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1. TCS Technical round

There are two components of technical questions. MCQ's and Programming.

MCQ (or) Fill in the blanks

20 Minutes

10 Questions

Technical Fill in the blanks carry NO negative marks.

Multiple choice technical questions carry negative marks.

Coding round

20 Minutes

2019 Pattern - Coding platform – Instructions

1. **Coding Section to use Eclipse Oxygen Platform this year**
2. **5 programming languages will be supported this year (C, C++, Java, Phython, Perl)**
3. **Command Line Arguments will not be used this year**
4. **Input should be read from STDIN and Output to be written to STDOUT.**
5. **Hidden Test Case approach to be followed from this year**
6. **Custom Input tags will not be supported in the new platform**
7. **Programs to be slightly complex compared to last year**

Set 1 - Programs

1. Write a C program, to find the area of a circle when the diameter is given. The input diameter is an integer and the output area should be a floating point variable with 2 point precision.

2. Write a c program, to check whether the given tear is a **leap year** or not. A leap year is a calendar year containing one additional day(Feb 29th)added to keep the calendar year synchronized with the astronomical year.

3. Write a C program to find the GCD of the given 2 numbers. The input is 2 integer and the output GCD also should be an integer value.

4. Write a C program which will check whether a given year YYYY is a leap yer. A leap year is exactly divisible by 4 except for century years(years ending with 00). The century year is a leap year only if its perfectly divisible by 400. If the given year is not a leap year, then print NO to stdout. Note that the words YES and NO have to be printed in UPPERCASR(capital letters) Other than the word YES or NO, no other extra information shoul be printed to stdout.
   EXAMPLE :
   Given input "1990", here YYYY is 1990, expected output is NO

5. Factorial program in C.
   Factorial of a non-negative integer , denoted by n1, is the product of all positive integers less than or equal to n.
   For example, The value of 5! Is 5*4*3*2*1=120

6. C program question to find **hypotenuse** of a right angle triangle when the other 2 sides are given.

7. Write a C program to calculate the factorial of a non negative integer N. The **factorial** of a number N is defined as the product of all integers from 1 up to N. Factorial of 0 is defined to be 1. The number N is a non negative integer that will be passed to the program. Write the output to stdout formatted as an integer WITHOUT any other additional text. You may assume that the input integer will be such that the output will not exceed the largest possible integer that can be stored in an int type variable.

8. Write a C program to find the **area of a triangle** given the base and the corresponding height. The values base and height are both positive integers passed to the program as the first and second parameters respectively. Write the output to stdout formatted as a floating point number rounded to EXACTLY 2 decimal precision WITHOUT any other additional text. Scientific format(such as 1.00E+5) should NOT be used while printing the output. You may assume that the inputs will be such that the output will not exceed the largest possible real number that can be stored in a float type variable.

9. Write a C program that will find the sum of all **prime no**. in a given range. The range will be specified as parameters. The first parameter, N1 which is a positive integer, will contain the lower bound of the range. The second parameter N2, which is also a positive integer, will contain the upper bound of the range. The program should consider all the prime no. within the range, excluding the upper and lower bound in the output in integer format to stdout. Other than the integer number ,no other extra information should be printed to stdout. Other than the integer number ,no other extra information should be printed to stdout
Example: input "7" and "24", here N1=7 and N2=34, expected output is 83

10. Write a C program which will convert a given **binary number N to its decimal equivalent**. The given binary number N will be passed to the program using the first parameter. Print the equivalent decimal number to stdout in integer format. Otherwise the decimal number, no other extra information should be printed to stdout.
Example : Given input "111001", here N=111001, expected output 57

11. Write a C program which will check a given number N is a **palindrome**. An integer is a palindrome if the reverse number equal to the original number. The given number N will be positive 5digit number and will be passed to the program using the final parameter. If the given number is a palindrome, then print the word YES to stdout. If the given number is not a palindrome, then print NO as stdout. Note that the words YES/NO have to be in UPPERCASE (capital letters). Other than the words YES or NO, no other extra information should be printed to stdout.
Example: Given input 53435.here N=53435.expected out is YES if it is palindrome.
Write your code?

