

# Programming Project #1

## EGRE245 Fall 2017

### Calculating Parallel Resistance

## 1 Overview

The formula for the effective resistance  $R$  of  $n$  resistors in parallel is

$$\frac{1}{R} = \frac{1}{r_1} + \frac{1}{r_2} + \dots + \frac{1}{r_n}$$

Write a complete C program that inputs from the keyboard the value of 3 resistors (in kohms) and then prints to the screen a simple diagram of the system plus the effective resistance of the 3 resistors connected in parallel. Make sure you prompt the user for all input and that you label all of your output; you should do this for all applicable programs this semester. Also be sure to echo print to the screen the values that have been entered.

Project #1's code is given to you below; you are to input it *exactly* as it is shown (with the exception that you would of course replace the 2 occurrences of my name with yours!). Don't worry that the diagram will only format correctly for up to three-digit input. You should make sure, however, that your output matches the sample run below with the input given.

## 2 The Code

```
/* Project #1
   EGRE245 Fall 2017
   D. Resler */

#include <stdio.h>

int main(void) {
    float r1,r2,r3;
    printf("Proj. #1 - D. Resler\n");
    printf("Enter the value of 3 resistors connected in parallel (in kohms)\n");
    printf(" #1: ");
    scanf("%f",&r1);
    printf(" value entered: %f\n",r1);
    printf(" #2: ");
    scanf("%f",&r2);
    printf(" value entered: %f\n",r2);
    printf(" #3: ");
    scanf("%f",&r3);
    printf(" value entered: %f\n",r3);
    printf("\n");
    printf("      |----- %6.2f kohms -----|\n",r1);
    printf("----|----- %6.2f kohms -----|----\n",r2);
    printf("      |----- %6.2f kohms -----|\n",r3);
    printf("\n");
}
```

```

    printf("Effective resistance: %f kohms\n",1.0/(1.0/r1 + 1.0/r2 + 1.0/r3));
    return 0;
}

```

### 3 Project Documentation

The very first lines in *all* of your programming project files this semester should be comments giving general information about the project, class, author using the following format (you of course will *use your name* instead of mine):

```

/* Project #1
   EGRE245 Fall 2017
   D. Resler */

```

In addition, the first output for *all* of your projects this semester should be the name of the project and your name, e.g.

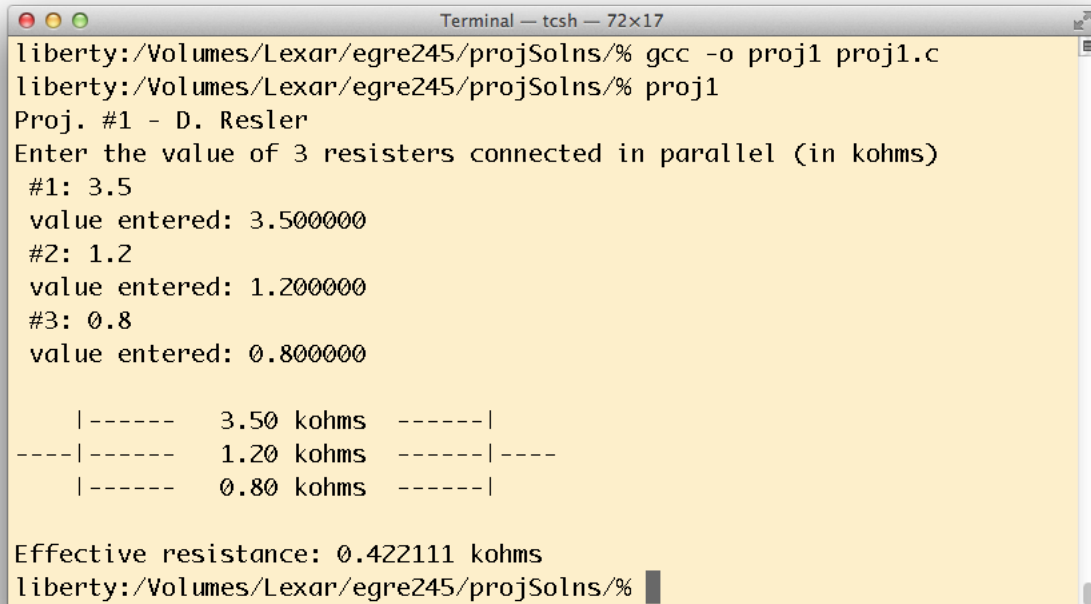
```

/* ... */
main() {
    printf("Proj. #1 - D. Resler\n");
    /* ... */
}

```

Again, **be sure to use your name instead of mine!**

## 4 Sample Run



```
Terminal — tcsh — 72x17
liberty:/Volumes/Lexar/egre245/projSolns/% gcc -o proj1 proj1.c
liberty:/Volumes/Lexar/egre245/projSolns/% proj1
Proj. #1 - D. Resler
Enter the value of 3 resistors connected in parallel (in kohms)
#1: 3.5
value entered: 3.500000
#2: 1.2
value entered: 1.200000
#3: 0.8
value entered: 0.800000

| ----- 3.50 kohms -----|
----| ----- 1.20 kohms -----|----
| ----- 0.80 kohms -----|

Effective resistance: 0.422111 kohms
liberty:/Volumes/Lexar/egre245/projSolns/%
```

## 5 Deliverables

You should turn in a stand-alone, complete application program (your C source code, a single file) containing a `main` function. Name your source code file `proj1XXXX.c` where `XXXX` is the last 4 digits of your student id number. For example, if your student id number is V12345678, your file will be named `proj15678.c`. Projects this term will be submitted via the web using a link off of the class web page (<http://danresler.net/egre245>). Be sure to keep a receipt of your file submission. Note you need not turn in an executable file!

**Due date: Thursday, August 31**