Assignment - Day 8: LCS Variations

Assignment Problems:

1. Longest Common Substring (GFG)

Link: https://www.geeksforgeeks.org/problems/longest-common-substring1452/1
Objective: Find the length of the longest common substring between two strings.
Hint: Use a 2D DP table where dp[i][j] holds the length of the current common substring ending at (i, j).

2. Shortest Common Supersequence (LeetCode 1092)

Link: https://leetcode.com/problems/shortest-common-supersequence/
Objective: Return the shortest string that has both strings as subsequences.
Hint: Length = len(s1) + len(s2) - LCS(s1, s2). Construct using backtracking on the LCS table.

3. Distinct Subsequences (LeetCode 115)

Link: https://leetcode.com/problems/distinct-subsequences/
Objective: Count the number of distinct subsequences of s equal to t.
Hint: If chars match → dp[i][j] = dp[i-1][j-1] + dp[i-1][j], else dp[i][j] = dp[i-1][j].

4. Minimum Insertions to Make Palindrome (LeetCode 1312)

Link: https://leetcode.com/problems/minimum-insertion-steps-to-make-a-string-palindrome/
Objective: Find minimum number of insertions to make string a palindrome.
Hint: Answer = len(s) - LPS(s). LPS = LCS(s, reverse(s)).

5. Delete Operation for Two Strings (LeetCode 583)

Link: https://leetcode.com/problems/delete-operation-for-two-strings/
Objective: Return minimum deletions needed to make two strings equal.
Hint: Let LCS = LCS(s1, s2). Answer = (len(s1) - LCS) + (len(s2) - LCS).

6. Longest Repeating Subsequence (GFG)

Link: https://practice.geeksforgeeks.org/problems/longest-repeating-subsequence2004/1
Objective: Find the longest subsequence that appears at least twice.

Hint: Same as LCS(s, s) but ensure i != j.

7. Wildcard Matching (LeetCode 44)

Link: https://leetcode.com/problems/wildcard-matching/description/
Objective: Match a pattern containing ? and * with a string.
Hint: dp[i][j] determines match status. ? → one char, * → zero or more chars.

What to Submit:

- Memoization solution (where applicable)
- Tabulation DP solution
- For SCS, also provide the constructed sequence
- For Wildcard Matching, tabulation is mandatory

Deadline:

16 November, 11.59 PM

Best regards,
Training Team