12. Check if input string is palindrome or not

13. Program: U need to get a input number from user then check whether the no. is **prime no**. or not ...if it is prime no. need print the square root of a no. else print 0.00. eg 7 means the op is 2.65.

14. Given the diameter of a circle find the area of the circle.
15. Print Fibonacci series upto N terms
16. Write a code for finding n! (calculate the factorial of a number)
17. addition of two numbers and converting the result to binary
18. Find if a given year is a leap year.
19. Printing reverse for digits. Float values, you need to round up
20. string reversal(digits and char)
21. reverse of a string program in c without using string functions.
22. sum of odd numbers in between the range of two numbers (7 to 24).
23. Check if input number is a perfect number or not.
24. binary to decimal
25. 5 Factorial (In the factorial one there was 1 private test case that is (0! is 1) then the compiler goes on and calculates for 3 Public Cases (3!=6, 4! = 24, 5! = 120) as soon as it gets those result.)
26. Armstrong Number
27. Temperature coversion
28. Find weather the given number is prime or not. If prime then print its square root if not then print 0.00
29. String compare without using strcmp
30. Largest or second largest number in N INPUT numbers
31. GCD of two nos
32. LC of two nos
33. AREA OF A TRIANGLE-given a,b,c
34. SORT AN ARRAY INTO TWO HALVES, ONE HALF ASCENDING AND SECOND HALF DESCENDING
35. SQUARE ROOT WITHOUT SQRT.H
36. Binary to ctal
37. Octal to binary
38. Area of circle – given radius
39. Nth Fibonacci Number
40. Decimal to octal

Set 2 – Programs

1) Test whether an input string of opening and closing parentheses was balanced or not. If yes , return the no. of parentheses. If no, return -1.

Ip: “(( ))”
Op: 2

Ip: “()(“
Op:-1

2) Reverse the second half of an input linked list. If the input linked list contained odd number of elements , consider the middlemost element too in the second half.

3) Write a program to Merge sort using pointers

4) Merge two sorted singly linked lists into one sorted list

5) Reverse a linked list using recursion and without recursion

6) Removal of vowel from string

7) Print and count all the numbers which are less than a given key element from a given array.

8) Eliminate repeated letters in Array. Printing non repeating elements in array and printing the total.
Arr1 = {1,2,3,4,5} Len1 = 5
Arr 2 = {2,6,8,10} Len2 = 4
Output = {1,3,4,5,6,8,10} Total is 7

9) String Reversal

10) Find a target value in a two-dimensional matrix given the number of rows as rowCount and number of columns as columnCount, and return its coordinates. If the value didn't exist, the program had to return (-1,-1).

11) Input: num1 and num2 such that 0 <= num1 <= 99999999 and 0 <= num2 <= 9. You have to find number of occurences of input num2 in input num1 and return it with function int isOccured(int num1, int num2).

Example:

Input: num1= 199294, num2= 0

Output: 3

Test Case 1:

Input:

1222212

2

Expected Output:

5

Test Case 2:

Input:

1001010

0

Expected Output:

4

12) Find a sub string in a given string and replace it with another string?
13) Remove all the vowels from a given string using pointers concept
Ip: {a,b,c,d,e,f,g,h,I,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z}
Op:
Need to use function call, return value to main function, Pass it as argument

14) Program to check for prime number:

15) To find GCD of two number.

