Task 2

Aspect	Data
Announcement Date	March 18th
Due Date	March 31st
Marks assigned	10
C++ topics practiced	String processing, Input / Output, Loops / Conditions

Task description

- Calculating the total resistance of a circuit is the first step in analyzing any circuit.
- Finding the total resistance enables us to calculate the current flowing through the circuit.
- In the last task (task 1) you wrote a program to calculate the value of the total resistance.
- Previously the user was able to choose the type of connection by typing **S** for series and **P** for parallel followed by the values of 3 resistances separated by spaces and we assumed that the user will always describe his circuit correctly.
- Well, let's face it not all users are that smart and we must take into consideration user mistakes.
- In this task we will upgrade our Circuit Analyzer so that the user will choose the type of connection by typing **S** for series and **P** for parallel and if the user inserts another value for the connection the program will show a warning message "***Wrong Circuit Description***".
- After choosing the type of connection the user will insert the values of as many resistances as he wants separated by one space followed by an **E** at the end. (Refer to test cases for examples).
- We will assume that the user might get the circuit connection wrong, but he will never forget the E at the end
- The resistances could take any value.
- The user will also provide the value of the voltage applied to the circuit and the program will calculate the current flowing through it.
- The user will provide the circuit description in **one string** as he did in task 1.
- Only one type of connection is allowed (all resistances are either connected in series or parallel).
- Hints:
    - Refer to task 1 if you don't remember how to calculate the total resistance in each case.
    - The function substr() returns a string and can't be compared to a char but can be compared to a string (even if this string consists of 1 character).
    - To get the length of a string, use the length() function:

```
string txt = "ABCDEFGHIJKLMNOPQRSTUVWXYZ";
int x = txt.length();
cout << "The length of the txt string is: " << x;
```

Test cases

1. **Circuit description:** *S 1.5 12.85 3.6 5 6.6 7 E*
   Voltage applied: *3.8*
2. **Circuit description:** *L 2.5 5.2 E*
   Voltage applied: 9
3. **Circuit description:** *P 1.4 2.26 3 E*
   Voltage applied: *7*
4. **Circuit description:** *S 9 E*
   Voltage applied: *9*
5. **Circuit description:** *Z 8.2 3.1 1.3 7.8 E*
   Voltage applied: *5*
6. **Circuit description:** *P 8.2 3.1 1.3 7.8 E*
   Voltage applied: *5*

Data in italic are user input values.

Grading rubric

• The circuit description is recorded in one string.	1 Mark
• The program can process the connection type and all resistance values.	4 Marks
• The program can calculate the total resistance in both cases	3 Marks
• The program shows the error message when connection type is wrong	1 Mark
• The program can calculate the circuit current.	1 Marks

Submission procedure

- Upload a copy of your code in one pdf file along with screenshots of the previous test cases provided on LMS.

General Instructions

Topic	Rule / Guideline
Assistance of the teaching team	- Get access to team from MS Teams – channel of "Capstone Project", any communication out of this channel will be neglected. - TAs will not respond to any question regarding the project out of this channel. - TAs will have announced time to be available for live communication – they will also reply offline to questions in their live time
Submission	- No accepted submission after the task due time - All submission should be in the portal. - Plagiarism is prohibited and a plagiarized submission will result in a zero and a first strike. - Two plagiarized submissions will result in failure in the whole project.