

Data Structure and Algorithm

Assignment-03 (Fall 2023)

**Submission to be done on UCP PORTAL before
Due Date: Saturday, January 13, 2024, 5:00 PM**

Task 1

Pattern Recognition using Recursion:

Write a recursive function in C++ that takes an integer n as input and prints a pattern of numbers as shown below for $n = 5$:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

Provide the code along with an explanation of how the function generates this pattern recursively.

Recursion and File System Traversal:

Create a C++ function that recursively traverses a directory structure and prints all file names with their paths. The function should take a directory path as input and display all files present in that directory and its subdirectories.

Recursion and Tree Traversal:

Implement a recursive function to perform an in-order traversal of a binary tree. The function should print the node values in ascending order. Also, write a brief explanation of how the recursive function traverses the tree in an in-order manner.

