TITLE

Solving Simple Problems in C

LAB # 02

SECTION # 8

FULL NAME

Adam Jennissen

SUBMISSION DATE:

9/8/2022

DATE

9/8/2022

Problem

The purpose of this lab was to solve multiple different problems. Most of the problems were different types of simple math. They were taking input and finding the area of a rectangle and volume of a cube, fixing a programs output, creating math formulas for area of a circle given circumference, converting feet to meters, and converting Fahrenheit to Celsius. The final problem was creating a program that uses the Pythagorean Theorem.

Analysis

For the problems I had to find the correct formulas and figure out how to get the program to do the math in the correct order. I needed to convert from circumference back to radius then use radius to find the area. For the Fahrenheit Celsius problem, I had to make sure it did the subtraction first, then the multiplication and division. For the Pythagorean Theorem problem, I had to square two numbers, then add them, then take the square root of them.

Design

The first problem had two parts, the first part I took in the input of width and height and output the area of a rectangle (2). For the second part, I did the same thing, but I also took in input of the length, and output the area of a cube (3). Problem 3 required fixing code that was not working right (4). Two of the outputs were wrong, because of a wrong type specifier, and the middle output was wrong, because the variable was not put in for the second argument of the print statement. For the fourth problem, there was a list of math operations and some of them do not output correctly (5). C, E, F, and I do not output correctly because there is integer division in it, meaning that it does not take the remainder. For the Pythagorean Theorem problem, I took input for a and b and then created one equation to find c (7).

Testing

To make sure that my Pythagorean Theorem program worked correctly, I first input, 3 and 4, which output 5. I did this because they are a Pythagorean triple so I knew the output should be 5. I then put in 3.0 and 4.0, and I got 5.0 out. I put these in to make sure that putting in a decimal did not break my program. Finally, I put it the numbers we were told to in the problem, 5 and 9, and I got 10.295630 (7). I checked an online calculator to make sure that was correct.

Comments

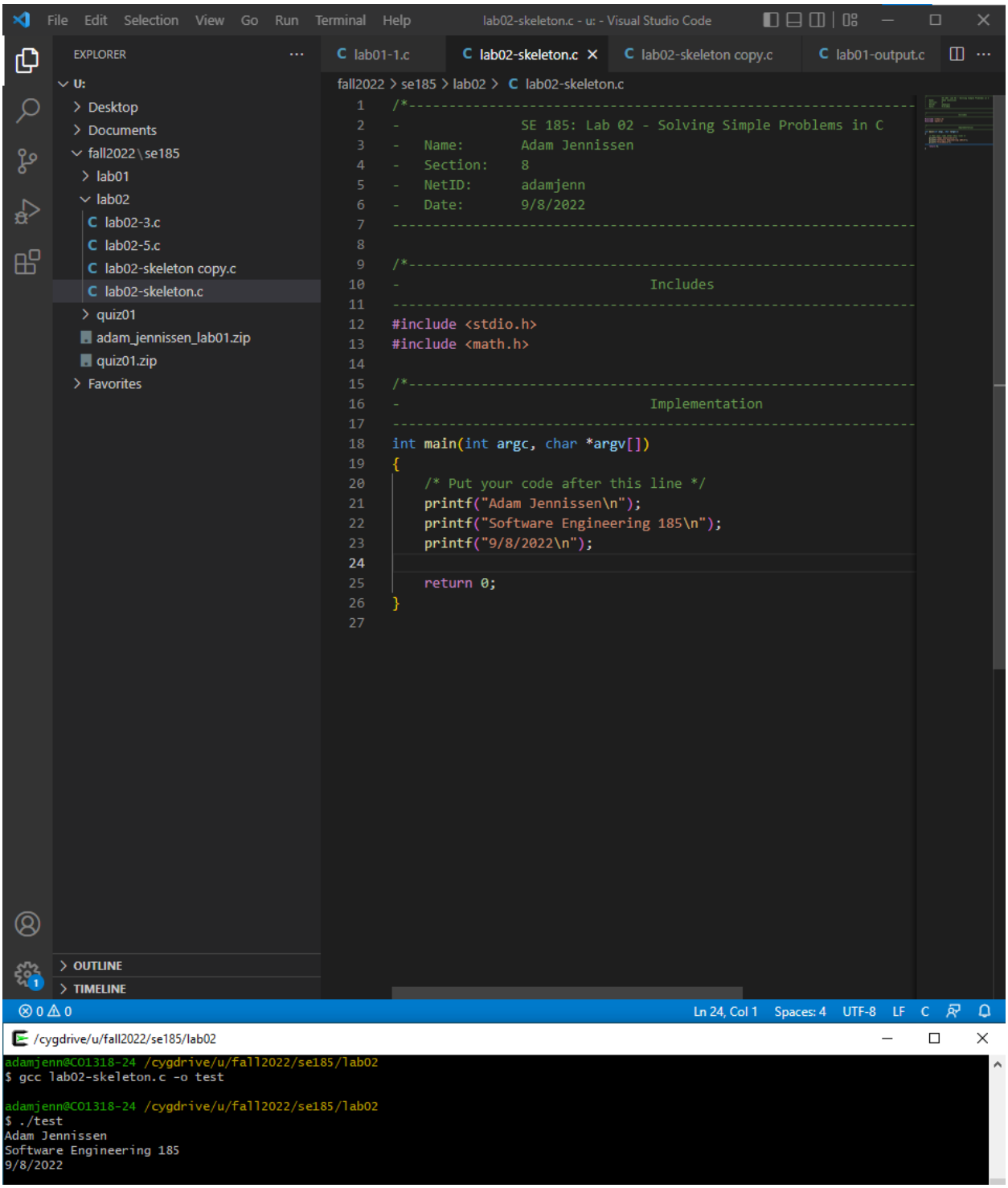
Throughout this lab I made multiple mistakes that I learned from. For example, in my Pythagorean Theorem program when I put in 3.0 and 4.0, it did not work the first time, because of my input statements. To fix this I put a space before the %lf in my second input so that it did not go to a

