03 - Programming Exercises
string

Program each of the following tasks in your C++ compiler. Keep compiling and executing even after writing a single line of code.

Task 1

Write a program that checks if an entered string is a palindrome. A palindrome is a word, phrase, or sequence of characters that reads the same forward as backward (ignoring spaces, punctuation, and capitalization). The program should prompt the user to enter a string and then determine if it is a palindrome.

Sample Run 1	Sample Run 2	Sample Run 3
Enter a string: radar The entered string is a palindrome.	Enter a string: A man, a plan, a canal, Panama! The entered string is a palindrome.	Enter a string: Was it a car or a cat I saw? The entered string is a palindrome.

Task 02

Write a program that counts the number of words in a string entered by the user. Implement a function **countWords** that takes a string as its argument and returns the number of words in it. The function should not perform any input or output operations.

Ensure that the function signature is as follows:

```
int countWords(const string input);
```

Sample Run 1	Sample Run 2
Enter a string: C++ Programming is Fun! Number of words in the entered string: 4	Enter a string: This is a sample sentence with more than 7 words. Number of words in the entered string: 9

Task 03

Write a program that takes a sentence as input and counts the number of vowels (both uppercase and lowercase) in it. Display the count of each vowel separately (i.e., the number of 'a's, 'e's, 'i's, 'o's, and 'u's). Implement a function **countVowels** that takes a string as its argument and displays each vowel with its counts. The function should not perform any input operations.

Ensure that the function signature is as follows:

```
void countVowels(const string input);
```

Sample Run 1	Sample Run 2	Sample Run 3
Enter a sentence: The quick brown fox jumps over the lazy dog. Vowel counts: a: 1 e: 3 i: 1 o: 4 u: 2	Enter a sentence: Hello, World! Vowel counts: a: 0 e: 1 i: 0 o: 2 u: 0	Enter a sentence: Programming is fun. Vowel counts: a: 2 e: 1 i: 3 o: 1 u: 1

Task 04

Write a program with a function that accepts an array of strings and returns a new string. The new string should contain all the elements (strings) from the array separated by a blank space. The function should not perform any input or output operations. The program should then demonstrate the functionality of this function by taking user input for an array of strings and displaying the resulting concatenated string.

Ensure that the function signature is as follows:

```
string concatenateStrings(const string arr[], const int size);
```

The function should take an array of strings (**arr**) and its size (**size**) as parameters, and it should return a new string.

For Example, the array contains: "Learn C++", "Code daily", "Practice coding", "Succeed"

After calling the function, it returns: "Learn C++ Code daily Practice coding Succeed"

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