16) Find the GCD of N numbers using pointers

17) Print all the prime numbers which are below the given number separated by comma.
Input: 3
Output: 2,3

Ip: 11
Output: 2,3,5,7

18) C program to find out prime factors of given number

19) C Program to Display Prime Numbers between Two Intervals

20) C Program to Display Armstrong Number Between Two Intervals

21) Write a function to return a sorted array after merging two unsorted arrays, the parameters will be two integer pointers for referencing arrays and two int variable, the length of arrays (Hint: use malloc() to allocate memory for 3rd array):

22) Get an unsorted array and convert into alternate array(alternate array-ascending order array by taking alternate elements).Half elements of array in ascending remaining half in descending.The first n elements should be sorted in ascending order and the next part should be sorted in descending and print it

Test Case Input: [1,2,3,4,5,6,7,8],8,4
Output: {1,2,3,4,8,7,6,5}
Function: fn_name(input array, length of array, no of digits to sort (here 3))
Fn_name(input array, 8,4)

23) Given 5,1,4,7,9....do alternate sort (odd position sorting) for this..and print 4,5,9

24) Find the occurance of a substring in a parent string
Input : aAbcDefabcAdf
Substring : abc
Output : 1

25) Write a program to rotate a matrix in 90 degree.

Case 1: Flag = 1
Input: 2 3 1
4 6 3
5 4 2

Output: 5 4 2
4 6 3
2 3 1

Case 2: Flag = 0
Input: 2 1
3 4

Output: 4 1
3 2

26) Matrix Transposition
Input
1 2 3
4 6 7
8 9 11

Output
8 4 1
9 6 2
11 7 3

Input:
1 2 3
4 5 6
7 8 9

Output:
1 4 7
2 5 8
3 6 9

27) Transpose the given matrix, multiply it with the given matrix and print the transpose of the result.

28) Pattern Printing
Input: n=3
3 3 3
3 1 3
3 2 3
3 3 3
Input: n=4
4 4 4 4
4 4 1 4
4 4 2 4
4 4 3 4

29) Write a program to print numbers in the order of their frequency of occurance.
Ip: {1,1,2,2,2,3,4,4,5,5,5,5,5}. Length - 13
Op: {5,5,5,5,5,2,2,2,1,1,4,4,3}
Given Function: int *fn_name(int *arr, int length of array}

30) Write a program to print numbers in the order of their frequency of occurance.
Ip: {1,22,333,44,5555,7,8,9,10}. Length - 10
Op: {5555,333,22,44,1,7,8,10}
Given Function: int *fn_name(int *arr, int length of array}
Use malloc() function to get the array

31) Program to rotate a given string. If 2 strings are equal then print 1 else print -1. Given 2 strings.
Ip: sample
Mplesa
Op: 1

Ip: sample
Mplase
Op:-1

Ip: abc
cba
Op: 1

Ip: ab
Aa
Op: -1

32) Write a program to print the not common numbers in both the arrays.
Input: Arr1 = {1,2,3,4}
Arr2= {4,5,6,7}
Length = 4
Length = 4
Output: 6

33) Write a program to remove duplicate elements in a array
Ip: {1,1,1,1,2,2,2,3,3,4,5}
Op: {1,2,3,4,}
Given Function: int *fn_name(int *arr, int length of array}
Use malloc() function to get the input array

34) Copying value to its corresponding index (swap values and index in a array).
Input: a[0] = 2; a[1] = 0; a[2] = 3; a[3] = 1; a[4] = 5; a[5] = 4;
Output: a[0] = 1; a[1] = 3; a[2] = 0; a[3] = 2; a[4] = 5; a[5] = 4;

35) Write a program to sort numbers in a array and print the numbers with alternate digits. Use malloc() to get the input array.
Ip: {4,2,5,3,7}
Op: {2,4,7}

36) Create function that passes a @-Dmatrix via a pointer like **a, number of rows, number of colums and flag value. The primary purpose of the program is to rotate the matrix of 90 degree (left or right based on the flag 0 or 1 respectively). Return the pointer that shows the altered matrix and print if in the main function.
Ip: [1,2] [3,4]
Op: [1,4] [2,3]
Flag = 0 rotate left
Flag = 1 rotate right