new line when I pressed enter, we learned this in class, but I learned how to actually use it. I also got a better understanding of integer division after figuring out which equations did not give the right answer in the fourth problem.

Screen Shots

<Number the screenshots and paste here. The point of numbering the screenshots is so that you can refer to them during your discussion in the various parts above. Alternatively, you can include the screenshots in-line with the text above as part of your discussion.>

1.


File Edit Selection View Go Run Terminal Help
lab02-skeleton.c - u: - Visual Studio Code
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Favorites
lab01-1.c
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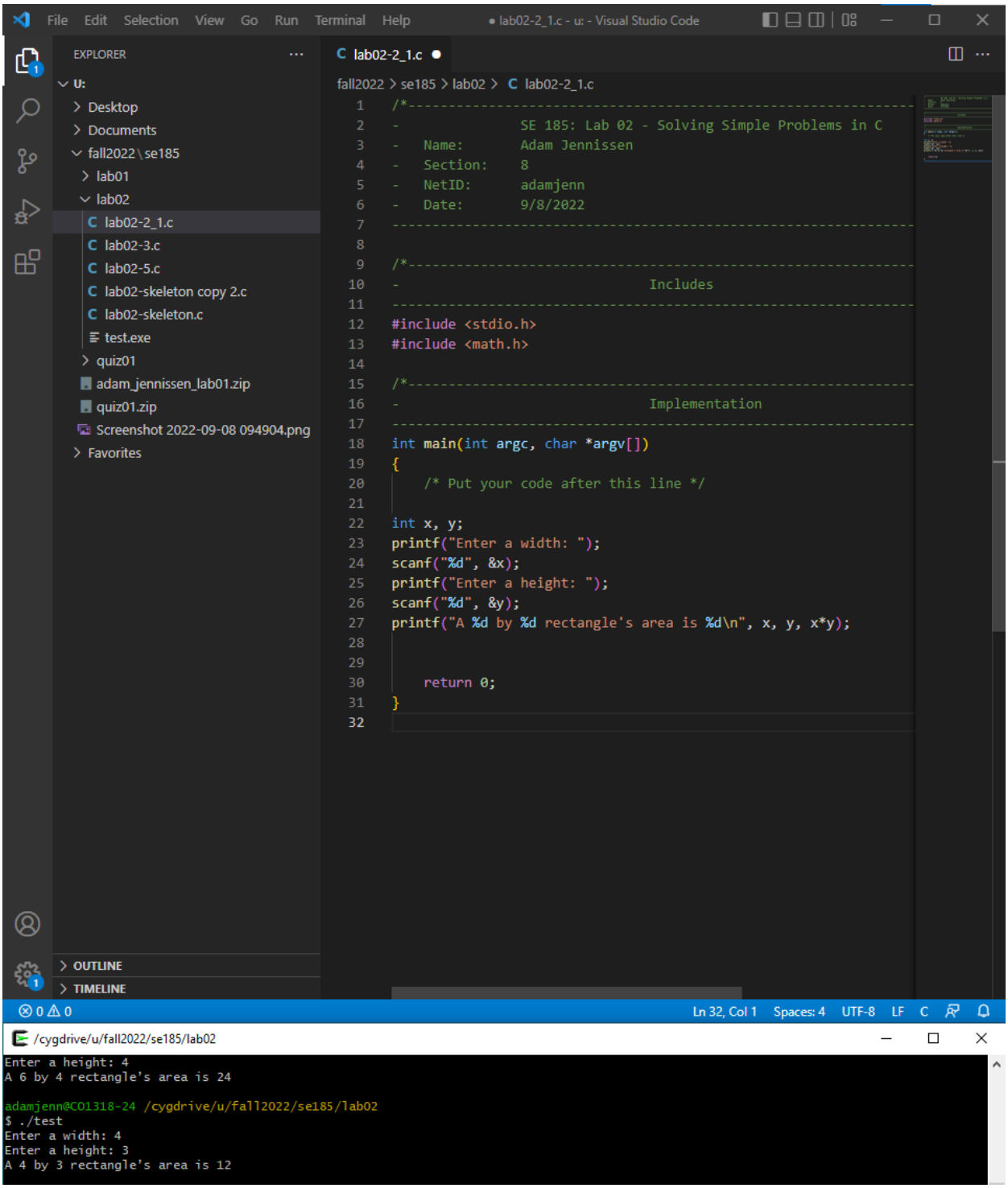
lab01-output.c
fall2022 > se185 > lab02 > lab02-skeleton.c
1 /*----------
2 - SE 185: Lab 02 - Solving Simple Problems in C
3 - Name: Adam Jennissen
4 - Section: 8
5 - NetID: adamjenn
6 - Date: 9/8/2022
7 ----------
8
9 /*----------
10 - Includes
11 ----------
12 #include <stdio.h>
13 #include <math.h>
14
15 /*----------
16 - Implementation
17 ----------
18 int main(int argc, char *argv[])
19 {
20 /* Put your code after this line */
21 printf("Adam Jennissen\n");
22 printf("Software Engineering 185\n");
23 printf("9/8/2022\n");
24
25 return 0;
26 }
27
OUTLINE
TIMELINE
0 0
Ln 24, Col 1 Spaces: 4 UTF-8 LF C
/cygdrive/u/fall2022/se185/lab02
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ gcc lab02-skeleton.c -o test
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
Adam Jennissen
Software Engineering 185
9/8/2022

