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Script started on 2023-09-27 12:16:32-05:00 [TERM="xterm" TTY="/dev/pts/0" COLUMNS=
mf98604@ares:~$ pwd
/home/students/mf98604
mf98604@ares:~$ cat resist.info

Name: Philip May'r
Class: CSC121-001

Activity: Resistance Is Everything
Level: 5.5

Description: Calculates the total resistance of resistors
             when placed series- and parallel-wise in a circuit.

mf98604@ares:~$ show-code
mf98604@ares:~$ show-code resist.cpp


resist.cpp:


#include <iostream>
#include <limits>

using namespace std;

constexpr streamsize INF_FLAG{numeric_limits<streamsize>::max()};

int main(void)
{
    cout << "\n\t\tWelcome to the Series and Parallel "
            "Circuit Resistance Calculator!\n";

    short value,
          first_value,
          second_value,
          series_resistance;

    bool yes = true;

    char yes_no;

    double parallel_resistance, parallel_resistance_denominator;

    cout << "\nPlease enter the first resistance value in ohms: ";
    cin >> first_value;

    cin.ignore(INF_FLAG, '\n');

    cout << "Please enter the second resistance value in ohms: ";
    cin >> second_value;

    cout << "\nYou entered " << first_value << " ohms and "
         << second_value << " ohms. Calculating...";

    series_resistance = first_value + second_value;

    parallel_resistance = (first_value * second_value) /
                          (static_cast<double>(first_value) +
                           static_cast<double>(second_value));

    cout << "\n\nDone.\n";

    cout << "The total series circuit resistance adds up to "
         << series_resistance << " ohms.\n";
    cout << "The total parallel circuit resistance adds up to "
         << parallel_resistance << " ohms.\n";

    parallel_resistance_denominator = (1 /
                                       static_cast<double>(first_value)) +
                                       (1 /
                                        static_cast<double>(second_value))

    while (yes)
    {
        cin.clear();
        cout << "\nWould you like to add on another resistor? "
                "Enter yes or no: ";
        cin >> yes_no;

        cin.ignore(INF_FLAG, '\n');
        cin.clear();

        if (tolower(yes_no) != 'n')
        {
            yes = true;
            cout << "\nPlease enter the next resistance value in ohms: ";
            cin >> value;
            series_resistance += value;
            parallel_resistance_denominator +=
            (1 / static_cast<double>(value));
            cin.ignore(INF_FLAG, '\n');
        } else
        {
            yes = false;
        }
    }

    parallel_resistance = (1 / parallel_resistance_denominator);

    cout << "\n\nWith the add'l. resistors, "
            "the total series circuit resistance is: "
         << series_resistance;
    cout << "\nWith the add'l. resistors, "
            "the total parallel circuit resistance is: "
         << parallel_resistance;

    cout << "\n\nThanks for using the Series and Parallel "
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                "Circuit Resistance Calculator!\n";

        cout << "\nHave a wonderful day!\n\n";

        return 0;
    }
mf98604@ares:~$ show-code resist.cpp
show-code resist.cpp
CPP resist
resist.cpp***


mf98604@ares:~$ ./resist.out

                Welcome to the Series and Parallel Circuit Resistance Calculator!

Please enter the first resistance value in ohms: 8
Please enter the second resistance value in ohms: 16

You entered 8 ohms and 16 ohms. Calculating...

Done.
The total series circuit resistance adds up to 24 ohms.
The total parallel circuit resistance adds up to 5.33333 ohms.

Would you like to add on another resistor? Enter yes or no: y

Please enter the next resistance value in ohms: 24

Would you like to add on another resistor? Enter yes or no: y

Please enter the next resistance value in ohms: 32

Would you like to add on another resistor? Enter yes or no: y

Please enter the next resistance value in ohms: 48

Would you like to add on another resistor? Enter yes or no: n


With the add'l. resistors, the total series circuit resistance is: 128
With the add'l. resistors, the total parallel circuit resistance is: 3.55556

Thanks for using the Series and Parallel Circuit Resistance Calculator!

Have a wonderful day!

mf98604@ares:~$ ./resist.out

                Welcome to the Series and Parallel Circuit Resistance Calculator!

Please enter the first resistance value in ohms: 0
Please enter the second resistance value in ohms: 25
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You entered 0 ohms and 25 ohms. Calculating...

Done.
The total series circuit resistance adds up to 25 ohms.
The total parallel circuit resistance adds up to 0 ohms.

Would you like to add on another resistor? Enter yes or no: y

Please enter the next resistance value in ohms: 15

Would you like to add on another resistor? Enter yes or no: n


With the add'l. resistors, the total series circuit resistance is: 40
With the add'l. resistors, the total parallel circuit resistance is: 0

Thanks for using the Series and Parallel Circuit Resistance Calculator!

Have a wonderful day!

mf98604@ares:~$ ./resist.out

                Welcome to the Series and Parallel Circuit Resistance Calculator!

