**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 Sample Output

1. 18, 24 6
2. 13, 23 1

1. (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 Sample Output

6 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 Sample Output

7 1 2 3 4 5 6 7

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

Sample Input Sample Output

6 720

1. 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 Sample Output

8 21

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

Sample Input Sample Output

14 1110

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

Sample Input Sample Output

10 31 8 25 31

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

Sample Input Sample Output

hello olleh

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

Sample Input Sample Output

hello 5

1. 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 Sample Output

123321 palindrome

1. 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 |

After deleting 3rd node, the list will be,

|  |  |  |  |
| --- | --- | --- | --- |
| 6 | 2 | 53 | 18 |

1. Write a program to reverse a linked list using recursion.

For example, a linked list:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 61 | 26 | 59 | 31 | 18 |

After sorting the list,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 18 | 31 | 59 | 26 | 61 |

1. Generate all possible combinations of the elements of an array of integers using recursion.

Sample Input Sample Output

11 3 21 11

3

21

11 3

3 21

11 21

11 3 21