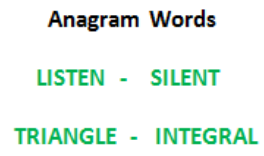
Check whether two strings are anagram of each other | C++ foundation

Write a function to check whether two given strings are anagram of each other or not. An anagram of a string is another string that contains the same characters, only the order of characters can be different. For example, "abcd" and "dabc" are an anagram of each other.



Method 1 (Use Sorting)

1. Sort both strings
2. Compare the sorted strings

Below is the implementation of the above idea:

```
// C++ program to check whether two strings are anagrams
// of each other
#include <bits/stdc++.h>
using namespace std;

/* function to check whether two strings are anagram of
each other */
bool areAnagram(string str1, string str2)
{
    // Get lengths of both strings
    int n1 = str1.length();
    int n2 = str2.length();

    // If length of both strings is not same, then they
    // cannot be anagram
```

```
    if (n1 != n2)
        return false;

    // Sort both the strings
    sort(str1.begin(), str1.end());
    sort(str2.begin(), str2.end());

    // Compare sorted strings
    for (int i = 0; i < n1; i++)
        if (str1[i] != str2[i])
            return false;

    return true;
}

// Driver code
int main()
{
    string str1 = "test";
    string str2 = "ttew";

    // Function Call
    if (areAnagram(str1, str2))
        cout << "The two strings are anagram of each other";
    else
        cout << "The two strings are not anagram of each "
                "other";

    return 0;
}
```

Output

```
The two strings are not anagram of each other
```

Time Complexity: O(nLogn)

Method 2 (Count characters)

This method assumes that the set of possible characters in both strings is small. In the following implementation, it is assumed that the characters are stored using 8 bit and there can be 256 possible characters.

1. Create count arrays of size 256 for both strings. Initialize all values in count arrays as 0.
2. Iterate through every character of both strings and increment the count of character in the corresponding count arrays.
3. Compare count arrays. If both count arrays are same, then return true.

Below is the implementation of the above idea:

```
// C++ program to check if two strings
// are anagrams of each other
#include <bits/stdc++.h>
using namespace std;
#define NO_OF_CHARS 256

/* function to check whether two strings are anagram of
each other */
bool areAnagram(char* str1, char* str2)
{
    // Create 2 count arrays and initialize all values as 0
    int count1[NO_OF_CHARS] = { 0 };
    int count2[NO_OF_CHARS] = { 0 };
    int i;

    // For each character in input strings, increment count
    // in the corresponding count array
    for (i = 0; str1[i] && str2[i]; i++) {
        count1[str1[i]]++;
        count2[str2[i]]++;
    }

    // If both strings are of different length. Removing
    // this condition will make the program fail for strings
    // like "aaca" and "aca"
    if (str1[i] || str2[i])
        return false;
```

```
    // Compare count arrays
    for (i = 0; i < NO_OF_CHARS; i++)
        if (count1[i] != count2[i])
            return false;

    return true;
}

/* Driver code*/
int main()
{
    char str1[] = "geeksforgeeks";
    char str2[] = "forgeeksgeeks";

    // Function Call
    if (areAnagram(str1, str2))
        cout << "The two strings are anagram of each other";
    else
        cout << "The two strings are not anagram of each "
                "other";

    return 0;
}
```

Output

```
The two strings are anagram of each other
```

Time Complexity : O(n)

Space Complexity : O(NO_OF_CHAR) = O(256) = O(1) (constant space use)