

# COSC 120 Lab 6.2 Report

## Charles Reigle

### Lab 6.5

#### Source Code

```
// Charles Reigle

const double PI = 3.14;
const double RATE = 0.25;

void findArea(float, float&);
void findCircumference(float, float&);

int main()
{
    cout << fixed << showpoint << setprecision(2);
    float radius = 12;

    cout << " Main function outer block" << endl;
    cout << " PI, RATE, radius, iomanip, iostream, findArea, and findCircumference are active here" << endl << endl;

    {
        float area;

        cout << "Main function first inner block" << endl;
        cout << "PI, RATE, radius, iomanip, iostream, findArea, and findCircumference, area are active here" << endl << endl;

        findArea(radius, area);

        cout << "The radius = " << radius << endl;
        cout << "The area = " << area << endl << endl;
    }

    {
        float radius = 10;
        float circumference;

        cout << "Main function second inner block" << endl;
        cout << "PI, RATE, radius, iomanip, iostream, findArea, and findCircumference, circumference are active here" << endl << endl;

        findCircumference(radius, circumference);

        cout << "The radius = " << radius << endl;
        cout << "The circumference = " << circumference << endl << endl;
    }

    cout << "Main function after all the calls" << endl;
    cout << "PI, RATE, radius, iomanip, iostream, findArea, and findCircumference are active here" << endl << endl;

    return 0;
}

// ...

void findArea(float rad, float& answer)
{
    cout << "AREA FUNCTION" << endl << endl;
    cout << "PI, RATE, iomanip, iostream, findArea, and findCircumference, rad, and area are active here" << endl << endl;

    answer = PI * pow(rad, 2);
}

// ...

void findCircumference(float length, float& distance)
{
    cout << "CIRCUMFERENCE FUNCTION" << endl << endl;
    cout << "PI, RATE, iomanip, iostream, findArea, and findCircumference, length, and circumference are active here" << endl << endl;

    distance = 2 * PI * length;
}
```

#### Output

```

Main function outer block
PI, RATE, radius, iomanip, iostream, findArea, and findCircumference are active here

Main function first inner block
PI, RATE, radius, iomanip, iostream, findArea, and findCircumference, area are active here

AREA FUNCTION
PI, RATE, iomanip, iostream, findArea, and findCircumference, rad, and area are active here

The radius = 12.00
The area = 452.16

Main function second inner block
PI, RATE, radius, iomanip, iostream, findArea, and findCircumference, circumference are active here

CIRCUMFERENCE FUNCTION
PI, RATE, iomanip, iostream, findArea, and findCircumference, length, and circumference are active here

The radius = 10.00
The circumference = 62.80

Main function after all the calls
PI, RATE, radius, iomanip, iostream, findArea, and findCircumference are active here

```

## Answers

### Exercise 1:

GLOBAL	Main	Main (inner 1)	Main (inner 2)	findArea	Circumference
PI = 3.14	PI = 3.14	PI = 3.14	PI = 3.14	PI = 3.14	PI = 3.14
RATE = 0.25	RATE = 0.25	RATE = 0.25	RATE = 0.25	RATE = 0.25	RATE = 0.25
findArea	findArea	findArea	findArea	findArea	findArea
findCircumference	findCircumference	findCircumference	findCircumference	findCircumference	findCircumference
iostream	iostream	iostream	iostream	iostream	iostream
iomanip	iomanip	iomanip	iomanip	iomanip	iomanip
	radius	radius	radius	rad	length
		area	circumference	area	circumference

Exercise 2: A radius of 12 will be passed for the area, and a radius of 10 will be passed for the circumference

