# **Lab 5\_1 Assignment**

## Part 1:

1. Create a Java project called **Lab5\_1A** and a class named **Lab5\_1A**.
2. Create a second new class named **DivRobot**.
3. Copy the following code inside your **DivRobot** class.

// ToDo - declare 2 int instance variables named number & sum

// ToDo - declare a String instance variable named rating

// Constructor 1

**public** DivRobot (**int** inNum)

{

// ToDo - set the value of number to the parameter & set sum to 0

}

// Constructor 2

**public** DivRobot()

{

// ToDo - set number & sum equal to 0

}

// Give number a value

**public** **void** setNumber (**int** inNum)

{

// ToDo - set the value of number to the parameter

}

// Find all of nunber's divisors and add them up. Put the total into sum

**public** **void** addDivisors()

{

// ToDo - write a loop that looks at all values from 1 up to number-1

// and add up all the ones that divide evenly into number

// use sum to hold the running total

}

// Determine the number's rating (Perfect, Deficient or Abundant)

**public** **void** setRating()

{

// ToDo - call the addDivisors method. (Remember, you don't have to put an object name in front of it,

// just type the name of the method and () after it

// ToDo - set rating to "Perfect" if number is equal to the sum of its divisors (sum)

// ToDo - set rating to "Deficient" if number is greater than the sum of its divisors (sum)

// ToDo - set rating to "Abundant" if number is less than the sum of its divisors (sum)

}

**public** String toString()

{

// ToDo - return a String value that contains the 3 instance variables, each with a label.

// Look at the Tutorial3 program from Lab3 if you need a reminder of how to do this.

}

1. Look for the lines with //ToDo and follow the instructions, filling in the required code. (Ignore the other comments; those are just documentation.)
2. Now go back to the **Lab5A** class and copy the following inside the main method.

// ToDo - declare and instantiate a DivRobot object named robbie; send 6 as the parameter

// ToDo - declare and instantiate a DivRobot object named ben; do not send any parameters

// ToDo - declare and instantiate a DivRobot object named alice; send 8 as the parameter

// ToDo - call setNumber for ben sending 12 as the parameter

// ToDo - call setRating for robbie, ben and alice

// ToDo - print the info for robbie, ben & alice using the toString method (Print the robot’s name first, and print a blank line between each robot’s info)

1. Follow the instructions in the //ToDo to complete the code there too.
2. Debug and test your code.

## Part 2:

1. Create a Java project called **Lab5\_1B** and a class named **Lab5\_1B**.
2. Create a second new class named **CoinFlipper**
   1. Add 2 int instance variables named **headsCount** and **tailsCount**
   2. Add a constructor with no parameters that sets both instance variables to 0;
   3. Add a public int method named **flipCoin** (no parameters). It should generate a random number between 0 & 1 and return that number. (Important note: put the **Random randomNumbers = new Random();** statement before all the methods, just under the instance variables.)
   4. Add a public void method named **countFlips** (no parameters) that will use a loop to call **flipCoin** 100 times and look at its result. It should count how many times the flip is heads (1) and how many times it’s tails (0) and put those values into the instance variables, **headsCount** and **tailsCount**
   5. Write a public String method named **toString** that will return a string containing the instance variables along with a label for each one.
3. Back in the Lab5B class:
   1. Declare and instantiate a **CoinFlipper** object named **flippy** (no parameters).
   2. Call **countFlips** for **flippy**
   3. Use the toString method to print **flippy**’s data.
   4. Debug and test your program. Run it several times to see how the number of heads and tails compare.