

# CST8110 - Introduction to Programming

## Assignment #3 - Loops

**DUE: Friday April 6<sup>th</sup> at 11:59pm SHARP - see submission instructions below. Late submissions receive a grade of 0.**

### Problem Description:

Using the steps for Problem Solving - generate for the following problem:

- a) Test plan AND
  - b) Write and test the program code in Java.
- This problem will simulate a dice betting game. You are welcome to customize the game to your own rules - just be sure to document them. **However, you must meet the basic requirements which follow.**
  - The user will start with a pot of money of \$100.
  - In each play of the game,
    - The player will enter a valid bet amount (less than or equal to the current pot, not negative, a bet of **0 means quit the game**).
    - the player will enter a bet type (case insensitive "odd", "even", "high" (9 or above), or "low")
    - The game will then remove their bet amount from the pot
    - The game will then roll three die (simulate this using the Random class in Java, [see page 3 below](#)) display the values and add these values to a total.
    - Then add double the bet amount if they selected the correct type
  - **The game will end with a bet of 0 OR when the pot reaches 0.**
  - Design of this solution will involve three classes:
    - [Assign3](#)
    - [Game](#)
    - [Die](#)

**Marks will be removed for (see marking guide):**

- Use of `System.exit()`
- Use of recursion

**Bonus opportunity: Use an array of Die instead of three variables**

**Sample Output #1:** (*blue indicates user entered information*)

```
Welcome to Double or Nothing Dice Game..bet an amount and type
    -if you are correct, you win twice your bet,
    -otherwise you lose your bet
A bet of 0 ends the game
```

```
Your current pot is 100
Enter your bet amount: 10
Enter your bet type: high
Your dies are: 2 and 6 and 3
You WIN....double your bet
```

```
Your current pot is 110
Enter your bet amount: 10
Enter your bet type: high
Your dies are: 3 and 2 and 4
You WIN....double your bet
```

Your current pot is 120  
Enter your bet amount: 10  
Enter your bet type: odd  
Your dies are: 4 and 1 and 6  
You WIN....double your bet

Your current pot is 130  
Enter your bet amount: 130  
Enter your bet type: even  
Your dies are: 3 and 3 and 3  
You LOSE....your bet

Your current pot is 0  
You end the game with pot of 0

### **Sample Output #2:**

Welcome to Double or Nothing Dice Game..bet an amount and type  
-if you are correct, you win twice your bet,  
-otherwise you lose your bet  
A bet of 0 ends the game

Your current pot is 100  
Enter your bet amount: 10  
Enter your bet type: LOW  
Your dies are: 5 and 2 and 6  
You LOSE....your bet

Your current pot is 90  
Enter your bet amount: 10  
Enter your bet type: Hi  
Please enter odd, even, high, or low ....Enter your bet type: idk  
Please enter odd, even, high, or low ....Enter your bet type: oDd  
Your dies are: 6 and 1 and 1  
You LOSE....your bet

Your current pot is 80  
Enter your bet amount: 100  
Error - cannot bet less than 0 or more than 80...Enter your bet amount: -25  
Error - cannot bet less than 0 or more than 80...Enter your bet amount: 50  
Enter your bet type: even  
Your dies are: 6 and 5 and 2  
You LOSE....your bet

Your current pot is 30  
Enter your bet amount: 0  
You end the game with pot of 30

### **Submission Requirements:**

- You must create a .zip file that contains ONLY the following:
  - Your program code - .java files - (with your name, section, lab teacher listed in comments in the header of each class)
  - A document created with either Notepad, Wordpad or Word named Assign3.docx or Assign3.txt with your test plan - note this should contain your name, section and lab teacher listed at the top.
- The .zip file must have the following as it's name
  - Your last name, your first name, the word assign and the assign number ...

Example    RosenblumHowardAssign3.zip

- Submit the .zip file through the Assignment feature which has been enabled in the CST8110 Blackboard course. This should be directly under the Assignment description.
- Marks will be given for correct submission (ie marks will be deducted for incorrect submission!

### **Notes on Using the Random class in Java**

- See also pages 209-215 of Java, How to Program Textbook
- The Random class is found in library **java.util**.
  - o ie ... we need to **import java.util.Random** into a java program to be able to use it
- You need to declare an object of the class first:
  - o ie ... declare once in your program, at the beginning:  
**Random randomNumbers = new Random ();**
- Then, you can call a method called **nextInt** on your object of Random class with an integer parameter which will return a random number between 0 and the integer parameter - 1. In other words, the nextInt method returns a random number % the parameter you sent to it.
  - o In our case, we want to generate a random number between 1 and 6, so we can execute nextInt(6)...which returns a random number between 0 and 5 and then add 1 to get a number between 1 and 6.
  - o ie ... any time you want to generate a random number and store it into a variable that you have already declared (in this example, dieValue), execute :  
**dieValue = randomNumbers.nextInt (6) + 1;**