

CO101 Programming Fundamental Assignments

Dear Students,

Kindly submit the hand written assignment to me in the class by 7th Nov 2024.

After deadline no submission will be accepted. **Please note do not submit assignment on the classroom.**

Q1. Write a recursive function to find top element in the given array. A top element is an element that is greater than its neighbours. There might be multiple top elements in an array, and the solution should report any peak element.

Input: [8, 9, 10, 2, 5, 6]

Output: The peak element is 10 (or 6)

Q2. Write a program in C using recursion for the following type of input and output.

Input: 8562724

Output: 4272658

Q3. Write a structure to store the roll no., name, address, city and marks in 3 subjects of students. Store the information of the 4 students and perform the following operation using a function:

I. Write a function to calculate the grade of each student based on average marks in the subjects.

Assign grades (A, B, C, D, F: A: avg>90, B:avg>80, C:avg>70, D:avg>59, F:avg<60). Print names of all students who got fail in the exam.

II. Write a search function that prints the details of students based on the name or city entered by the user.

III. Few failed students appear for the bonus exam and their subject marks increased. Write a function to edit the subject marks and call the function created in step 1 to re-calculate the grades.

Q4. Write a program to replace tabs in the input string with correct number of blanks spaces till the next tabstop. Assume one tab stop to be 8 blanks.

Q5. Write a C program to display and find the sum of the series 1+11+111+....111 upto n. For eg. if n=4, the series is : 1+11+111+1111. Take the value of 'n' as input from the user.

Q6. Write a C program that reads a positive integer n and then prints the following pattern

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    * * * * *
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        * * * * *
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            * * * * *
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                * * * * *
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                    * * * * *
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                        * * *
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                            **
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                                *
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where n is the number of lines.

Q7. Write a C program to input n numbers in an array, calculate the sum of all even numbers and all odd numbers in the array and print the larger sum.

Example: If the array contains the following elements: 2, 3, 3, 5, 4, 8, 7, 11, 2

The sum of all even elements is $2+4+8+2=16$ S

um of all odd elements is $3+3+5+7+11=29$

Therefore, the output should be 29.

Q8. Write a C program to check if a number has three consecutive 5s. If yes, print YES, else print NO.

Example: Number: 1353554 Result: NO

Number: 345559 Result: YES

Q9. Write a C program to accept the basic salary of an employee from the user. Calculate the gross salary on the following basis:

| Basic | HRA | DA |
|-----------------|-----|-----|
| 1 - 4000 | 10% | 50% |
| 4001 - 8000 | 20% | 60% |
| 8001 - 12000 | 25% | 70% |
| 12000 and above | 30% | 80% |