(N))
6. Write code for BFS and DFS of a graph.
7. preorder traversal without any recursion
8. given an array, find top k elements in order .
9. given an array of size n+1, and containing integers from 1 to n, where only 1 integer is repeating. Find that integer.
10. Difference b/w graph and tree
11. Given an array of integers and a number x. Find whether it contains a pair such that the sum of numbers is equal to x.
12. Given a sentence like "I am xyz". Convert it to a reverse sentence like "xyz am i";
13. Given an array of size n-1 containig elements 1-n. One element is missing. Find the missing number.
14. WAP to check whether a given binary tree is BST or not.

GOLDMAN SACHS

Tech :

1. Given a string, find all its permutations. The string can have repeated characters.
2. Snake and Ladder algorithm + its implementation in OOP
3. Tic-tac-toe algorithm
4. What is a singleton class?
5. List 10 ways to find distinct tuples in a table.
6. Normalisation n real life implementation of bcnf,4nf
7. Questions on ER models
8. Reverse a string by word
example: Input : "i am a gud boy."
output: boy gud a am i".
9. Check if the given string is a palindrome.
10. What do you mean by polymorphism, inheritance. Practical implementation of inheritance
11. What are the normal forms. What is outer join and inner join.
12. Questions on php scripts.
13. In a table there is a single attribute(column).It contains numbers.Some are repeated(2 or 3 and so on times) and some appears only one time. write as many queries to output all the numbers only once (apart from using distinct in sql query).
14. Difference between having,with and group by clause.

Puzzle :

1. Given 2 strings which burn completely in one hour. The rate of burning is uneven and different for both strings. How will you use it to clock 15 mins.

2. Given 8 coins, all looking alike but one of them is heavier than rest which are of same wt. Given a beam balance, how many balancing is required to find the heavier coin.

[ans. : 2]

3. There is a digital electronic weight that measures exactly. You have 10 bags. In each bag there are 10 coins. Each coin weighs 10grams except in one bag in which all the coins weigh 9grams. In how many weighing can you determine the bag.

4. There are 8 weights. 7 are equal but one lighter than the others. You have a beam balance. In how many steps you can find the lighter weight.

MICROSOFT

Tech:

1. How to check if two words are anagrams of each other.
2. Function to display the directory structure in a user friendly way taking root dir as arg for a general OS. You may assume and state some basic APIs available in that OS. (After the previous one, around 1 hour was based on the performance, memory requirements, speed, user friendliness, generality improvement of my code)
3. State as many applications of DS as you can.
4. Design a composite data structure to capture all the details of a circuit board inside an electronic device like cell phone. (Around half an hour was based on this)
5. Implement a trim function to trim all the white spaces(' ', '\t', '\n') from any where of the array (when in between leave a single space and when at the edges trim completely) inplace i.e without using extra space.
Write test cases for the above question.
6. Deletion of nth element from end of a list with all possible test cases
7. Implement atoi function, consider any and everything you can think could be the input and handle the corresponding inputs i.e. code must work at every test case.
ex : " 12345", " +123 456", " ---123", "12@45", "123.45", "123.45.67"
8. Possible test cases to check working of internet explorer
9. Difference between cut-copy-paste and move as in which of the two would be more efficient
10. Implementation of strcmp()
11. Angle difference calculation between hour and minute hands of a clock
12. What Microsoft application you use mostly and write down atleast 15 test cases for testing of it. Test cases must be appropriate and they shouldn't be redundant.
13. Find cycle in a linked list and find out the cycle point.
14. Reverse a linked list recursively using one pointer.
some other questions on linked list such as nth node from end, delete a pointed node in $O(1)$ in singly linked list etc.

15. Write down the c code for finding out the maximum scope depth in a c code. A scope depth is increased by one with every '{' and decreases by one with every '}' .

16. Write down the c code for finding out the frequency of occurrence of each scope depth along with the inclusion of error checking code (wrt unbalanced braces).

17. Write a function to delete Nth node in a given Single Link list. Give test cases to test your function.

18. Write a function which take a string (containing a paragraph) and convert the string in the format in which first char of first word of each sentence is only Uppercase and rest are in lowercase.

Example - input string: "hi how Are yoU. i?. yes, You."

output: "Hi how are you. I ?. Yes,you."

Dont use any extra space you hav to do it in place. Give test cases to test your function.

19. How will you Test the communication system of a mobile?.Give test cases.

20. Hou will You test break System of a car ?. give test cases.

21. How will you test An aeroplane Engine? . give test cases.

22. Write a Function which shift(Circular left) the bits of a given int by d position ($0 \leq d < 32$.)

23. You are Given a $m*n$ matrix containing integers which is sorted rowwise as well as columnwise

means $arr[0][0]$ is lowest and $arr[m-1][n-1]$ is largest. How will you search a given element in this given 2 D matrix .(Hint: modified binary search).

24. Integer number is representing as a Single Link List (Each node contains one digit)

num1: 1342 L1. 1->3->4->2

num2: -423 L2. -->4->2->3

Write a function which will take two link lists representation two nos and return a linklist representing $num=num1-num2$

25(a). Cross merging of two single linklist . dont use extra space . Give iterative and recursive code.

example.

L1: 1->2->3->4

l2: 11->12->13->14->15

output: 1->11->2->12->3->13->4->14->15

(b). Give test cases to test your function

QUALCOMM

Tech:

1. merging two unsorted linked list into a sorted linked list
2. how to make Xor gate from nand gate and vice-versa.
3. finding number of set bits in a number.
4. What is interrupt?. Give a real life example ? Why are interrupts needed ?
5. Find the position of rightmost set bit in a given int.
6. Turnoff rightmost set bit in a given int
7. Write a function which take two Single linklist as arguments one sorted and another not sorted. Merge these linkedlist into one so that resulting linklist a sorted. don't use extra space.
8. What is DMA ? why is it needed ?
9. What is Cache memory ? How does it work ?
10. Reverse a string in place .
11. Addition of two numbers without + operator