Please enter the first resistance value in ohms: 88 ohms
Please enter the second resistance value in ohms: 77 ohms

You entered 88 ohms and 77 ohms. Calculating...

Done.
The total series circuit resistance adds up to 165 ohms.
The total parallel circuit resistance adds up to 41.0667 ohms.

Would you like to add on another resistor? Enter yes or no:
Please enter the next resistance value in ohms: y

Would you like to add on another resistor? Enter yes or no:
Please enter the next resistance value in ohms: 55 ohms

Would you like to add on another resistor? Enter yes or no: n


With the add'l. resistors, the total series circuit resistance is: 220
With the add'l. resistors, the total parallel circuit resistance is: 0

Thanks for using the Series and Parallel Circuit Resistance Calculator!

Have a wonderful day!

mf98604@ares:~$ ./resist.out

                Welcome to the Series and Parallel Circuit Resistance Calculator!

Please enter the first resistance value in ohms: 20
Please enter the second resistance value in ohms: 80

You entered 20 ohms and 80 ohms. Calculating...

Done.
The total series circuit resistance adds up to 100 ohms.
The total parallel circuit resistance adds up to 16 ohms.

Would you like to add on another resistor? Enter yes or no: yes

Please enter the next resistance value in ohms: 20 ohms

Would you like to add on another resistor? Enter yes or no: no


With the add'l. resistors, the total series circuit resistance is: 120
With the add'l. resistors, the total parallel circuit resistance is: 8.88889

Thanks for using the Series and Parallel Circuit Resistance Calculator!

Have a wonderful day!

mf98604@ares:~$ cat resist.tpq

Thought Provoking Questions - Lab 1 -
Series and Parallel Resistance Calculator

1.)

Only one cin input statement is strictly necessary.
However, two are necessary in order for the adjusted formula option.

2.)

The order in which the user inputs the two resistor values matters not.
The commutative property of addition states that
the order of addends can be changed without changing their sum.

3.)

The "welcome" message and the "enter" prompt should be printed
from separate cout statements given that their purposes differ.
The first statement is declarative; the second, interrogative.

4.)

Nothing adverse would happen should the user enter values
on separate lines.
cin considers spaces, tabs, and newlines all whitespace characters.

5.)

In C++ code, parentheses () are used for grouping terms.

6.)

i. Four variables seem reasonable for this program.
ii. A bare minimum would likely be two variables if
    the formula results were not stored in separate variables and
    the calculation were processed in the output statement.
iii. At most, four variables could be used.
     More than four variables would likely be unnecessary.
iv. After adding options, the program now includes additional variables
    necessary for processing further user inputs.

7.)

Zero and negative values are disallowed for Rsub1 and Rsub2,
as a resistance must be of a positive value.
From a mathematical perspective, zero values for Rsub1 and Rsub2
for parallel resistors are restricted as division by zero is undefined.

8.)

Given negative inputs, both series and parallel outputs successfully
calculate according to the formula.
Given an input of '0' for either the first or second values,
the series output will calculate successfully; however,
the parallel output will return a '0'.

Options -

User-Entered-Units

1.)

Unwanted input can be dismissed by calling cin.ignore()
along with the appropriate arguments.

2.)

This facility optionally requires including <limits> in order to
get the maximum value of the stream size
using numeric_limits<streamsize>::max().

3.)

We don't use the string data type in this instance because cin will stop
reading into strings upon encountering a whitespace character.
Furthermore, using strings, desired integer values would need to be parsed
out of the entire inputted string of characters.

Algebraic Exploration

1.)

Floating point exceptions often occur when attempting to divide by zero.
    i. In both cases, the coder most likely neglected to cast
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       the integer input values into floating point data types
       upon calculation.
       In the first case, dividing one by the input integer values results
       in zero, which the program then attempts to divide one by, causing a
       divide-by-zero exception.
    ii. In the second case, since there was no division by zero,
        the program runs successfully; however, the resulting value is
        truncated since integer data types do not hold decimal values.

2.)

Yes, the algebraic rearrangement formula adjustment was worth
the cost of time and effort.

Accumulator Loop

1.)

We can tell that the user is done adding new resistors by simply prompting
the user to enter yes/no before displaying the additional resistor value
input prompts.
With a user input of 'no', or any variation thereof, we can be sure that
the user is done adding on resistors and move on to calculating and displaying
results.

2.)

We can adjust for the fact that the accumulator pattern doesn't work
as easily for reciprocal sums as it does for sums or products
by simply adding new values onto the total sum of denominator reciprocals.
Finally, when we are done adding on new resistor values,
we can find the total parallel resistance by dividing one (1)
by the previously summed-up denominator values.

mf98604@ares:~$ exit
exit

Script done on 2023-09-27 12:18:44-05:00 [COMMAND_EXIT_CODE="0"]
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