2.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lab02-2_1.c
fall2022 > se185 > lab02 > lab02-2_1.c
1 /*----------
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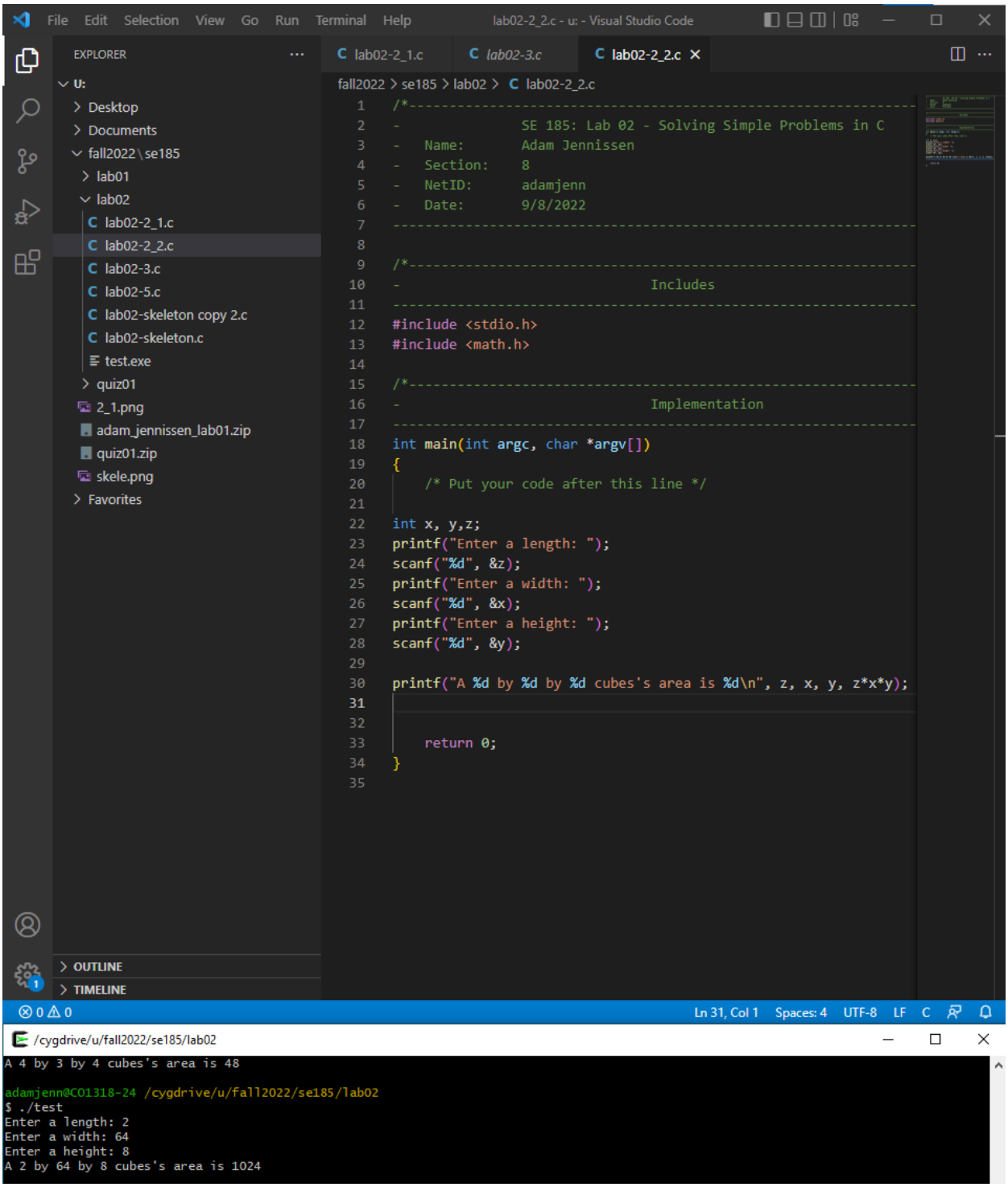
3 - Name: Adam Jennissen
4 - Section: 8
5 - NetID: adamjenn
6 - Date: 9/8/2022
7 ----------
8
9 /*----------
10 - Includes
11 ----------
12 #include <stdio.h>
13 #include <math.h>
14
15 /*----------
16 - Implementation
17 ----------
18 int main(int argc, char *argv[])
19 {
20 /* Put your code after this line */
21
22 int x, y;
23 printf("Enter a width: ");
24 scanf("%d", &x);
25 printf("Enter a height: ");
26 scanf("%d", &y);
27 printf("A %d by %d rectangle's area is %d\n", x, y, x*y);
28
29
30 return 0;
31 }
32
⊗ 0 ⚠ 0
Ln 32, Col 1 Spaces: 4 UTF-8 LF C
/cygdrive/u/fall2022/se185/lab02
Enter a height: 4
A 6 by 4 rectangle's area is 24
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
Enter a width: 4
Enter a height: 3
A 4 by 3 rectangle's area is 12

