THE UNIVERSITY OF TEXAS AT ARLINGTON

DESIGN AND ANALYSIS OF ALGORITHM

(CSE 5311)

PROJECT – 2

Project report by:

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- **Sources Referred**

  i. Geeks for Geeks (link)
  ii. Geeks for Geeks LCS print (link)
  iii. Programiz (link)
  iv. Python Documentation (link)
  v. Techie delight (link)
  vi. Lecture Slides

- **Time Complexity of the Algorithm**

Algorithm	Best	Average	Worst
LCS_DP_BC(x, y)	Ω(n*m)	θ(n*m)	O(n*m)
Printlcs(X, Y, m, n)	Ω(n+m)	θ(n+m)	O(n+m)

- **Final Output**

  For line 1:

```
X = "Diagonal" Y = "Dragon"
-----------------------------------
    |       1   2   3   4   5   6
    |   Y   D   r   a   g   o   n
-----------------------------------
  X |   0   0   0   0   0   0   0
1 D |   0  \1  <1  <1  <1  <1  <1
2 i |   0  ^1  ^1  ^1  ^1  ^1  ^1
3 a |   0  ^1  ^1  \2  <2  <2  <2
4 g |   0  ^1  ^1  ^2  \3  <3  <3
5 o |   0  ^1  ^1  ^2  ^3  \4  <4
6 n |   0  ^1  ^1  ^2  ^3  ^4  \5
7 a |   0  ^1  ^1  \2  ^3  ^4  ^5
8 l |   0  ^1  ^1  ^2  ^3  ^4  ^5
-----------------------------------
Length of the Longest Common Subsequence is: 5
The Longest Common Subsequence of  "Diagonal" and "Dragon" is "Dagon"
```

For line 2:

```
X = "NOAH" Y = "BOAT"
---------------------------
    |       1   2   3   4
    |   Y   B   O   A   T
---------------------------
  X |   0   0   0   0   0
1 N |   0  ^0  ^0  ^0  ^0
2 O |   0  ^0  \1  <1  <1
3 A |   0  ^0  ^1  \2  <2
4 H |   0  ^0  ^1  ^2  ^2
---------------------------
Length of the Longest Common Subsequence is: 2
The Longest Common Subsequence of  "NOAH" and "BOAT" is "OA"
```

For line 3:

```
X = "FARAH" Y = "FaaaRAh"
---------------------------------------
    |       1   2   3   4   5   6   7
    |   Y   F   a   a   a   R   A   h
---------------------------------------
  X |   0   0   0   0   0   0   0   0
1 F |   0  \1  <1  <1  <1  <1  <1  <1
2 A |   0  ^1  ^1  ^1  ^1  ^1  \2  <2
3 R |   0  ^1  ^1  ^1  ^1  \2  ^2  ^2
4 A |   0  ^1  ^1  ^1  ^1  ^2  \3  <3
5 H |   0  ^1  ^1  ^1  ^1  ^2  ^3  ^3
---------------------------------------
Length of the Longest Common Subsequence is: 3
The Longest Common Subsequence of  "FARAH" and "FaaaRAh" is "FRA"
```

For line 4:

```
X = "PARAMETER" Y = "MeTeR"
------------------------------
    |       1   2   3   4   5
    |   Y   M   e   T   e   R
------------------------------
  X |   0   0   0   0   0   0
1 P |   0  ^0  ^0  ^0  ^0  ^0
2 A |   0  ^0  ^0  ^0  ^0  ^0
3 R |   0  ^0  ^0  ^0  ^0  \1
4 A |   0  ^0  ^0  ^0  ^0  ^1
5 M |   0  \1  <1  <1  <1  ^1
6 E |   0  ^1  ^1  ^1  ^1  ^1
7 T |   0  ^1  ^1  \2  <2  <2
8 E |   0  ^1  ^1  ^2  ^2  ^2
9 R |   0  ^1  ^1  ^2  ^2  \3
------------------------------
Length of the Longest Common Subsequence is: 3
The Longest Common Subsequence of  "PARAMETER" and "MeTeR" is "MTR"
```

HONOR CODE

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and
honest effort in the pursuit of academic excellence.
I promise that I will submit only work that I personally create or that I contribute to group collaborations, and I will
appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the
spirit of the Honor Code
I will not participate in any form of cheating/sharing the questions/solutions.

JAY SHAH 1002070971 DATE: - 11/26/2022

DEEP PATEL 1002052935 DATE: - 11/26/2022

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JAY SHAH
UTA ID:- 1002070971
11/26/2022

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UTA ID :- 1002052935

26th November '2022