

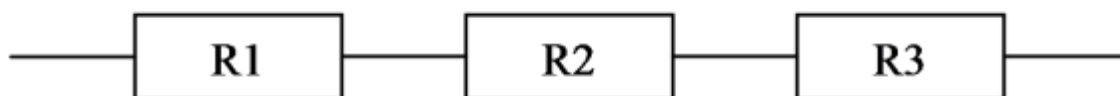
# Task 1

Aspect	Data
Announcement Date	March 11 <sup>th</sup>
Due Date	March 17 <sup>th</sup>
Marks assigned	10
C++ topics practiced	String processing, Input / Output

## Task description

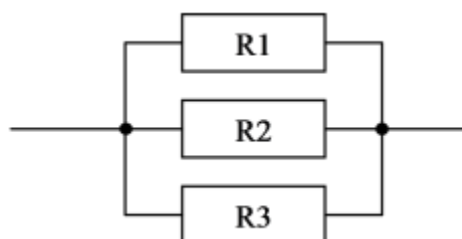
- Calculating the total resistance of a circuit is the first step in analyzing any circuit.
- Finding the total resistance enables us to calculate the current flowing through the circuit.
- To calculate the total overall resistance of several resistors connected in series you add up the individual resistances.
- This is done using the following formula:

$$R_{total} = R_1 + R_2 + R_3$$



- To calculate the total overall resistance of several resistors connected in parallel can use the following formula:

$$\frac{1}{R_{total}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$



- Design a C++ program that gets the circuit description from the user regarding the value of resistances and their connection and returns the value of the total resistance.
- 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**.
- Only one type of connection is allowed (all resistances are either connected in series or parallel).



- The user will choose the type of connection by typing **S** for series and **P** for parallel followed by the values of 3 resistances separated by spaces. (Refer to test cases for examples).
- Calculate the circuit current using Ohm's law

$$V = IR$$

- Hints:
  - Using `getline( )` will read the spaces in user input string.
  - Example:
 

```
string str;
cout << "Please enter your name: \n";
getline(cin, str);
cout << "Hello, " << str;
```
  - Using `stof( )` will convert a string into a float value.
  - Example:
 

```
// String to be parsed
string str = "1000";
// val to store parsed float type number
float val = stof(str);
// Printing parsed float type number
cout << val;
```

### Test cases

1. **Circuit description:** *S 1 2 3*  
**Voltage applied:** 3
2. **Circuit description:** *P 2 2 2*  
**Voltage applied:** 6
3. **Circuit description:** *S 4 2 6*  
**Voltage applied:** 7
4. **Circuit description:** *P 9 1 4*  
**Voltage applied:** 9
5. **Circuit description:** *S 8 3 3*  
**Voltage applied:** 5

*Data in italic are user input values.*

### Grading rubric

• The circuit description is recorded in one string.	2 Marks
• The program can process the connection type and the resistance values.	3 Marks
• The program can calculate the total resistance.	3 Marks
• The program can calculate the circuit current.	2 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
<b>Assistance of the teaching team</b>	<ul style="list-style-type: none"><li>- Get access to team from MS Teams – channel of “Capstone Project”, any communication out of this channel will be neglected.</li><li>- TAs will have announced time to be available for live communication – they will also reply offline to questions in their live time</li></ul>
<b>Submission</b>	<ul style="list-style-type: none"><li>- No accepted submission after the task due time</li><li>- All submission should be in the portal.</li><li>- Plagiarism is prohibited and a plagiarized submission will result in a zero and a first strike.</li><li>- Two plagiarized submissions will result in failure in the whole project.</li></ul>