## Lab 6.6

### Source Code

```
7 void normalizeMoney(float& dollars, int cents = 150);
8 // This function takes cents as an integer and converts it to dollars
9 // and cents. The default value for cents is 150 which is converted
10 // to 1.50 and stored in dollars
11
12 int main()
13 {
14     int cents;
15     float dollars;
16
17     cout << setprecision(2) << fixed << showpoint;
18
19     cents = 95;
20     cout << "\n We will now add 95 cents to our dollar total\n";
21
22     normalizeMoney(dollars, cents);
23
24     cout << "Converting cents to dollars resulted in " << dollars << " dollars\n";
25
26     cout << "\n We will now add 193 cents to our dollar total\n";
27
28     cents = 193;
29     normalizeMoney(dollars, cents);
30
31     cout << "Converting cents to dollars resulted in " << dollars << " dollars\n";
32
33     cout << "\n We will now add the default value to our dollar total\n";
34
35     normalizeMoney(dollars);
36
37     cout << "Converting cents to dollars resulted in " << dollars << " dollars\n";
38
39     return 0;
40 }
41
42 // ...
43
44 void normalizeMoney(float& dollars, int cents)
45 {
46     float total = 0;
47
48     static float sum = 0.0;
49
50     dollars = cents / 100.0;
51
52     total = total + dollars;
53     sum = sum + dollars;
54
55     cout << "We have added another $" << dollars << " to our total" << endl;
56     cout << "Our total so far is $" << sum << endl;
57
58     cout << "The value of our local variable total is $" << total << endl;
59 }
```

### Output

We will now add 95 cents to our dollar total  
We have added another \$0.95 to our total  
Our total so far is \$0.95  
The value of our local variable total is \$0.95  
Converting cents to dollars resulted in 0.95 dollars

We will now add 193 cents to our dollar total  
We have added another \$1.93 to our total  
Our total so far is \$2.88  
The value of our local variable total is \$1.93  
Converting cents to dollars resulted in 1.93 dollars

We will now add the default value to our dollar total  
We have added another \$1.50 to our total  
Our total so far is \$4.38  
The value of our local variable total is \$1.50  
Converting cents to dollars resulted in 1.50 dollars

Answers

## Lab 6.7

### Source Code

```
// Prototypes of the functions
void convertMulti(float dollars, float& euros, float& pesos);
void convertMulti(float dollars, float& euros, float& pesos, float& yen);
float convertToYen(float dollars);
float convertToEuros(float dollars);
float convertToPesos(float dollars);

int main()
{
    float dollars;
    float euros;
    float pesos;
    float yen;

    cout << fixed << showpoint << setprecision(2);

    cout << "Please input the amount of American Dollars you want converted "
        << endl;
    cout << "to euros and pesos" << endl;
    cin >> dollars;

    convertMulti(dollars, euros, pesos);

    cout << "$" << dollars << " = " << euros << " Euros and " << pesos << " Pesos." << endl << endl;;

    cout << "Please input the amount of American Dollars you want converted\n";
    cout << "to euros, pesos and yen" << endl;
    cin >> dollars;

    convertMulti(dollars, euros, pesos, yen);

    cout << "$" << dollars << " = " << euros << " Euros " << pesos << " Pesos and " << yen << " Yen." << endl << endl;

    cout << "Please input the amount of American Dollars you want converted\n";
    cout << "to yen" << endl;
    cin >> dollars;

    yen = convertToYen(dollars);

    cout << "$" << dollars << " = " << yen << " Yen." << endl << endl;

    cout << "Please input the amount of American Dollars you want converted\n";
    cout << "to euros" << endl;
    cin >> dollars;

    euros = convertToEuros(dollars);

    cout << "$" << dollars << " = " << euros << " Euros." << endl << endl;

    cout << "Please input the amount of American Dollars you want converted\n";
    cout << "to pesos" << endl;
    cin >> dollars;

    pesos = convertToPesos(dollars);

    cout << "$" << dollars << " = " << pesos << " Pesos." << endl << endl;

    return 0;
}
```

### Output

Please input the amount of American Dollars you want converted  
to euros and pesos

10

\$10.00 = 10.60 Euros and 97.30 Pesos.

Please input the amount of American Dollars you want converted  
to euros, pesos and yen

10

\$10.00 = 10.60 Euros 97.30 Pesos and 1243.50 Yen.

Please input the amount of American Dollars you want converted  
to yen

10

\$10.00 = 1243.50 Yen.

Please input the amount of American Dollars you want converted  
to euros

10

\$10.00 = 10.60 Euros.

Please input the amount of American Dollars you want converted  
to pesos

10

\$10.00 = 97.30 Pesos.