

CSC 150 LAB 3-1 FUNCTIONS

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1. FREQUENCY OF A CHARACTER FUNCTION

Write a function function

```
int char_freq(string s, char ch)
```

that takes a string `s` and a character `ch` as parameters and returns the number of times `ch` occurs in `s`.

Test it by printing out the frequency of all the vowels `a`, `e`, `i`, `o`, `u` in the string entered by the user.

Use the following program to test your function

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

int char_freq(string s, char ch)
{

    return 0;
}

int main()
{

    // Test the char_freq function by calling it for all vowels 3 times
    for (int count = 1; count <= 3; count++)
    {
        string str; // string to read in

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

        cout << "You entered the string: " << str << endl;

        cout << "The frequencies of a, e, i, o, and u are: \n";
        cout << 'a' << " : " << char_freq(str, 'a') << endl;
        cout << 'e' << " : " << char_freq(str, 'e') << endl;
        cout << 'i' << " : " << char_freq(str, 'i') << endl;
        cout << 'o' << " : " << char_freq(str, 'o') << endl;
        cout << 'u' << " : " << char_freq(str, 'u') << endl;
    }
}
```

```
    }  
}
```

Here is a sample interaction

```
Enter a string: better days are ahead  
You entered the string: better days are ahead  
The frequencies of a, e, i, o, and u are:  
a : 4  
e : 4  
i : 0  
o : 0  
u : 0  
Enter a string: north central college  
You entered the string: north central college  
The frequencies of a, e, i, o, and u are:  
a : 1  
e : 3  
i : 0  
o : 2  
u : 0  
Enter a string: bigger is not always better  
You entered the string: bigger is not always better  
The frequencies of a, e, i, o, and u are:  
a : 2  
e : 3  
i : 2  
o : 1  
u : 0
```

2. THE FACTORIAL OF A NUMBER

The factorial of a number is the product of all positive integers less or equal to the number. For example, the factorial of 3 is $1 \times 2 \times 3 = 6$.

The factorial of 0 is defined to be 1.

Write a function

```
long factorial(long number)
```

that returns the factorial of a given non-negative integer.

Test your function by adding code that prints the factorial of the integers 0 through 10, and then asks the user to enter a non-negative integer of their choice, and prints its factorial.

Do not remove the previously written code for the frequency of characters.

3. FACTORIAL OF THE FREQUENCY OF A CHARACTER IN A STRING

Add code that asks the user to enter a string and a character, and prints the factorial of the frequency of that character in the string. A sample interaction of the entire program should look like this:

```
Enter a string: better days are ahead
You entered the string: better days are ahead
The frequencies of a, e, i, o, and u are:
a : 4
e : 4
i : 0
o : 0
u : 0
Enter a string: north central college
You entered the string: north central college
The frequencies of a, e, i, o, and u are:
a : 1
e : 3
i : 0
o : 2
u : 0
Enter a string: bigger is not always better
You entered the string: bigger is not always better
The frequencies of a, e, i, o, and u are:
a : 2
e : 3
i : 2
o : 1
u : 0
The factorials of 0 through 10 are:
1 1 2 6 24 120 720 5040 40320 362880 3628800
Enter a sentence: bigger is not always better
Enter a character: e
The factorial of the frequency of e in the sentence is 6
```