

**A. The resistor program, again**

Let's improve the resistor-calculating program that was used in a previous lab. Write, run, and demo a C program that:

1. Asks the user if this will be a series or parallel resistor calculation. The user responds using a single character input, either 's' or 'p'.
2. Then the program asks how many resistors will be in the series or parallel calculation. The possible options are 2 through 5. (Note that this question must include the word "series" or "parallel", depending on the answer given for part 1.) The user responds with the desired number.
3. The program asks the user to enter the values of the resistors to be used in the calculation. The values should be given in ohms. (The prompt should make clear that the values should be in ohms.)
4. The program calculates and outputs the correct answer. (The output should be nicely formatted and include the units.)

Notes: (a) This version of the program must be done with a series of `if-else` statements. (b) For the series combination,  $R_S = \Sigma R_n$  and for the parallel combination,  $(R_P)^{-1} = \Sigma (R_n)^{-1}$ , where  $R_n$  represents the various values of the individual resistors.

**B. The resistor program, yet again**

Write a second version of your program from Part A, but this time use a `switch` statement instead of the sequence of `if-else` statements. This is the only difference, and from the user's point of view, the two programs should behave identically.

**C. Arithmetic Practice**

Some young relative is learning to do addition in grade school and would like some help from you. Write, run, and demo a C program that:

1. Generates two random integers, within the range of 1 to 25.
2. Prints out a question asking the student to add the two numbers.
3. The student then responds with an answer.
4. The program checks the answer, and then tells the student if the problem was solved correctly. If the student's answer was wrong, the program should provide the correct answer.

**D. Quiz**

Finally, there will a short quiz on if-else statement.

**“Reporting”**

The three programs can be written prior to lab. You can demo the programs on your own laptop brought to lab or using VirtualBox in the lab room — it’s your choice. Your instructor will first ask you to demonstrate one of the programs. A correctly functioning program will earn 15 points. The instructor will then ask you to make one or two modifications to your program. Then you will demo the modified program. If you successfully modify the program, then you will earn an extra 10 points for a total of 25 for the program. You should then print out and submit a written copy of your original program. (You can print out your original version prior to lab, if you are 100% sure that it works properly.)

The process is then repeated for the other program, which are also worth 25 points.

The quiz is worth 25 points, so that the entire lab is worth 100 points.