3.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1 /*----------
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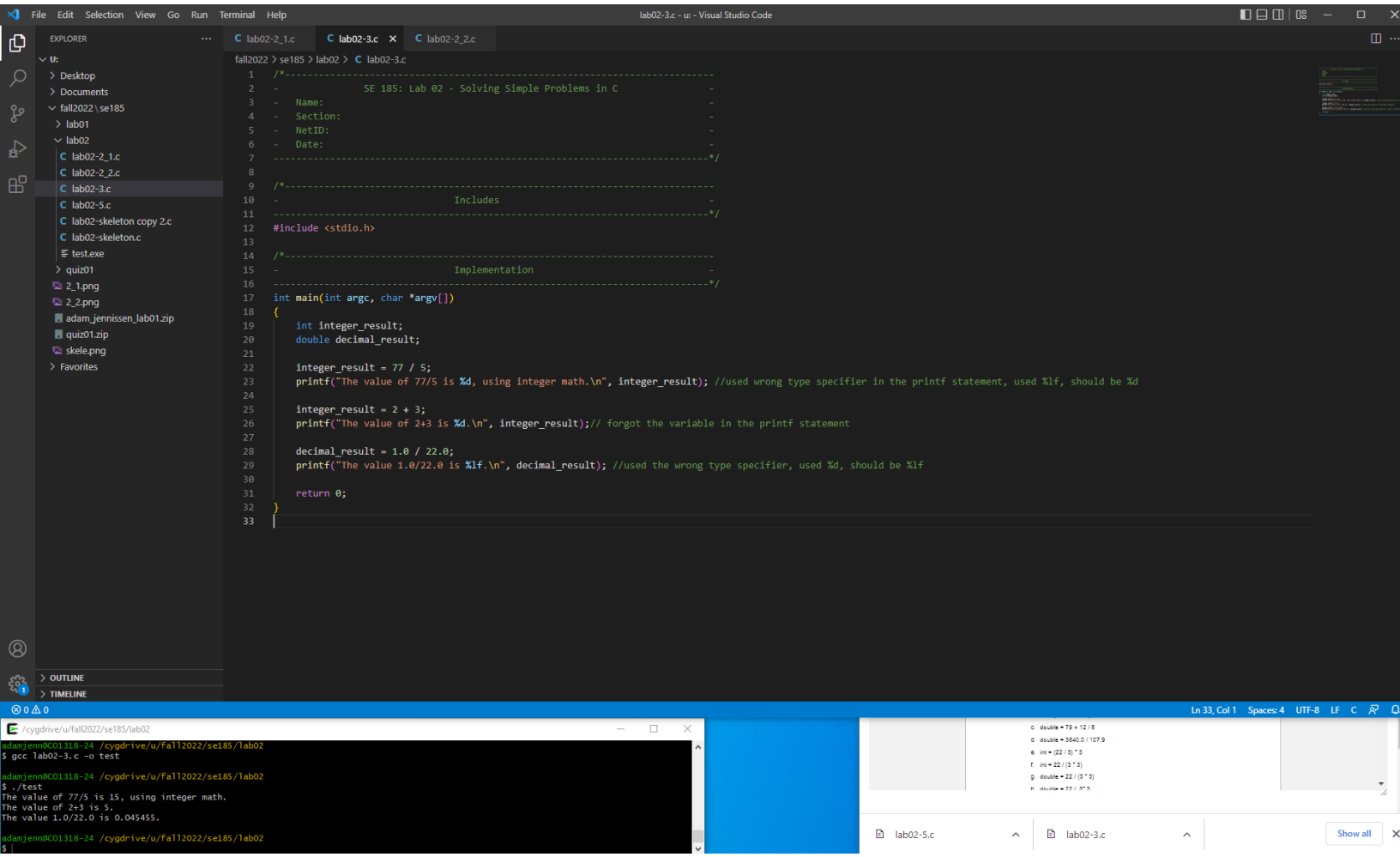
4 - Section: 8
5 - NetID: adamjenn
6 - Date: 9/8/2022
7 ----------
8
9 /*----------
10 - Includes
11 ----------
12 #include <stdio.h>
13 #include <math.h>
14
15 /*----------
16 - Implementation
17 ----------
18 int main(int argc, char *argv[])
19 {
20 /* Put your code after this line */
21
22 int x, y,z;
23 printf("Enter a length: ");
24 scanf("%d", &z);
25 printf("Enter a width: ");
26 scanf("%d", &x);
27 printf("Enter a height: ");
28 scanf("%d", &y);
29
30 printf("A %d by %d by %d cubes's area is %d\n", z, x, y, z*x*y);
31
32
33 return 0;
34 }
35
0 0
Ln 31, Col 1 Spaces: 4 UTF-8 LF C
/cygdrive/u/fall2022/se185/lab02
A 4 by 3 by 4 cubes's area is 48
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
Enter a length: 2
Enter a width: 64
Enter a height: 8
A 2 by 64 by 8 cubes's area is 1024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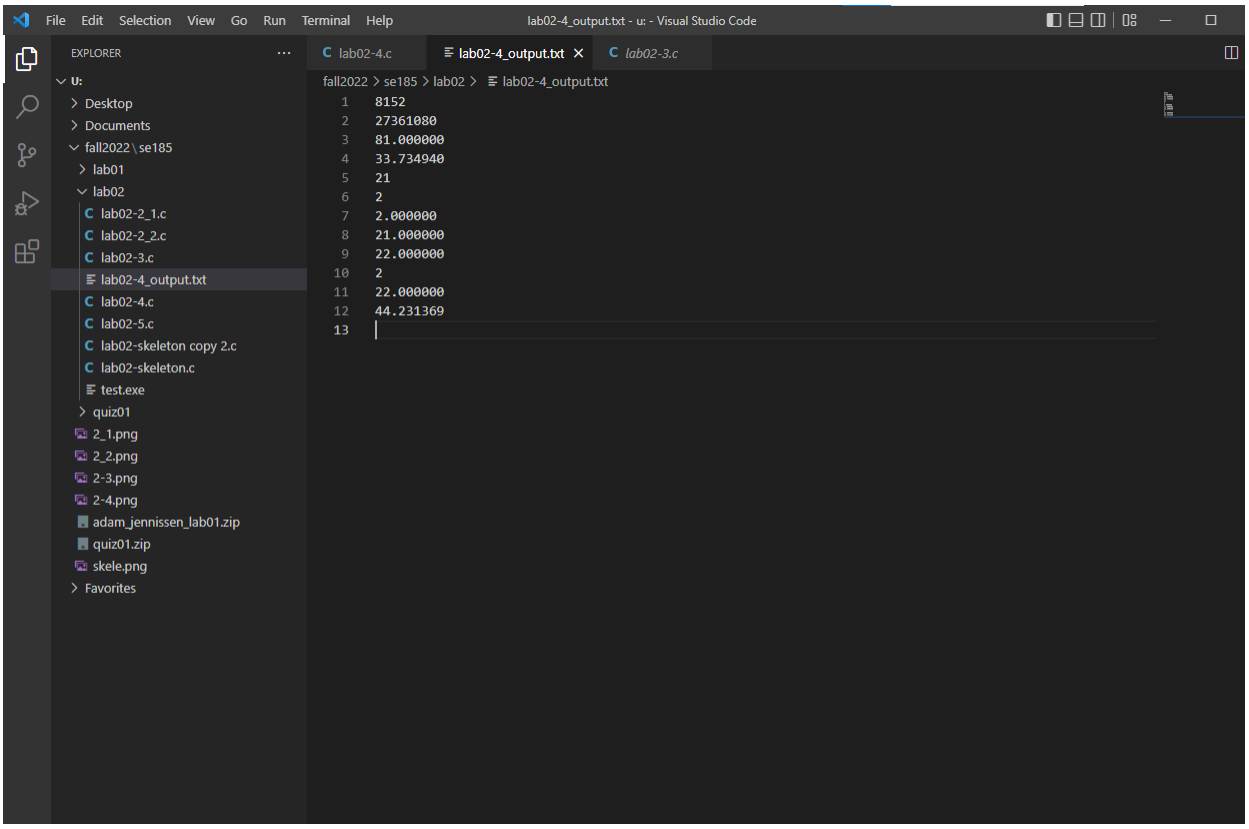
/*--
- SE 185: Lab 02 - Solving Simple Problems in C -
- Name: -
- Section: -
- NetID: -
- Date: -
--*/
/*--
- Includes -
--*/
#include <stdio.h>
/*--
- Implementation -
--*/
int main(int argc, char *argv[])
{
int integer_result;
double decimal_result;
integer_result = 77 / 5;
printf("The value of 77/5 is %d, using integer math.\n", integer_result); //used wrong type specifier in the printf statement, used %lf, should be %d
integer_result = 2 + 3;
printf("The value of 2+3 is %d.\n", integer_result);// forgot the variable in the printf statement
decimal_result = 1.0 / 22.0;
printf("The value 1.0/22.0 is %lf.\n", decimal_result); //used the wrong type specifier, used %d, should be %lf
return 0;
}
Ln 33, Col 1 Spaces: 4 UTF-8 LF C
/cygdrive/u/fall2022/se185/lab02
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ gcc lab02-3.c -o test
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
The value of 77/5 is 15, using integer math.
The value of 2+3 is 5.
The value 1.0/22.0 is 0.045455.
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$
lab02-5.c
lab02-3.c
Show all

