

Course Title: Algorithm Design and Analysis Laboratory

Course Code : CSE-226

ID : 0222210005101118 (C)

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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	
2	Factorial of a number, Fibonacci Series and Digit Sum of a number Using Recursion	27/12/23	03/01/24	
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	

Premier University



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

```

1 #include <bits/stdc++.h>
2 using namespace std;
3
4 int main()
5 {
6     string x, y;
7     cin >> x >> y;
8     int m = x.size() + 1, n = y.size() + 1;
9     vector<vector<string>> b(m, vector<string>(n, " "));
10    vector<vector<int>> c(m, vector<int>(n, 0));
11
12    for (int i = 1; i < m; i++)
13    {
14        c[i][0] = 0;
15    }
16    for (int j = 0; j < n; j++)
17    {
18        c[0][j] = 0;
19    }
20    for (int i = 1; i < m; i++)
21    {
22        for (int j = 1; j < n; j++)
23        {
24            if (x[i - 1] == y[j - 1])
25            {
26                c[i][j] = c[i - 1][j - 1] + 1;
27                b[i][j] = "\\";
28                // Taking the value From left Diagonal cell
29            }
30            else if (c[i - 1][j] >= c[i][j - 1])
31            {
32                c[i][j] = c[i - 1][j];
33                b[i][j] = "|";
34                // Taking the value From Upper cell
35            }
36            else
37            {
38                c[i][j] = c[i][j - 1];
39                b[i][j] = "->";
40                // Taking the value From Left Side cell
41            }
42        }
43    }
44
45    for (int i = 0; i < c.size(); i++)
46    {
47        for (int u : c[i])
48        {
49            cout << u << ' ';
50        }
51        cout << endl;
52    }
53
54    cout << endl;
55
56    for (int i = 0; i < b.size(); i++)
57    {
58        for (string u : b[i])
59        {
60            cout << u << ' ';
61        }
62        cout << endl;
63    }
64
65    cout << "Length of LCS is : " << c[m - 1][n - 1] << endl;
66
67    return 0;
68 }
69

```

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
```