37) Create function that passes a @-Dmatrix via a pointer like **a, number of rows, number of colums and flag value. The primary purpose of the program is to rotate

the matrix of 90 degree (left or right based on the flag 0 or 1 respectively). Return the pointer that shows the altered matrix and print if in the main function.
Matrix m,n.
Ip: [1,2] [3,4] 2 2 0
Op: [2,4] [1,3]
Flag = 0 90 degree rotate left
Flag = 1 90 degree rotate right

38) Highest common factor or GCF

39) Pattern Question:- For n=5

```
1
3*2
4*5*6
10*9*8*7
11*12*13*14*15
```

40) Pattern Question:- For n=5

```
1
2*2
3*3*3
4*4*4*4
5*5*5*5*5
4*4*4*4
3*3*3
2*2
1
```

41) Pattern Question:-

To print the pattern like for n=3 the program should print

```
1 1 1 2
3 2 2 2
3 3 3 4
```

print n=6; n stands for number of lines

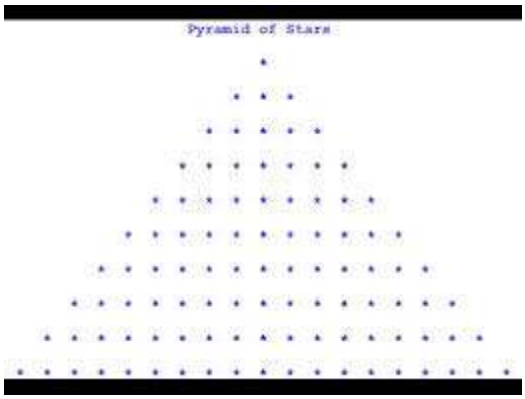
```
1111112
3222222
3333334
5444444
5555556
7666666
```

42) To print the trapezium pattern. for example , we have n=4 the output should be like

```
1*2*3*4*17*18*19*20
```

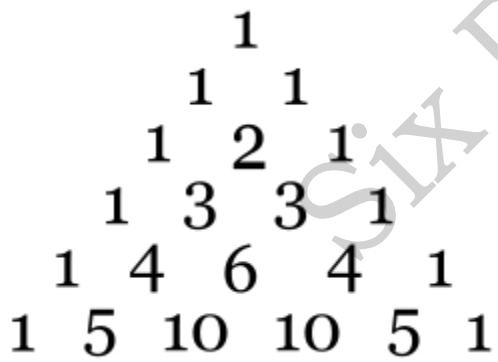
- -5*6*7*14*15*16
- - - -8*9*12*13
- - - - - -10*11

43) C program to print following pyramid pattern of stars



44) Write a c program to print Pascal triangle.

In mathematics, Pascal's triangle is a triangular array of the binomial coefficients. In much of the Western world it is named after French mathematician Blaise Pascal, although other mathematicians studied it centuries before him in India, Iran, China, Germany, and Italy.



45) 1
3*2
4*5*6
9*8*7
14*13*12*11

46) If N=4
1
2*3
3*4*5
4*5*6*7
3*4*5
2*3

1

47) Input: 4

1
2*3
4*5*6
7*8*9*10
7*8*9*10
4*5*6
2*3
1

48)

1
2 2
3 3 3
4 4 4 4

49) Get input as N, square the N and generate the number from 1 to N^2.

N=4
1*2*3*4
9*10*11*12
13*14*15*16
5*6*7*8

N=5
1*2*3*4*5
11*12*13*14*15
21*22*23*24*25
16*17*18*19*20
6*7*8*9*10

50) Obtain a output as follows:

N=5

1

2*3

4*5*6

7*8*9*10

11*12*13*14*15

11*12*13*14*15

7*8*9*10

4*5*6

2*3

1

51) Write a C program to print below, when n=4 and s=3

3
44
555
6666
6666
555
44
3