4.

5.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lab02-4_output.txt
lab02-3.c
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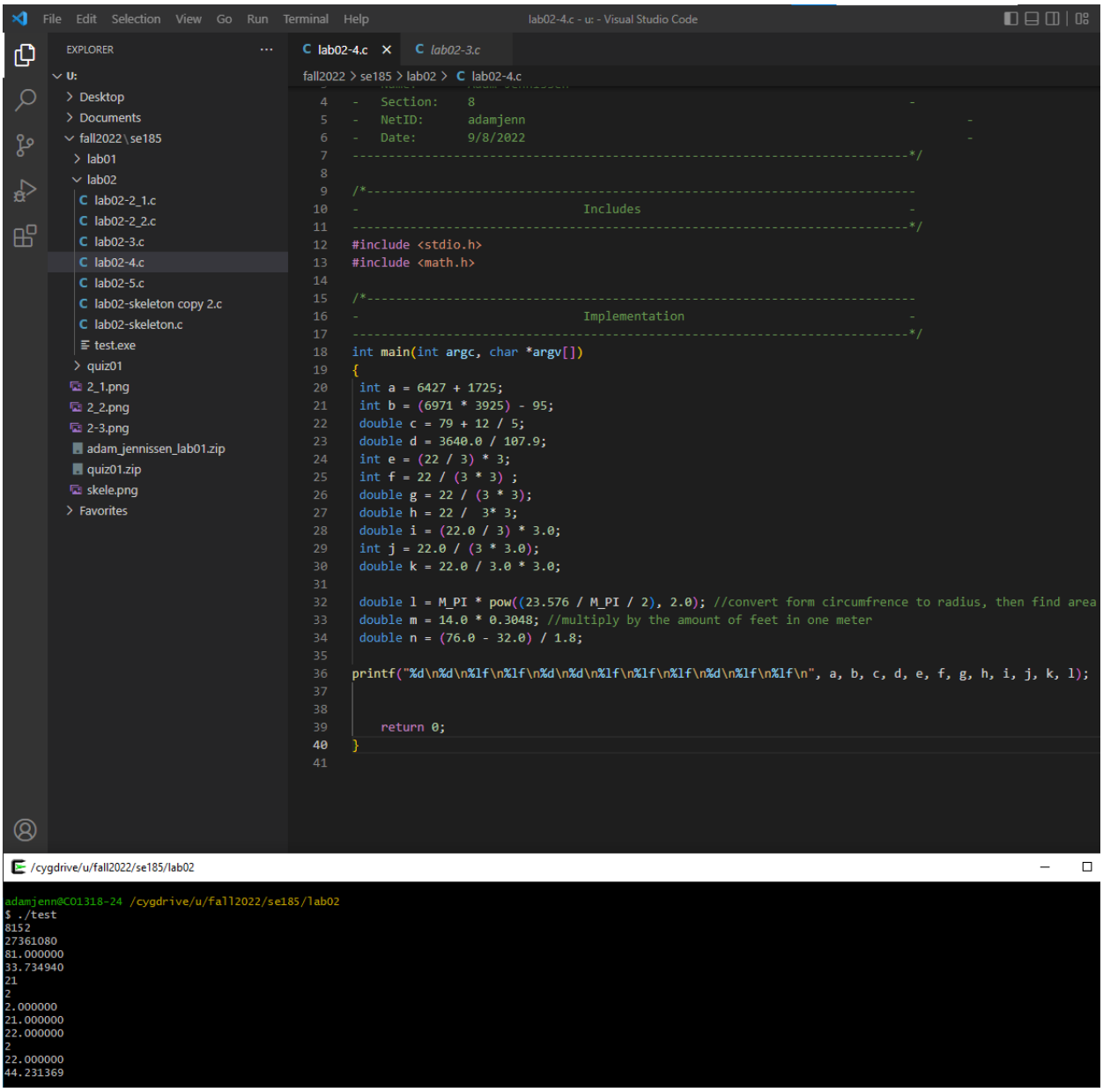
1 8152
2 27361080
3 81.000000
4 33.734940
5 21
6 2
7 2.000000
8 21.000000
9 22.000000
10 2
11 22.000000
12 44.231369
13

