INTRODUCTION TO THE C COMPILER

LAB 2
SECTION B

SUBMITTED BY:

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Problem

The purpose of this lab was to become familiar with the GCC compiler using the Gygwin terminal interface. Students also started to become familiar with a text editor of their choice and practiced basic C programming as covered in lectures.

Analysis

Lab2-1.c had no user inputs and simply printed some information to the display such as the name of the student, the name of the class and the current date. No inputs are needed.

Lab2-2.c was designed to calculate the area of a rectangle with the dimensions x by y. The user needs to input a length and a width (x and y) and the area of a rectangle with the given dimensions was printed to the display. The relationship between the inputs x and y and the output are as follows: output = x * y.

Lab2-3.c was designed to calculate the volume of a rectangular prism with the dimensions x by y by z. The user needs to input values for length, width and height of the prism (x, y and z) and the volume of the prism will be printed to the display. The relationship between the inputs x, y and z and the output are as follows: output = x * y * z.

Design

First, three variables need to be declared; one for each height, width and length. These variables are user inputs, so the best solution would be the *scanf( )* function. To tell the

user what information to input a *prinf()* statement will be used. The program will have a *printf()* statement describing the input followed by a *scanf()* statement to collect the input and assign it to the correct variable. Lab2-2.c will have two of these blocks of code (one for height and one for width) while lab2-3.c will have three (an additional bock for length). The calculation is a simple arithmetic equation (x * y and x * y * z) and only happens once. To improve efficiency and increase readability the calculation will be held in the final *printf()* statement rather than in its own variable. A *printf()* statement at the end of the program will display the dimensions of the shape as well as the calculated area/volume.

Testing

The only testing needed for lab2-1.c is to run the program and check the display for the correct output.

To test lab2-2.c and lab2-3.c, use several different numbers for height and width (and length if necessary). Use a range of numbers for each of the dimensions and check to make sure that the result printed to the display is correct by using the equations *Area = Height * Width* and *Volume = Height * Width * Length*.

Comments

This lab was a review of code demonstrated in the lectures. No problems were encountered because of previous independent practice. There is nothing I would change about the design of my programs or how they were executed.
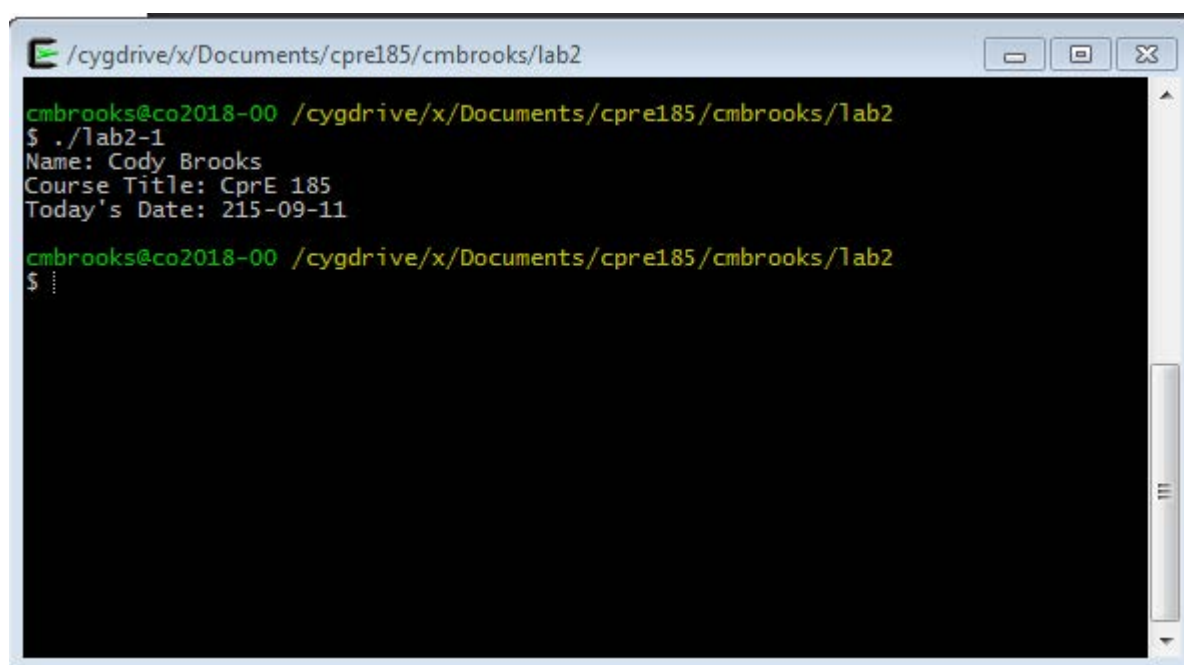
```c
#include <stdio.h>

int main (int argc, char* argv[]) {

    printf("Name: Cody Brooks\n");
    printf("Course Title: CprE 185\n");
    printf("Today's Date: 215-09-11\n");

    return 0;

}
```

