CPE 102
Homework #1

Due: March 22, 2023.
START EARLY!

Assigned on March 10. You should submit your program through Teams by Wednesday, March 22 (any time up to midnight). Before submitting, place all your files in a directory called "YourFullName-HW1", zip/compress your directory, and upload a **single** zipped file. Remember that your code should be fully documented. I once again remind you to read the academic honesty policy stated in the syllabus. If you submit code without **comments** or without proper **indentation**, you will lose 10% of your grade.

Part 1.

(a) First write a Java class called **Die** (as in the singular of Dice) that represents one die (zar) with faces showing values between 1 and 6. It should contain :

--one integer instance variable, **faceValue,** that represents the current face value of the die, an integer constant (**MAX)** that represents the maximum face value of the die.

--a constructor

--and five methods: **roll, setFaceValue, getFaceValue, toString** and **equals**.

The **roll** method should compute a random integer between 1 and 6 and set the current face value with that as a way of simulating the rolling of the die. (What Java class and method would you use to get a random integer ?? find out..)

(b) Write a driver called **RollingDice**, in order to test your Die class.

Part 2. Using the Die class, implement a class called **PairOfDice**, composed of **two Die objects**. In other words this class will contain two instance variables (call them **die1** and **die2**) of type Die. Include methods to **set** and **get** the individual die values (name them **getDie1, setDie1, getDie2, setDie2**), **toString** and **equals** methods, a method to roll the dice (call it **roll**), and a method that returns the current sum of the two die values (call it **getDiceSum**).

Part3. Properly using your **PairOfDice class,** write a Java program (a driver with a main function), called **DiceGame.java,** that allows the user to play the a game with the computer. Here are the rules of the game: A player rolls the dice repeatedly until she rolls at least one 1 or voluntarily gives up the dice. (When the player enters 'n' when asked whether to continue, that means user gives up her turn—see the example run below.) Each time she rolls the dice the total on the faces of the dice is added to her score, except when she rolls a 1. If she rolls one 1, she loses all the points she's accumulated so far **in her turn**. If she rolls two 1's, she loses all of her points **so far in the game**. (This means you have to keep track of the points in each turn and also the points since the beginning of the game). The first player to get a total of 100 wins. The

computer follows the same rules, except that it turns over the dice as soon as its score for the current turn is at least 20.

Here's an excerpt from a working program.

```
 Welcome to the DiceGame.  It's you against the computer.
You play by rolling the dice.  The first player
to get 100 points wins.  However, if you roll one 1
you lose all the points you've accumulated in your
turn.  If you roll two 1's, you lose all your
points.  You can turn the dice over at any time.
However, if you roll one or two 1's, you lose your
turn.  I (the computer) play by the same rules,
except I'll always turn over the dice when I've
rolled 20 or more points in a single turn.
Ready to begin? (Type 'y' when you're ready)
y

You're rolling the dice . . .
You rolled 2 4
This gives you a turn total of
    6
and a grand total of
    6
The computer has a total of
    0
Do you want to continue rolling?  (Type 'y' or 'n')
y

You're rolling the dice . . .
You rolled 3 3
This gives you a turn total of
    12
and a grand total of
    12
The computer has a total of
    0
Do you want to continue rolling?  (Type 'y' or 'n')
y

You're rolling the dice . . .
You rolled 1 3
You got a 1!
Continue? (Type 'y' when you're ready to
turn the dice over to me)
y
The score is
    You:       0
    Computer:  0

I'm rolling the dice . . .
I rolled 1 4
I got a 1!
Continue? (Type 'y' when you're ready)
y
The score is
```

```
    You:       0
    Computer:  0

You're rolling the dice . . .
You rolled 5 5
This gives you a turn total of
    10
and a grand total of
    10
The computer has a total of
    0
Do you want to continue rolling?  (Type 'y' or 'n')
n

I'm rolling the dice . . .
I rolled 1 1
I got two 1's!
Continue? (Type 'y' when you're ready)
y
The score is
    You:       10
    Computer:  0

[Many turns deleted . . .]

You're rolling the dice . . .
You rolled 1 6
You got a 1!
Continue? (Type 'y' when you're ready to
turn the dice over to me)
y
The score is
    You:       0
    Computer:  93

I'm rolling the dice . . .
I rolled 5 4
This gives me a turn total of
    9
and a grand total of
    102
The score is
    You:       0
    Computer:  102

Better luck next time!
```

Your program should contain the same information and it should run in the same way. You can assume that the user will make no mistakes when she types in her input.

Files to be submitted (as a single zipped directory): Die.java, RollingDice.java, PairOfDice.java, DiceGame.java