# Longest Common Sequence (LCS):

The **longest common subsequence** (**LCS**) **problem** is the problem of finding the longest common sequences in a set of sequences.

**Definition:**

1. Initially, the code will take the strings as input. Then it calculates the length of each string and prints it for the user to verify.

Text

Description automatically generated with medium confidence

1. Now, we call the function lcs(X, Y, m, n) by passing the two strings and their lengths to calculate the tables B and C. This function returns table B and table C. Next, we call the function compute\_lcs(c, m, n) by passing table c and the lengths of the strings. This function computes the final output. Finally, we call the function print\_lcs(b, c, m, n) to print the final output along with tables B and C.

Text

Description automatically generated with medium confidence

**LCS Algorithm:**

1. Firstly, the function takes X and Y strings as input and their lengths m and n as input.
2. Now, we populate tables B and C based on the below recursive formula.

**Text, letter

Description automatically generated**

1. The function finally returns the final tables B and C.

**Graphical user interface, text, application

Description automatically generated**

1. The function compute\_lcs(C, m, n) uses the computed C table to get the longest common sequence from the table using the optimized algorithm as shown below. This function returns the result, the longest common sequence of the two input strings X and Y.

**A picture containing background pattern

Description automatically generated**

1. Finally, we print all the results and tables using the function print\_lcs(b, c, m, n).

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**Code for LCS:**

Text

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Description automatically generated

Graphical user interface

Description automatically generated

**Execution/ Output:**

1. **For given inputs “spanking” and “amputation”**

**Graphical user interface

Description automatically generated with low confidence**

1. **For other input AGGTAB and GXTXAYB**

**Calendar

Description automatically generated**

1. **For other input ABCDGH and AEDFHR**

**Calendar

Description automatically generated**