

CSE207 – Data Structure Section: 5

Recursion

1. Write a program to find GCD of two numbers. You must have to use recursive function to solve this problem.

Sample Input

a. 18, 24
b. 13, 23

Sample Output

6
1

2. (a). Suppose, you are given a number n. You have to print n, n-1, n-2 ...1 on the console. Write a recursive function to solve the problem.

Sample Input

6

Sample Output

6 5 4 3 2 1

- (b). Rewrite the previous program to print 1, 2 ...n-2, n-1, n on the console.

Sample Input

7

Sample Output

1 2 3 4 5 6 7

3. Write a recursive function to calculate factorial of a given number.

Sample Input

6

Sample Output

720

4. Write a program to calculate summation up to n-element of a Fibonacci sequence. You have to calculate the n-th element of the series using recursion.

Sample Input

8

Sample Output

21

5. Write a program using recursion to convert a given decimal number to binary number.

Sample Input

14

Sample Output

1110

6. Write a program using recursion to find the maximum element of an array of integers.

Sample Input

10 31 8 25

Sample Output

31

7. Write a program to reverse a string using recursion.

Sample Input

hello

Sample Output

olleh

8. Write a program to find the number of characters in a string using recursion.

Sample Input

hello

Sample Output

5

9. Write a program to check whether an integer is palindrome or not using recursion. [Hint: First find the reverse number using recursion. Then check whether the two are equal]

Sample Input

123321

Sample Output

palindrome

10. Write a program to delete n-th node of a given linked list using recursion.

For example, a linked list

6	2	57	53	18
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After deleting 3rd node, the list will be,

6	2	53	18
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11. Write a program to reverse a linked list using recursion.

For example, a linked list:

61	26	59	31	18
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After sorting the list,

18	31	59	26	61
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12. Generate all possible combinations of the elements of an array of integers using recursion.

Sample Input

11 3 21

Sample Output

11

3

21

11 3

3 21

11 21

11 3 21