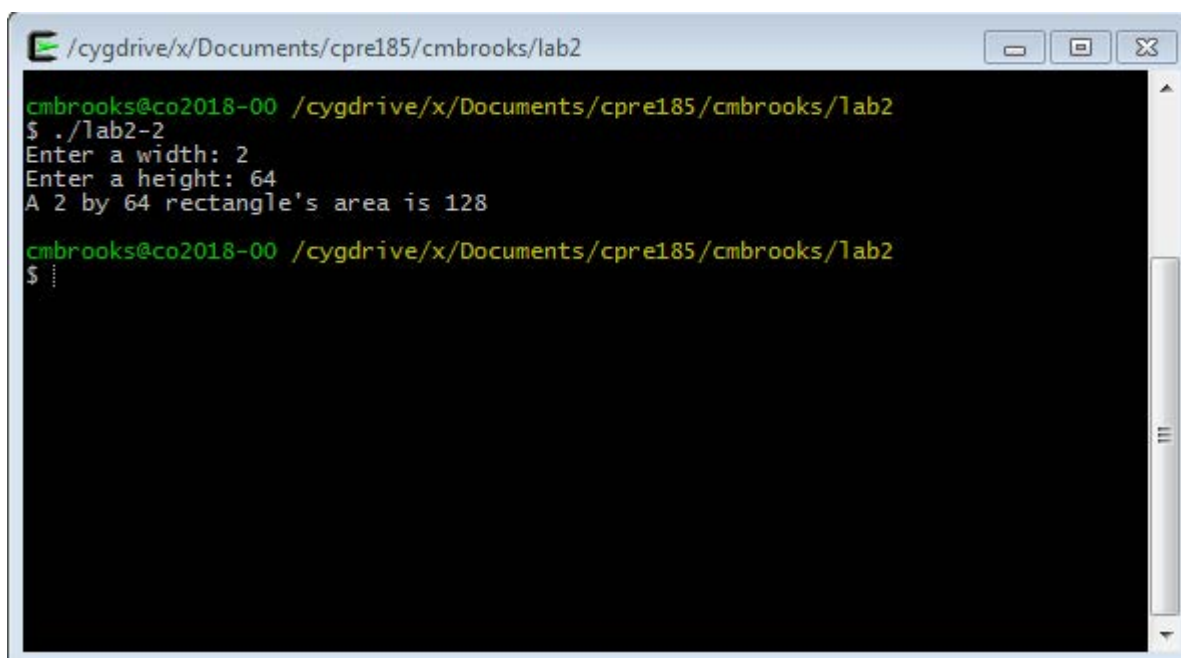```c
#include <stdio.h>

int main (int argc, char* argv[]) {

    int x,y;

    printf("Enter a width: ");
    scanf("%d", &x);
    printf("Enter a height: ");
    scanf("%d", &y);
    printf("A %d by %d rectangle's area is %d\n", x, y, x * y);

    return 0;

