Check if two Strings are anagrams of each other

Problem Statement: Given two strings, check if two strings are anagrams of each other or not.

Examples:

```
Example 1:

Input: CAT, ACT

Output: true

Explanation: Since the count of every letter of both strings are equal.

Example 2:

Input: RULES, LESRT

Output: false

Explanation: Since the count of U and T  is not equal in both strings.
```

Solution

Solution 1:

Approach: Sort both the string and compare each and every letter of both strings. If all letters matched then, print true. Otherwise, print false.

For Eg.

We have

Str1 = “INTEGER”

Str2=”TEGERNI”

After sorting Str1 and Str2, we find that both of the strings are

Str1 =” EEGINRT”

Str2=” EEGINRT”

Since both of the strings are the same, this means both Str1 and Str2 are anagrams of each other.

Code:

- C++ Code
- Java Code

```cpp
#include <iostream>

#include <algorithm>

using namespace std;

bool CheckAnagrams(string str1, string str2)

{
  // Case 1: when both of the strings have different lengths
  if (str1.length() != str2.length())
    return false;

  sort(str1.begin(), str1.end());
  sort(str2.begin(), str2.end());

  // Case 2: check if every character of str1 and str2 matches with each other
  for (int i = 0; i < str1.length(); i++)
  {
    if (str1[i] != str2[i])
      return false;
  }
  return true;
}
int main()
{
  string Str1 = "INTEGER";
  string Str2 = "TEGERNI";
  if(CheckAnagrams(Str1, Str2))
  cout << "True" << endl;
  else
  cout<<"False"<<endl;
  return 0;
}
```

Output: True

Time Complexity: O(nlogn) since sorting function requires nlogn iterations.

Space Complexity: O(1)

Solution 2:

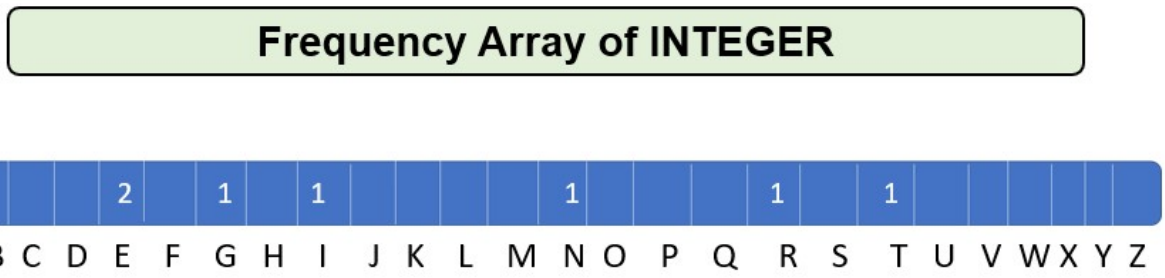
Approach: Just count the frequency of every element in Str1 and iterate through Str2 and decrease the count of every element in the frequency array. Now iterate again, if the frequency at any point is not 0 this means, strings are not anagrams of each other.

For Eg,

Str1 = "INTEGER"

Str2 = "NTEGERI"

Frequency array of every element :



We check for every element of Str2 and find that all elements are found, so return true.

Code:

- C++ Code
- Java Code

```cpp
#include <iostream>

#include <algorithm>

using namespace std;

bool CheckAnagrams(string str1, string str2)

{
  // when both of the strings have different lengths
  if (str1.length() != str2.length())
    return false;

  int freq[26] = {0};
```

```
  for (int i = 0; i < str1.length(); i++)
  {
    freq[str1[i] - 'A']++;
  }
  for (int i = 0; i < str2.length(); i++)
  {
    freq[str2[i] - 'A']--;
  }
  for (int i = 0; i < 26; i++)
  {
    if (freq[i] != 0)
      return false;
  }
  return true;
}
int main()
{
  string Str1 = "INTEGER";
  string Str2 = "TEGERNI";
  if(CheckAnagrams(Str1, Str2))
  cout << "True" << endl;
  else
  cout<<"False"<<endl;
  return 0;
}
```

Output: True

Time Complexity: O(n) where n is the length of string

Space Complexity: O(1)

Anagrams of String

Anagrams of the string are all the possible permutations of the string.