

CS-141 Basic Method Problems

1. **Terminology:** It is very important to learn the terminology that is used in reference to methods, i.e. know what is meant when someone says:
 - a. call a method
 - b. return a value
 - c. pass a value as a parameter
 - d. Write (or implement) a method e.g. called **doSomething** that has two **String** parameters and **returns** a **double**.

The exercises below will help you learn how the terminology is used.

2. *Rolling a Pair of Dice* - Write a method called **roll** that:
 - a. Rolls a 6 sided die (i.e. randomly generate an integer in the range 1 to 6).
 - b. Prints the result.

(Note, this method has no parameters and no return value.)

Call the method twice from the main method to simulate rolling a pair of dice.

3. Modify the above **roll** method so that it:
 - a. Rolls a 6 sided die, as before.
 - b. No longer prints the result but instead returns the integer value of the roll.

(Note, this method has no parameters and an integer return value)

In the main method:

- a. Call the method twice, saving the return value in variables.
- b. Print the value of each roll.
- c. Print the value of the sum of the two rolls.

4. Modify the above roll method so that one can choose the number of sides of the die. That is, the roll method should now have one integer parameter called **nSides**. The method should
 - a. Roll a die with **nSides** sides (i.e. randomly generate an integer in the range 1 to **nSides**).
 - b. Return the integer value of the roll.

(Note, this method has one integer parameter and an integer return value)

In the main method:

- a. Call the method twice with difference values for the number of sides.
- b. Print the value and number of sides for each roll.
- c. Print the value of the sum of the two rolls and the maximum possible value of the two rolls.

5. Write a method called **checkWin** that has 2 parameters: the player's name (String) and the player's score (int). Suppose the value of the name that is passed to the method is "Bob". Then, if the value of the score that is passed to the method is 20 or above, the method returns "Bob, you win. Congratulations!", otherwise it returns "Sorry Bob, you lose". Call this method from main to test it. (Note, this method has two parameters (an int and a String), and it has a String return value.)

6. Scope: In R5.9 (p. 211, or see code below)

- a. For each declared variable, give its name and the line number where it is declared. For example, there is a variable called `i` declared on Line 5. Note, some variable names (e.g. `i`) are declared more than once and actually represent different variables. This is allowed (and is unambiguous) because they are in different code blocks. Be sure to list all occurrences of these variable declarations.
- b. For each of the variables listed in part a, identify its scope, i.e. the range of line numbers where this variable is accessible. For example, the scope of variable `i` declared on Line 5, is lines 5-8.
- c. Determine the output of the program *before* running the code to see if you understand how values are passed and returned. Run the code to check your answer.

```
1 public class Sample
2 {
3     public static void main(String[] args)
4     {
5         int i = 10;
6         int b = g(i);
7         System.out.println(b + i);
8     }
9
10    public static int f(int i)
11    {
12        int n = 0;
13        while (n * n <= i) { n++; }
14        return n - 1;
15    }
16
17    public static int g(int a)
18    {
19        int b = 0;
20        for (int n = 0; n < a; n++)
21        {
22            int i = f(n);
23            b = b + i;
24        }
25        return b;
26    }
27 }
```