

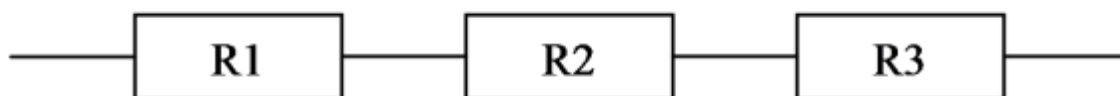
Task 1

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

Task description

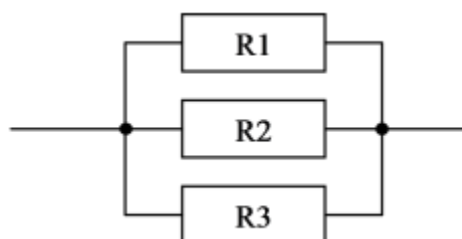
- Calculating the total resistance of a circuit is the first step in analyzing any circuit.
- Finding the total resistance enables us to calculate the current flowing through the circuit.
- To calculate the total overall resistance of several resistors connected in series you add up the individual resistances.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

- Submit your code on Codeforces.
- Attach a copy of your code in one pdf file along with screenshots of the two test cases provided.



General Instructions

Topic	Rule / Guideline
Assistance of the teaching team	<ul style="list-style-type: none">- Get access to team from MS Teams – channel of “Capstone Project”, any communication out of this channel will be neglected.- TAs will have announced time to be available for live communication – they will also reply offline to questions in their live time
Submission	<ul style="list-style-type: none">- 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.