

Programming Project #1

EGRE 245 Spring 2015

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 my name with yours). Don't worry that the diagram will only format correctly for up to three-digit input.

2 The Code

```
/* Project #1
   EGRE245 Fall 2014
   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):

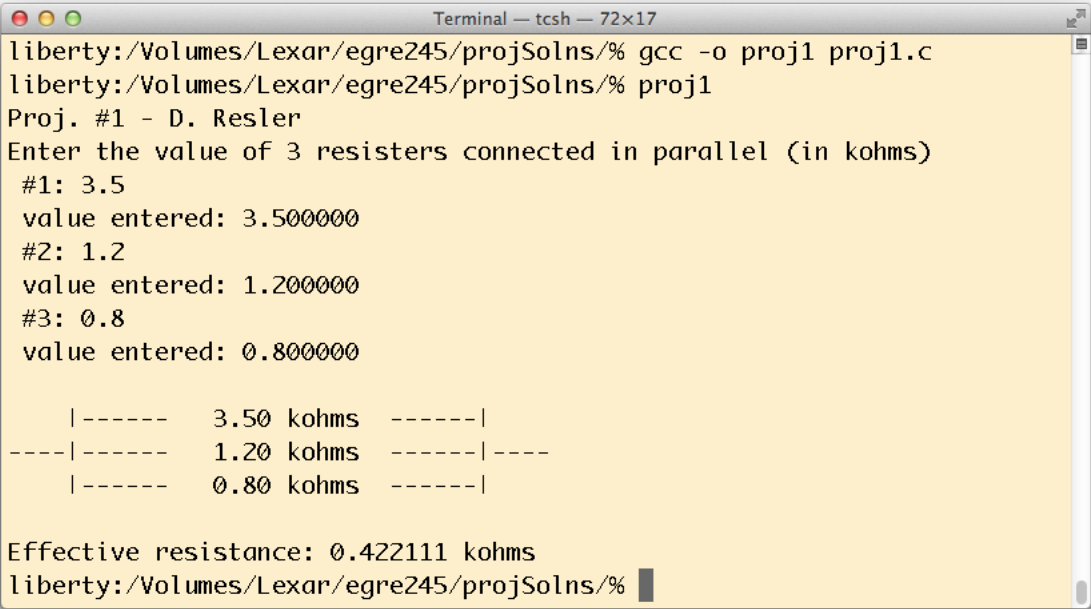
```
/* Project #1
   EGRE245 Fall 2014
   D. Resler */
```

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, January 22