6.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lab02-2_2.c
lab02-3.c
lab02-4.c
lab02-5.c
lab02-skeleton copy 2.c
lab02-skeleton.c
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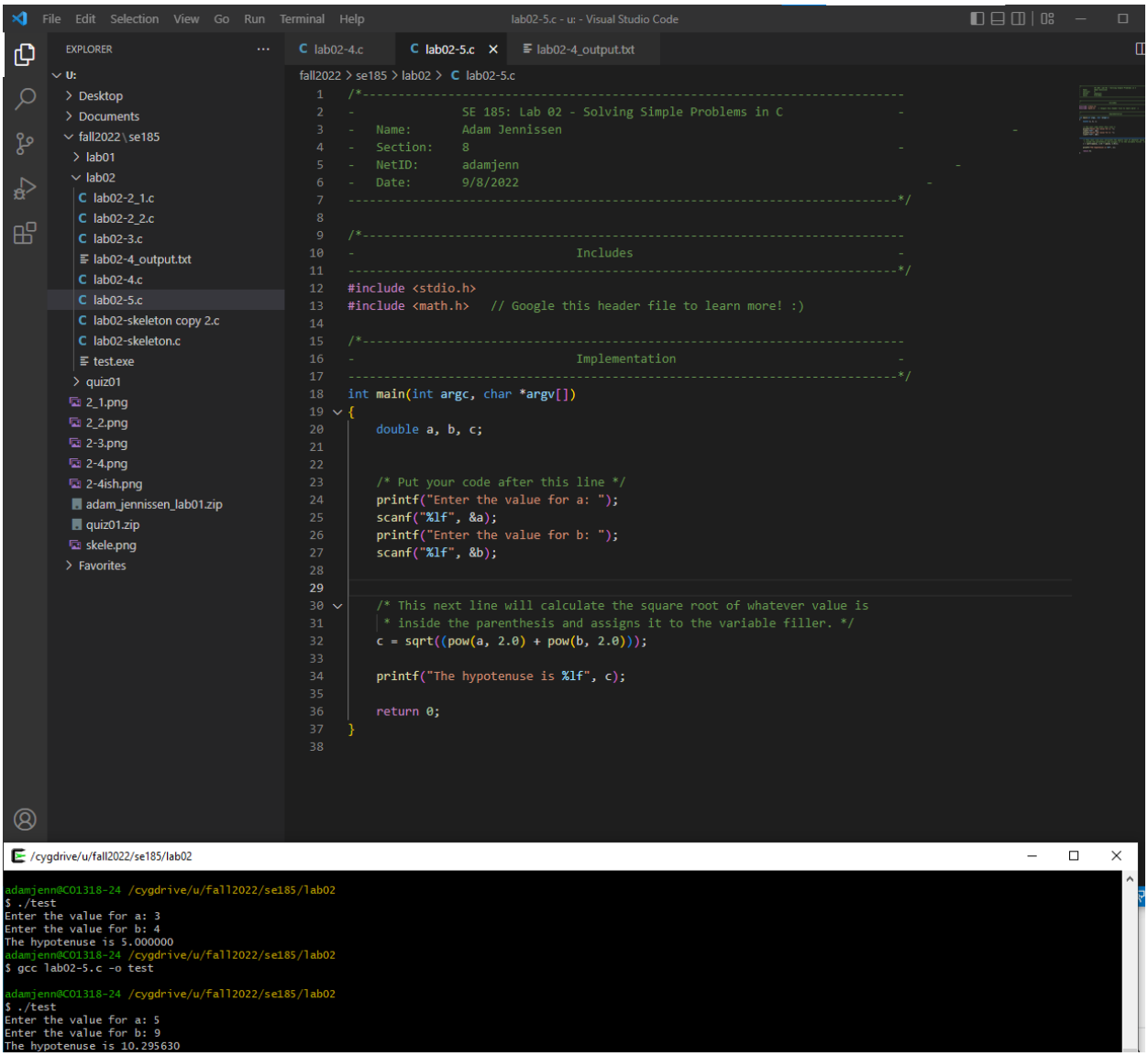
lab02-3.c
fall2022 > se185 > lab02 > lab02-4.c
- Section: 8 -
- NetID: adamjenn -
- Date: 9/8/2022 -
*/
/*
- Includes -
*/
#include <stdio.h>
#include <math.h>
/*
- Implementation -
*/
int main(int argc, char *argv[])
{
int a = 6427 + 1725;
int b = (6971 * 3925) - 95;
double c = 79 + 12 / 5;
double d = 3640.0 / 107.9;
int e = (22 / 3) * 3;
int f = 22 / (3 * 3) ;
double g = 22 / (3 * 3);
double h = 22 / 3* 3;
double i = (22.0 / 3) * 3.0;
int j = 22.0 / (3 * 3.0);
double k = 22.0 / 3.0 * 3.0;
double l = M_PI * pow((23.576 / M_PI / 2), 2.0); //convert form circumfrence to radius, then find area
double m = 14.0 * 0.3048; //multiply by the amount of feet in one meter
double n = (76.0 - 32.0) / 1.8;
printf("%d\n%d\n%lf\n%lf\n%d\n%d\n%d\n%lf\n%lf\n%lf\n%d\n%lf\n%lf\n", a, b, c, d, e, f, g, h, i, j, k, l);
return 0;
}
/cygdrive/u/fall2022/se185/lab02
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
8152
27361080
81.000000
33.734940
21
2
2.000000
21.000000
22.000000
2
22.000000
