

# **Lab 3 Lab Report**

## **LAB 3 SECTION V**

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**SUBMISSION DATE:**

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## Problem

For this lab we were given the task of looking at flawed mathematical functions and asked correct their output and the functions themselves to Achieve the intended value. Furthermore we were asked to design a function to give the area of a circle from its circumference, convert from fahrenheit to celsius and to create a magnitude function from data given by an Esplora.

## Analysis

To look at the flawed code the common problems were integer division and flaws in order of operation. Both of these are simple mistakes that need to be remembered as to not make in the future. The given data with the code 3-3 tells us magnitude from being given an x, y, and z coordinate puts them in a function that defines magnitude as the square root of the sum of the square for each coordinate. I believe this code could be improved by showing the user how it gives its magnitude and by following change within the code rather than over multiple iterations.

## Design

The design of this code was fairly simple both of us used our knowledge of geometry to convert circumference to radius and then plugged that into the formula ( $\text{Area} = \pi * \text{Radius}^2$ ). Our feet to meters conversion was based on the given conversion rate and put into a formula that multiplies the number of feet by the conversion factor given. The celsius conversion was based on the function given which we recreated in the code as shown in the screenshot of 3-2.

## Testing

The tests we did for part 2 had us take the first few math problems and test to see if our code would compile and then we used the same skeleton for all of our remaining math problems. To test our created functions we tried a few values on paper to make sure the logic was valid and used the same output as we had before with the number of decimals modded to give the proper precision.

## Comments

I think it need mention of the infinite magnitude we got trying to run the esplora code without esplora.exe if only for our personal reference. Beyond the small issues there the rest of this lab was rather successful without many other issues.

## Source Code

```
// CprE 185: Lab 3
// Problem 1: Mysterious Output
//Zach Johnson
// section V
#include <stdio.h>

int main()
{
    int integerResult;
    double decimalResult;

    integerResult = 77 / 5;
    printf("The value of 77/5 is %lf\n", integerResult);

    integerResult = 2 + 3;
    printf("The value of 2+3 is %d\n");

    decimalResult = 1.0 / 22.0;
    printf("The value 1.0/22.0 is %d\n", decimalResult);

    return 0;
}
3.1 uncorrected
// CprE 185: Lab 3
// Problem 1: Mysterious Output
//Zach Johnson
// section V
#include <stdio.h>

int main()
{
    int integerResult;
    double decimalResult;

    integerResult = 77 / 5;
    printf("The value of 77/5 is %lf\n", integerResult);

    integerResult = 2 + 3;
    printf("The value of 2+3 is %d\n", integerResult);

    decimalResult = 1.0 / 22.0;
    printf("The value 1.0/22.0 is %d\n", decimalResult);

    return 0;
```

```

}

//lab3-2
//Zach Johnson
//section V
#include <stdio.h>

int main(int argc, char* argv[])
{
    int a = 6427 + 1725;
    int b = (6971 * 3925) - 95;
    int e = (22/3) * 3;
    int f = 22/(3 * 3);
    int j = 22.0/(3 * 3.0);

    double c = 79 + 12/5;
    double d = 3640.0/107.9;
    double g = 22/(3 * 3);
    double h = 22/3 * 3;
    double i = (22.0/3.0) * 3.0;
    double k = 22.0/3.0 * 3.0;

    printf("6427 + 1725 = %d\n",a);
    printf("(6971 * 3925)- 95 = %d\n",b);
    printf("(22/3) * 3 = %d\n",e);
    printf("22/(3 * 3) = %d\n",f);
    printf("22.0/(3 * 3.0) = %d\n",j);

    printf("79 + 12/5 = %3.3lf\n",c);
    printf("3640.0/107.9 = %3.3lf\n",d);
    printf("22/(3 * 3) = %3.3lf\n",g);
    printf("22/3 * 3 = %3.3lf\n",h);
    printf("(22.0/3.0) * 3.0 = %3.3lf\n",i);
    printf("22.0/3.0 * 3.0 = %3.3lf\n",k);

    double circ = 23.567;
    double pi = 3.141;
    double radius = ((circ/pi)/2.0);
    double area = pi * (radius * radius);
    printf("Area of a circle with diameter %2.3lf = %3.3lf\n", circ,area);

    double feet = 14;
    double meter = feet * .3048;
    printf("There are %3.2lf meters in %2.0lf feet\n", meter,feet);

    double n = (76 - 32)/1.8;
    printf("76 degrees fahrenheit = %3.2lf degrees celsius\n", n);

```

```

    return 0;
}

// CprE 185: Lab 3
// Problem 3: Esplora

#include <stdio.h>
#include <math.h>

int main() {
    double x, y, z;

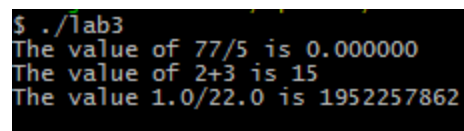
    while (1) {
        scanf("%lf , %lf , %lf", &x, &y, &z);
        printf("Magnitude of (%5.2lf,%5.2lf,%5.2lf) is: %6.2lf\n",
            x, y, z, sqrt(x*x+y*y+z*z) );
    }

    return 0;
}

```

## Screen Shots

Screenshot 3-1 of Lab 3-0

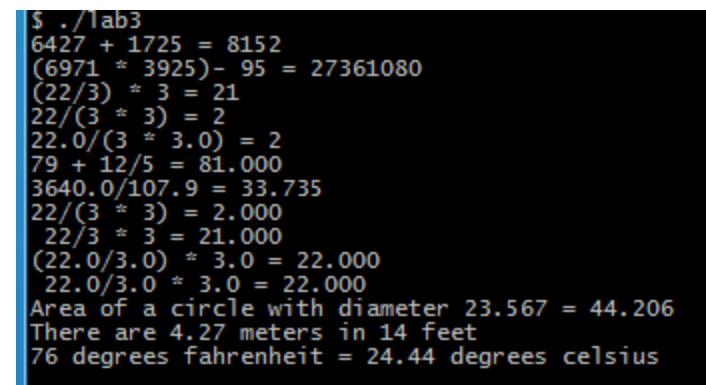


```

$ ./lab3
The value of 77/5 is 0.000000
The value of 2+3 is 15
The value 1.0/22.0 is 1952257862

```

Screenshot 3-2 of lab 3-1



```

$ ./lab3
6427 + 1725 = 8152
(6971 * 3925) - 95 = 27361080
(22/3) * 3 = 21
22/(3 * 3) = 2
22.0/(3 * 3.0) = 2
79 + 12/5 = 81.400000
3640.0/107.9 = 33.735
22/(3 * 3) = 2.444444
22/3 * 3 = 21.000000
(22.0/3.0) * 3.0 = 22.000000
22.0/3.0 * 3.0 = 22.000000
Area of a circle with diameter 23.567 = 44.206
There are 4.27 meters in 14 feet
76 degrees fahrenheit = 24.44 degrees celsius

```