

# Lab Activity #4 - Functions

## Exercise #1:

Write a function `addThem`. `addThem` takes two integer parameters and returns the sum of the two integers. In your `main` program, prompt the user for two integers, call the function `addThem` with these two integers as the parameters, and print out the result.

## Exercise #2:

The following formula gives the distance between two points  $(x_1, y_1)$  and  $(x_2, y_2)$ .

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

If one of the points corresponds to the center point of a circle, and the other point corresponds to a point on the circle, we can figure out the radius of the circle using the above formula.

Here is the main program:

```
#include<iostream>
#include<cmath>
using namespace std;

//the function prototype goes here

int main()
{
    double x1,y1,x2,y2;
    double r;

    cout<<"Enter 4 numbers corresponding to the";
    cout<<"coordinates of two points";

    cin>>x1>>y1>>x2>>y2;

    r = radius(x1,y1,x2,y2);

    cout<<"The radius is: "<<r;

    return 0;
}
```

```
//the code of the function goes here
```

Type in the code that is listed above. Create the function prototype and function code for `radius` and place them in the appropriate spots. The function accepts 4 `double` numbers and return 1 `double` number. The function should use the `sqrt` and `pow` predefined functions.

Write another function called `circumference` that takes the radius of the circle and returns the circle's circumference. The formula for a circumference is:  $2\pi r$

Write another function called `area` that takes the radius of the circle and returns the area of the circle. The formula for the area of the circle is:  $\pi r^2$

### **Exercise #3:**

Create a coin-flipping game. **Ask the user** how many times to flip the coin, and use the `random` function to determine heads or tails each time a coin is flipped.

Assume the user starts with \$50. Every time the coin is flipped calculate the total (heads +\$10, tails -\$10). Create another function to test if the user has gone broke yet (THIS FUNCTION MUST RETURN A BOOLEAN TRUE/FALSE VALUE). End the program when the user is broke or when the coin was flipped the number of times the user had specified.

Display:

- 1) how many times the coin was flipped,
- 2) the number of times "heads" was the result,
- 3) the number of times "tails" was the result, and
- 4) how much money the user has at the end

**Exercise #4: The Psychic Lab (courtesy of Prof. Imberman)**

One stormy night, as Dionne worked diligently on her CSC 126 labs, a bolt of lightning struck the house. The power surge raced through her computer, causing it to emit a strange glow. A strange new program appeared on her computer called "psychic". Dionne told all her friends that this program was capable of predicting the future. If they wanted to use the program, they could download it from her web site.

To try the computer psychic network free, go to [www.cs.csi.cuny.edu/~zelikovi/csc126/psychic2.exe](http://www.cs.csi.cuny.edu/~zelikovi/csc126/psychic2.exe) . (Example of how your program should work)

Your objective: To write a program that will predict the future. Use the main function to do the following...

1. Prompt the user for his/her lucky number. This number will be largely ignored by the rest of the program (it's only for show, for the user's sake).
2. Prompt the user for which life topic he/she wants a prediction. Based on the user's response call one of three functions. Suggestions are love, finance, and school, but you may use three of your own choosing. Use a nested if-else statement to control which function is called.

Each function will...

1. Call the `rand` function
2. Use the value generated by the `rand` function and modulus operator as the selector expression in a switch statement.
3. Create a SWITCH that will print out the predictions.
4. Allow for five different predictions per function.

Finally, prompt the user to see if they want another prediction. Keep executing the program until the user tells you to quit. Make sure that you code for all possible user inputs, including wrong ones.