

Dynamic Programming

Program – 2

Aim:

To find the length of the longest common subsequence (LCS) between two given strings using Dynamic Programming.

Input:

- First line: A string s1
- Second line: A string s2

Code:

```
#include <stdio.h>
```

```
#include <string.h>
```

```
int longest_common_subsequence(char* s1, char* s2) {
```

```
    int m = strlen(s1);
```

```
    int n = strlen(s2);
```

```
    int dp[m+1][n+1];
```

```
    for (int i = 0; i <= m; i++) {
```

```
        for (int j = 0; j <= n; j++) {
```

```
            if (i == 0 || j == 0) {
```

```
                dp[i][j] = 0;
```

```
            } else if (s1[i-1] == s2[j-1]) {
```

```
                dp[i][j] = dp[i-1][j-1] + 1;
```

```
            } else {
```

```

        dp[i][j] = (dp[i-1][j] > dp[i][j-1]) ? dp[i-1][j] : dp[i][j-1];
    }

}

return dp[m][n];
}

int main() {
    char s1[100], s2[100];

    scanf("%s", s1);
    scanf("%s", s2);

    printf("%d\n", longest_common_subsequence(s1, s2));

    return 0;
}

```

Output:

	Input	Expected	Got	
✓	aab azb	2	2	✓
✓	ABCD ABCD	4	4	✓

Passed all tests! ✓