Course Title: Algorithm Design and Analysis Laboratory
Course Code : CSE-226
Instructor : Fairuz Bilquis Khan

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Rep. No.	Name of Experiment	Date of Performance	Date of Submission	Remark
1	Implement Some Basic Data Structures of Python and C++ Programming Language (STL)	22/11/23	29/11/23	
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3	Find Minimum Spanning Tree Using Kruskal's Algorithm in C++ Programming Language	03/01/24	24/01/24	
4	Find Longest Common Subsequence Using Dynamic Programming	24/01/24	31/01/24	

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Lab Report

Report no	04
Report Title	Find Longest Common Subsequence (LCS) of Two Strings Using Dynamic Programing
Course Code	CSE 226
Course Title	Algorithm Design and Analysis Laboratory
Date of Performance	24-01-24
Date of Submission	31-01-24
Submitted to	
Fairuz Bilquis Khan Lecturer Department of CSE	
Submitted by	
Name	Mohammad Hafizur Rahman Sakib
ID	0222210005101118
Section	C
Semester	4th
Session	Fall 2023

```cpp
#include <bits/stdc++.h>
using namespace std;

int main()
{
    string x, y;
    cin >> x >> y;
    int m = x.size() + 1, n = y.size() + 1;
    vector<vector<string>> b(m, vector<string>(n, " "));
    vector<vector<int>> c(m, vector<int>(n, 0));

    for (int i = 1; i < m; i++)
    {
        c[i][0] = 0;
    }
    for (int j = 0; j < n; j++)
    {
        c[0][j] = 0;
    }
    for (int i = 1; i < m; i++)
    {
        for (int j = 1; j < n; j++)
        {
            if (x[i - 1] == y[j - 1])
            {
                c[i][j] = c[i - 1][j - 1] + 1;
                b[i][j] = "\\";
                // Taking the value From left Diagonal cell
            }
            else if (c[i - 1][j] >= c[i][j - 1])
            {
                c[i][j] = c[i - 1][j];
                b[i][j] = "|";
                // Taking the value From Upper cell
            }
            else
            {
                c[i][j] = c[i][j - 1];
                b[i][j] = "->";
                // Taking the value From Left Side cell
            }
        }
    }

    for (int i = 0; i < c.size(); i++)
    {
        for (int u : c[i])
        {
            cout << u << ' ';
        }
        cout << endl;
    }

    cout << endl;

    for (int i = 0; i < b.size(); i++)
    {
        for (string u : b[i])
        {
            cout << u << ' ';
        }
        cout << endl;
    }

    cout << "Length of LCS is : " << c[m - 1][n - 1] << endl;

    return 0;
}
```

Output :

```
▷ SAKIB ▱ Performance Test
• ↳  cd "c:\PU Projects\PUC Courses\4th Semester\A
cs }
MZJAWXU
XMJYAUZ
0 0 0 0 0 0 0 0
0 0 1 1 1 1 1 1
0 0 1 1 1 1 1 2
0 0 1 2 2 2 2 2
0 0 1 2 2 3 3 3
0 0 1 2 2 3 3 3
0 1 1 2 2 3 3 3
0 1 1 2 2 3 4 4


  | \ -> -> -> -> ->
  | | | | | | \
  | | \ -> -> -> |
  | | | | \ -> ->
  | | | | | | |
  \ | | | | | |
  | | | | | \ ->
Length of LCS is : 4
▷ SAKIB ▱ Performance Test
```