44.231369

7.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fall2022 > se185 > lab02 > lab02-5.c
/*----------
- SE 185: Lab 02 - Solving Simple Problems in C -
- Name: Adam Jennissen -
- Section: 8 -
- NetID: adamjenn -
- Date: 9/8/2022 -
----------*/
/*----------
- Includes -
----------*/
#include <stdio.h>
#include <math.h> // Google this header file to learn more! :)
/*----------
- Implementation -
----------*/
int main(int argc, char *argv[])
{
double a, b, c;
/* Put your code after this line */
printf("Enter the value for a: ");
scanf("%lf", &a);
printf("Enter the value for b: ");
scanf("%lf", &b);
/* This next line will calculate the square root of whatever value is
* inside the parenthesis and assigns it to the variable filler. */
c = sqrt((pow(a, 2.0) + pow(b, 2.0)));
printf("The hypotenuse is %lf", c);
return 0;
}
/cygdrive/u/fall2022/se185/lab02
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
Enter the value for a: 3
Enter the value for b: 4
The hypotenuse is 5.000000
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ gcc lab02-5.c -o test
adamjenn@CO1318-24 /cygdrive/u/fall2022/se185/lab02
$ ./test
Enter the value for a: 5
Enter the value for b: 9
The hypotenuse is 10.295630