

Homework 2-1 - Classes and Objects

Name: _____

This homework is to be submitted to the Bright Space webpage for completion checking.

Part A:

- 1) Examine the **Die** Class in this week's page.
 - a) Which method is the constructor?
 - b) How can it be identified as a constructor?
 - c) Explain the function of the other methods.
- 2) The following link takes you to the documentation of the Java 2 Platform, Standard Edition version 6. <https://docs.oracle.com/javase/6/docs/api/> Though we are now at Java 15, the older API docs are easier to search.
 - a) Find the **Math** class. In which package is the **Math** class?
 - b) How many methods does the **Math** class have?
 - c) Find the **NumberFormat** class. In which package is the **NumberFormat** class?
 - d) Find the **System** class. In which package is the **System** class?
 - e) Find the **Double** class. In which package is the **Double** class?

Part B:

3) Verifying random number generation of the Die class

The values generated by the rollDie() method of the Die class should, in theory, have the same probability. One way to test this is calculate the average of the rolls. The average of the rolls should be or be very close to 3.5 if the random generator is working correctly. Change the self testing main method so that it rolls one die 7200 times and calculates their average value. Test your class and write 5 results (to 5 decimal places) below.

4) Create a class named Dice that USES the Die class. Copy the Die class into a folder in your directory and create the Dice class in a new file in the same directory. Code this new class as follows:

```
//Class data:
    private Die d1
    private Die d2
    private int value

//Constructor:
    Public Dice()
        //creates two die objects

public void rollDice()
    //Rolls the two dice objects

public int getValue()
    //Gets the value of each die object - use the methods in the Die class (e.g.
        //d1.getValue(), etc.)
    // adds them together
    //returns the total

public static void main (String args [ ])
    // creates a Dice object
    // rolls the dice
    //displays the total
    // asks the user if wants to roll again (exits if user answers "no")
```

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