**PSG COLLEGE OF TECHNOLOGY, COIMBATORE -641004**

**DEPARTMENT OF COMPUTER APPLICATIONS**

**I SEMESTER McA**

**23MX16 C PROGRAMMING LABORATORY**

**PROBLEM SHEET 6 - wEEK 7 AND 8 – ARRAYS AND STRINGS**

1. Write a C program to find the longest common prefix string amongst an array of strings. If there is no common prefix, return an empty string "".

Test case 1:

Input: strs = ["flower","flow","flight"]

Output: "fl"

Test case 2:

Input: strs = ["dog","racecar","car"]

Output: ""

Explanation: There is no common prefix among the input strings.

Constraints:

1 <= strs.length <= 200

0 <= strs[i].length <= 200

strs[i] consists of only lowercase English letters.

1. Given a string s consisting of words and spaces, Write a C program to find the length of the last word in the string. A word is a maximal substring consisting of non-space characters only.

Test case 1:

Input: s = "Hello World"

Output: 5

Explanation: The last word is "World" with length 5.

Test case 2:

Input: s = " fly me to the moon "

Output: 4

Explanation: The last word is "moon" with length 4.

Test case 3:

Input: s = "luffy is still joyboy"

Output: 6

Explanation: The last word is "joyboy" with length 6.

Constraints:

1 <= s.length <= 104

s consists of only English letters and spaces ' '. There will be at least one word in s.

1. You are given a string ***'str'*** of length ***'N'***. Write a C program to reverse the original string word by word. There can be multiple spaces between two words and there can be leading or trailing spaces but in the output reversed string you need to put a single space between two words, and your reversed string should not contain leading or trailing spaces.

**Example :**

If the given input string is "Welcome to PSG College", then you should return "College PSG to Welcome" as the reversed string has only a single space between two words and there is no leading or trailing space.

##### Sample Input 1 :

Welcome to PSG College

##### Sample Output 1:

College PSG to Welcome

##### Explanation For Sample Input 1:

You need to reduce multiple spaces between two words to a single space in the reversed string and observe how the multiple spaces, leading and trailing spaces have been removed.

##### Sample Input 2 :

I am a star

##### Sample Output 2:

star a am I

##### Explanation For Sample Input 2:

Your reversed string should not contain leading or trailing spaces.

1. A message containing letters from A-Z is being encoded to numbers using the following mapping:  
   'A' -> 1  
   'B' -> 2  
   ...  
   'Z' -> 26  
   Given a non-empty string containing only digits, determine the total number of ways to decode it.

**Test Case 1:**

Input: "12"  
Output: 2  
Explanation: It could be decoded as "AB" (1 2) or "L" (12).

**Test Case 2:**

Input: "226"  
Output: 3  
Explanation: It could be decoded as "BZ" (2 26), "VF" (22 6), or "BBF" (2 2 6).

1. Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid. An input string is valid if:

-Open brackets must be closed by the same type of brackets.

-Open brackets must be closed in the correct order.

-Every close bracket has a corresponding open bracket of the same type.

Test Case 1:

Input: s = "()"

Output: true

Test Case 2:

Input: s = "()[]{}"

Output: true

Test Case 3:

Input: s = "(]"

Output: false

Constraints:

1 <= s.length <= 104

s consists of parentheses only '()[]{}'.

1. Given a string s, find the length of the longest substring without repeating characters.

Test Case 1:

Input: s = "abcabcbb"

Output: 3

Explanation: The answer is "abc", with the length of 3.

Test Case 2:

Input: s = "bbbbb"

Output: 1

Explanation: The answer is "b", with the length of 1.

Test Case 3:

Input: s = "pwwkew"

Output: 3

Explanation: The answer is "wke", with the length of 3.

Note that the answer must be a substring, "pwke" is a subsequence and not a substring.

Constraints:

0 <= s.length <= 5 \* 104

s consists of English letters, digits, symbols and spaces.