SOLUTION BOOK

❤️ From SIDDHARTH SINGH

STRING

1) **Program to Find the Frequency of Characters in a String**

CODE:

```
#include <iostream>
using namespace std;

int main()
{
    string str = "C++ Programming is awesome";
    char checkCharacter = 'a';
    cout<<"Enter a character:";
    cin>>checkCharacter;
    int count = 0;

    for (int i = 0; i < str.size(); i++)
    {
        if (str[i] ==  checkCharacter)
        {
            ++ count;
        }
    }

    cout << "Number of " << checkCharacter << " = " << count;

    return 0;
}
```

Output

Enter a character: a

Number of a = 2

CONCEPT:

size() function is used to find the length of a string object.

2) **Program to Find the Number of Vowels, Consonants, Digits and White Spaces in a String**

CODE:

```
#include <iostream>
```

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```
using namespace std;

int main()
{
   string line;
   int vowels, consonants, digits, spaces;

   vowels =  consonants = digits = spaces = 0;

   cout << "Enter a line of string: ";
   getline(cin, line);

   for(int i = 0; i < line.length(); ++i)
   {
      if(line[i]=='a' || line[i]=='e' || line[i]=='i' ||
         line[i]=='o' || line[i]=='u' || line[i]=='A' ||
         line[i]=='E' || line[i]=='I' || line[i]=='O' ||
         line[i]=='U')
      {
         ++vowels;
      }
      else if((line[i]>='a'&& line[i]<='z') || (line[i]>='A'&& line[i]<='Z'))
      {
         ++consonants;
      }
      else if(line[i]>='0' && line[i]<='9')
      {
         ++digits;
      }
      else if (line[i]==' ')
      {
         ++spaces;
      }
   }

   cout << "Vowels: " << vowels << endl;
   cout << "Consonants: " << consonants << endl;
   cout << "Digits: " << digits << endl;
   cout << "White spaces: " << spaces << endl;
```

```
    return 0;
}
```

Output

```
Enter a line of string: I have 2 C++ programming books.
Vowels: 8
Consonants: 14
Digits: 1
White spaces: 5
```

3) **Program to Remove all Characters in a String Except Alphabets**

CODE:

```
#include <iostream>
using namespace std;

int main() {
    string line;
    string temp = "";

    cout << "Enter a string: ";
    getline(cin, line);

    for (int i = 0; i < line.size(); ++i) {
        if ((line[i] >= 'a' && line[i] <= 'z') || (line[i] >= 'A' && line[i] <= 'Z')) {
            temp = temp + line[i];
        }
    }
    line = temp;
    cout << "Output String: " << line;
    return 0;
}
```

Output

```
Enter a string: p2'r"o@gram84iz./
Output String: programiz
```

4) **Program to Find the Length of a String**

CODE:

```
#include <iostream>
using namespace std;

int main() {
    string str = "C++ Programming";
```

```
    // you can also use str.length()
    cout << "String Length = " << str.size();

    return 0;
}
```

Output

```
String Length = 15
```

5) **Program to Concatenate Two Strings**

CODE:

```
#include <iostream>
using namespace std;

int main()
{
    string s1, s2, result;

    cout << "Enter string s1: ";
    getline (cin, s1);

    cout << "Enter string s2: ";
    getline (cin, s2);

    result = s1 + s2;

    cout << "Resultant String = "<< result;

    return 0;
}
```

Output

```
Enter string s1: C++ Programming
Enter string s2:  is awesome.
Resultant String = C++ Programming is awesome.
```

6) **Program to Copy Strings**

CODE:

```
#include <iostream>
using namespace std;

int main()
```

```
{
    string s1, s2;

    cout << "Enter string s1: ";
    getline (cin, s1);

    s2 = s1;

    cout << "s1 = "<< s1 << endl;
    cout << "s2 = "<< s2;

    return 0;
}
```

7) Program to change every letter in a given string with the letter following it in the alphabet

CODE:

