

Assignment #2 – Craps

Date assigned: Thursday, February 11, 2010
Date due: Thursday, February 18, 2010
Points: 25

For this assignment, you are to implement an abstract die class (class Die in Die.java), and a six-side die class (class DieSixSided in DieSixSided.java), and a ten-sided die class (class DieTenSided in DieTenSided.java) as Java classes. The six and ten-sided die classes inherit from the die class. Each of the classes is to be implemented in a single project called PUNetIDJava (where PUNetID is your 8 character PUNetID) using Eclipse3.5. Further each of the classes is to exist in a package called edu.pacificu.cs.GamePieces. The class definition of class Die is as follows:

```
import java.util.Random;

public abstract class Die
{
    protected int sideValue;
    private final int DEFAULT_SEED = 1234;
    protected int randomSeed = DEFAULT_SEED;
    protected Random randomNumberGenerator;

    public Die ()
    {
        randomNumberGenerator = new Random (randomSeed);
    }

    public Die (int randomSeed)
    {
        randomNumberGenerator = new Random (randomSeed);
    }

    public abstract void set (int sideValue) ;

    public int get ()
    {
        return sideValue;
    }

    public abstract void roll ();

    public void display ()
    {
        System.out.print (sideValue);
    }
}
```

Using inheritance, you are to implement the classes DieSixSided and DieTenSided. Each class is to have two constructors, one passing in a randomSeed value and one without any parameters which uses the default random seed value. Each class is to have the ability to set, get, roll, and display appropriately.

Next, you are to use the same exact Dice class from assignment 1 except there is to be exactly one constructor that accepts two Die objects, so delete the default constructor and the constructor that accepts a randomSeed. Keep all other logic exactly the same.

Finally, using the classes above, you are to implement the game of craps in a class called Craps. The Craps class is to be located in a package called edu.pacificu.cs.Games in the project PUNetIDJava.

Craps is played with a pair of six-sided die. The shooter rolls the pair of dice. If the shooter rolls a 7 or 11, the shooter wins. If the shooter rolls a 2, 3, or 12, the shooter loses. If the shooter rolls a 4, 5, 6, 8, 9, or 10 then that value becomes their point value. The shooter must roll their point value BEFORE rolling a 7 to win the game. As an example, let's say the shooter initially rolls a 9. If the second roll is a 10 and the third roll is a 7, the shooter loses. If the third roll happened to be a 9, then the shooter wins. You can bet an integer amount of

money between \$1 and the amount of money the player has on credit. The player either wins or loses the amount of money bet. That is, if the player has \$100 and bets \$10 and wins, the player has \$100. If the player loses, they have \$90. Error check to make sure the player is betting a legal amount of money. Also, error check that the user enters a R or C.

Your program is to work as follows:

```
*****
*           Welcome to Craps           *
*****

Enter Credit Amount: $100

Enter [R)oll C)ash Out]: R
Enter Bet Amount: $101
Enter Bet Amount: $10

Shooter rolls: 8
Shooter rolls: 10
Shooter rolls: 7

You lose: $10
Account Balance: $90

Enter [R)oll C)ash Out]: X
Enter [R)oll C)ash Out]: C

Thank-you for playing.
```

You are to create a JUnit test for class DieSixSided and class DieTenSided as follows:

1) **public final void** testDieSixSided () {}

This method is to create a single DieSixSided object using the predefined randomSeed and roll the Die 100,000 times. Use an array with six elements to collect the number of times a 1, 2, 3, 4, 5, and 6 were rolled. Output your results exactly as follows:

```
*****
* testMultipleDieSixSidedRolls Execution *
*****

Side 1 occurred xxxxx times
Side 2 occurred xxxxx times
Side 3 occurred xxxxx times
Side 4 occurred xxxxx times
Side 5 occurred xxxxx times
Side 6 occurred xxxxx times
```

2) **public final void** testDieTenSided () {}

This method is to create a single DieTenSided object using the predefined randomSeed and roll the Die 100,000 times. Use an array with ten elements to collect the number of times a 1, 2, 3, ..., 10 were rolled. Output your results exactly as follows:

```
*****
* testMultipleDieTenSidedRolls Execution *
*****

Side 1 occurred xxxxx times
Side 2 occurred xxxxx times
Side 3 occurred xxxxx times
Side 4 occurred xxxxx times
Side 5 occurred xxxxx times
Side 6 occurred xxxxx times
```

Side 7 occurred xxxxx times
Side 8 occurred xxxxx times
Side 9 occurred xxxxx times
Side 10 occurred xxxxx times

3) Also write an appropriate JUnit test for class Craps. A well designed and implemented Craps class will have a small main and well defined methods that perform a single task. Don't give me one large main with all of the logic in the main.

Goals for Assignment #2:

1. Write more complicated Java classes using inheritance
 2. Continue to debug and test our classes using the JUnit framework
 3. Continue to use SVN for revision control
 4. Review and use the basic concepts of OOP
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Specifics:

1. Save your program in a project folder called PUNetIDJava. Then drop the entire folder into the CS360AndroidDrop folder by 1pm on the day in which the assignment is due.
2. Your code is to be written using the development tools specified in the syllabus.
3. If you come to me with a question regarding your solution, I will have you load your project onto a machine in the CS lab. I will not look at your code on your computer or on paper as it just takes me too long to get at the problem. Further, I want you to bring in your textbook and lecture notes in case I want you to look up something. Remember, I'm not just a tell you the answer guy.
4. If you want help with a compiler error, you must be able to tell me exactly what statement you put in your code that caused the error and be able to isolate the error. If you have typed in a bunch of code and have not tested your code as you've gone along, I'm not going to help you sort out the mess. You've been warned!!
5. Print out your classes in a logical order such as the Die class followed by the DieSixSided class which uses the Die class and so on. Also, your output is to be double-side in color with a single staple in the upper-left corner.
6. Create the Javadocs for all of the public information in your PUNetIDJava folder as we discussed in class. The folder is to be at the same level as the src and bin folders.