Dungeons & Dragons: Random Numbers

Dungeons & Dragons is a pen-and-paper, tabletop, role playing game which consists of you and your friends' imagination(s) and a lot of random numbers. The random numbers, which ultimately decide your adventurer's fate, are generated by dice. Dungeons & Dragons uses several polyhedral dice which allows a Dungeon Master (game narrator) to create different probabilities of success for actions your character may take. For this lab you will create an application that simulates a roll for each die type used in Dungeons & Dragons.

Create a single integer variable called **diceRoll** that will store the result of each roll, which should be implemented by creating a method with the signature **int rollDice(int lower, int upper)**. You will use the **Math.random()** method as the basis for algorithm to generate a random number between a lower and upper bound. Your method should return an integer that is **>= lower and <=upper**. The dice you will simulate rolling are as follows.

- d4 – Four-sided die that generates number 1 through 4
- d6 – Six-sided die generates number 1 through 6
- d8 – Eight-sided die that generates a number 1 through 8
- d10 – Ten-sided die that generates a number 1 through 10
- d12 - Twelve-sided die that generates a number 1 through 12
- d20 – Twenty-sided die that generates a number 1 through 20
- d100 – One hundred-sided die that generates a number 1 through 100

In main, for each dice type, invoke the method **rollDice**, store the returned result in **diceRoll**, and print **diceRoll** to the console with an appropriate label as shown below.

Remember Math.random() returns a fractional value that is greater than or equal to zero but less than 1 **(0 <= valueReturned < 1.0)**. You will need to do some math to get it to return the number you need. Also, you will need to cast the result of your mathematical operations to an integer before you store the calculated value in the **diceRoll** variable, as Math.random() returns a decimal value.

Run your program several times to ensure it is generating the correct range of values.

Example Output

```
D&D Dice Roller
d4 roll = 1
d6 roll = 3
d8 roll = 4
d10 roll = 8
d12 roll = 5
d20 roll = 15
d100 roll = 66
```

```
D&D Dice Roller
d4 roll = 2
d6 roll = 1
d8 roll = 5
d10 roll = 9
d12 roll = 6
d20 roll = 18
d100 roll = 16
```

```
D&D Dice Roller
d4 roll = 4
d6 roll = 2
d8 roll = 5
d10 roll = 2
d12 roll = 2
d20 roll = 20
d100 roll = 58
```

Deliverables

Make sure your code has the required file header and correctly formatted identifier names, as outlined in the CS Java Documentation Policy under Course Info on D2L.

To receive credit for this lab you must

1. Demonstrate the code and execution to the instructor during this lab, during office hours, or during the next lab period.
2. Zip the src folder in your project directory and upload the instructor approved .java files to the Lab 9 D2L drop box.