```
#include <iostream>
#include <string>
using namespace std;

string change_letter(string str)
{

        int char_code;

        for (int x = 0; x < str.length(); x++)
        {
                char_code = int(str[x]);

                if (char_code == 122)
                {
                        str[x] = char(97);
                }
                else if (char_code == 90)
                {
                        str[x] = char(65);
                }
                else if (char_code >= 65 && char_code <= 90 || char_code >= 97 &&
char_code <= 122)
                {
```

```
                        str[x] = char(char_code + 1);
                }

        }

        return str;
}

int main()
{
        cout << "Original string:abcdefg";
        cout << "\nNew string: " << change_letter("abcdefg");
        cout << "\n\nOriginal string: Python";
        cout << "\nNew string: " << change_letter("Python");
        return 0;
}
```

Original string: abcdefg
New string: bcdefgh

Original string: Python
New string: Qzuipo

8) Program to count all the words in a given string

CODE:

```
#include <iostream>
#include <string>
using namespace std;

int Word_count(string text) {

        int ctr = 0;
        for (int x = 0; x < text.length(); x++)
        {
                if (text[x] == ' ')
                        ctr++;
        }
        return ctr + 1;
}

int main() {
```

```
	cout << "Original string: Python, number of words -> " << Word_count("Python") << endl;
	cout << "\nOriginal string: CPP Exercises, number of words -> " << Word_count("CPP Exercises") << endl;
	cout << "\nOriginal string: After eagling the Road Hole on Thursday, he missed an 8-footer for birdie Friday., \nnumber of words -> ";
		cout << Word_count("After eagling the Road Hole on Thursday, he missed an 8-footer for birdie Friday.") << endl;
	return 0;
}
```

Output

```
Original string: Python, number of words -> 1

Original string: CPP Exercises, number of words -> 2

Original string: After eagling the Road Hole on Thursday, he missed an 8-footer for birdie Friday.,
number of words -> 14
```

9) Program to capitalize the first letter of each word of a given string

CODE:

```
#include <iostream>
#include <string>

using namespace std;

string Capitalize_first_letter(string text) {

	for (int x = 0; x < text.length(); x++)
	{
		if (x == 0)
		{
			text[x] = toupper(text[x]);
		}
		else if (text[x - 1] == ' ')
		{
			text[x] = toupper(text[x]);
		}
	}
```

```
        return text;
}

int main()
{
        cout << Capitalize_first_letter("Write a C++ program");
        cout << "\n" << Capitalize_first_letter("cpp string exercises");
        return 0;
}
```

Output

Write A C++ Program
Cpp String Exercises

10) Program to find the largest word in a given string

CODE:

```
#include <iostream>
#include <string>
using namespace std;

string Longest_Word(string text) {

        string result_word, temp_str1;

        for (int x = 0; x < text.length(); x++)
        {
                if (text[x] != ' ' && (int(text[x]) >= 65 && int(text[x]) <= 90) || (int(text[x]) >=
97 && int(text[x]) <= 122) || (int(text[x] >= 48 && int(text[x])<= 57)))
                {
                        result_word.push_back(text[x]);
                }
                else
                {
                        break;
                }
        }

  for (int x = 0; x < text.length(); x++)
        {
```

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```
                if (text[x] != ' ' && (int(text[x]) >= 65 && int(text[x]) <= 90) || (int(text[x]) >=
97 && int(text[x]) <= 122) || (int(text[x] >= 48 && int(text[x]) <= 57)))
                {
                        temp_str1.push_back(text[x]);
        //Below condition is For last word since last word is not separated by space
                        if (x + 1 == text.length() && temp_str1.length() >
result_word.length())
                        {
                                result_word = temp_str1;
                        }
                }
                else
                {
                        if (temp_str1.length() > result_word.length())
                        {
                                result_word = temp_str1;
                        }

                        temp_str1.clear();
                }
        }

        return result_word;
}

int main() {
        cout << "Original String: C++ is a general-purpose programming language.
\nLongest word: " << Longest_Word("C++ is a general-purpose programming
language.") << endl;
}
```

Output

Original String: C++ is a general-purpose programming language.
Longest word: programming