**East West University**

**Department of Computer Science and Engineering**

**CSE207 – Data Structures: LAB 04**

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## **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

* 1. 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

a. 7 1 2 3 4 5 6 7

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.

Hint: Fibonacci sequence is 0 1 1 2 3 5 8 13 21 ……. Every n-th element is the sum of previous two(n-1 and n-2)-th element. Suppose, you want to calculate the sum of first 9 terms of the Fibonacci sequence. First you have to calculate each of the term using a recursive function. Then add the newly calculated term one by one.

Sample Input Sample Output

a. 8 20

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 sort a linked list using recursion.

For example, a linked list:

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

After sorting the list,

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

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