}
```

```
/cygdrive/x/Documents/cpre185/cmbrooks/lab2

cmbrooks@co2018-00 /cygdrive/x/Documents/cpre185/cmbrooks/lab2
$ ./lab2-2
Enter a width: 2
Enter a height: 64
A 2 by 64 rectangle's area is 128

cmbrooks@co2018-00 /cygdrive/x/Documents/cpre185/cmbrooks/lab2
$
```

```c
#include <stdio.h>

int main (int argc, char* argv[]) {

    int x, y, z;

    printf("Enter a width: ");
    scanf("%d", &x);
    printf("Enter a height: ");
    scanf("%d", &y);
    printf("Enter a length: ");
    scanf("%d", &z);
    printf("A %d by %d by %d rectangular prism's volume is %d\n", x, y, z, x * y * z);

    return 0;

}
```
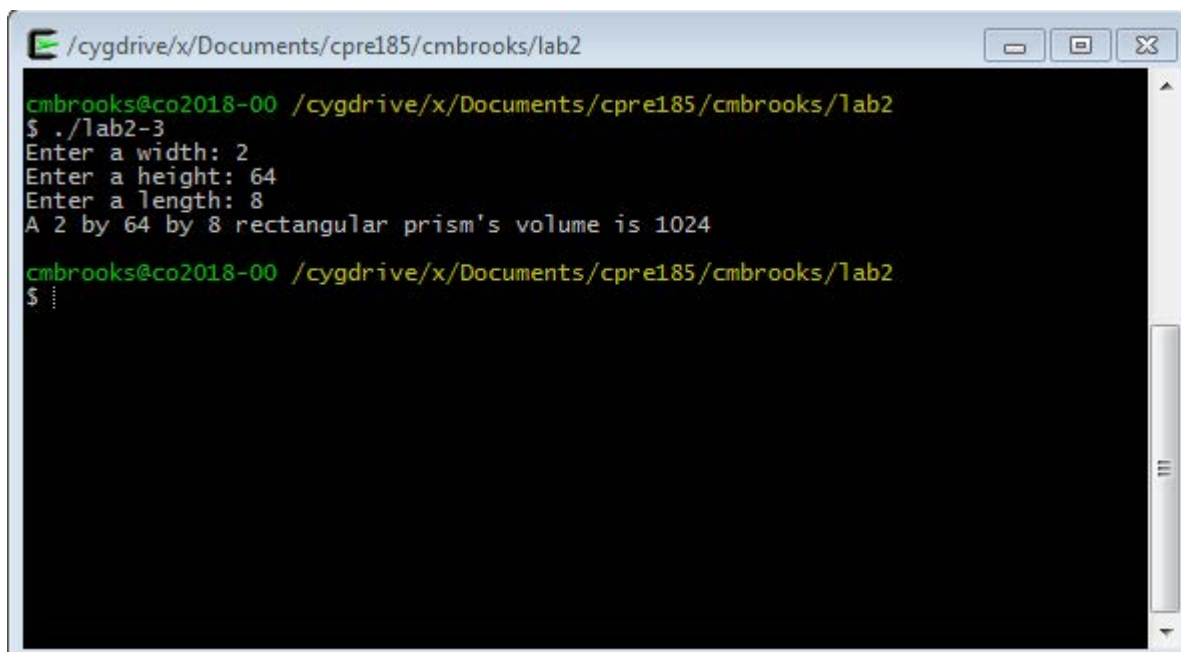
```
/cygdrive/x/Documents/cpre185/cmbrooks/lab2

cmbrooks@co2018-00 /cygdrive/x/Documents/cpre185/cmbrooks/lab2
$ ./lab2-3
Enter a width: 2
Enter a height: 64
Enter a length: 8
A 2 by 64 by 8 rectangular prism's volume is 1024

cmbrooks@co2018-00 /cygdrive/x/Documents/cpre185/cmbrooks/lab2
$
```