SET213 – Data Structures & Algorithms

Experiment # 11

Experiment Title

Recursion

Assessment of CLO(s): IV

Performed on 20-12-2024

Student Name			
Roll No.		Group	
Semester		Session	

Total (Max)	Criteria 1 (2.5)	Criteria 2 (2.5)	Criteria 3 (2.5)	Criteria 4 (2.5)	Total (10)
Marks Obtained					
Remarks (if any)					

Experiment evaluated by

Instructor's Name	Engr. Muhammad Asad Husain		
Date		Signature	

Department of Engineering Technology
(UIT University)

Course Code: SET213 Course Title: Data Structures & Algorithms Course Credits: 3+1 Session: Fall 2024

Rubric for assessment criteria to perform experiment number 11.

Level / Criteria	UNSATISFACTORY 1	COMPETENT 2	PROFICIENT 3	DISTINGUISHED 4
Capability of writing algorithm/ Procedure	None of the steps are implemented of an algorithm.	Few steps are implemented correctly of an algorithm.	Most of the steps are implemented correctly of an algorithm.	All the steps are implemented correctly of an algorithm.
Capability of writing Program	Programs not completed.	Completeness of code, consistent variable naming and unformatted.	Completeness of code, inconsistent variable naming and well formatted.	Completeness of code, consistent variable naming and well formatted.
Completion of target in Lab	25% target has been completed	50% target has been completed	75% target has been completed	100% target has been completed
Output	None of the outputs are correct.	Few outputs have been found correctly.	Some of the outputs are correct and well formatted.	Most of the outputs are correct and well formatted.

Practical Objective(s):

i. Getting familiar with Recursion

Do It Yourself:

1. Write an algorithm for calculating factorial of number and implement the code in C++.

2. Write an algorithm for tower of Hanoi code in C++.

3. The algorithm for calculating Fibonacci Series is given below, implement these in C++.
Iterative Algorithm:

```
Procedure Fibonacci(n)
   declare f0, f1, fib, loop

   set f0 to 0
   set f1 to 1

   <b>display f0, f1</b>

   for loop ← 1 to n

      fib ← f0 + f1
      f0 ← f1
      f1 ← fib

      <b>display fib</b>
   end for
```

Recursive Algorithm:

```
 Procedure Fibonacci(n)
    declare f0, f1, fib, loop

    set f0 to 0
    set f1 to 1

    display f0, f1

    for loop ← 1 to n

       fib ← f0 + f1
       f0 ← f1
       f1 ← fib

       display fib
    end for
```