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Computer Science 1-INT 2210

Lab Assignment #3

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**Solution to Lab Assignment #3.**

I have named this program *Die.* The fundamental goal of this program is to play a die game between a user and the computer. At the end of the 10 rounds of die play, the grand winner will be announced. More specifically, my program creates a Die class that contains 2 variables, a constructor, and methods to roll Die objects that will be created and called in the later part of the main method.

For my program to effectively play the die game, I had to come up with a very logical reasoning to make it work. Within my class, I declared 2 variables that would represent the user’s die and the computer’s die respectively. In my constructor, I initialized values to these variables and I also called the roll die method to make my constructor very constructive in regard to its subsequent calling by objects of the class. In the actual roll dice method, I called the random variable twice, attributing its value to my already created user and die constructors (the intention here was to give the user and computer die chances of rolling the die simultaneously without having the same values all the time). After creating the get user value and get computer value methods, I went into coding the logic of the program in the main method.

In the main method, I created and initialized all the variables that would be necessary for the proper running of the program. I kept track of the winners, the number of iterations, and succeeded in keeping a track of all the lab question requirements. I hope that anyone who reads my program enjoys programming and the logic behind line of code.

**Input Data:** The input data for this program was auto-generated by calling the roll die class for the objects used in the main method.

**Processing Data:** The processing is done automatically by calling all the required methods and instances.

**Output Data:** The program has a lot of output data. It constantly interacts with the user to ask him to hit a button to roll the die and to give results about the number of wins and iterations.

***Die* Program (written in java):**

**package** Lab3;

/\*\*

\* This program was written by Edward Tatchim on 10/23/2018 .

\*

\*/

**import** java.util.Random; //importing the java Random class

**import** javax.swing.JOptionPane; //this line calls the JOptionPane library to be used in the bankPaymentProgram

**public** **class** Die {

**public** **static** **int** userDiceValue; //variable to store the user's dice value

**public** **static** **int** computerDiceValue; //variable to store the computer's dice value

**public** **Die**() //constructor that initializes the dice values to 0 and calls the roll dice method

{

userDiceValue=0;

computerDiceValue=0;

rollDice();

}

**public** **void** **rollDice**() //roll dice method that is called to randomly roll the dice using the random class that was pre-written by java.

{

Random **rand** = **new** Random(); // I created an instance of the random class that was pre-written by java.

userDiceValue = rand.nextInt(6) + 1; //I set the random value generator's boundaries from 1-6 since we are dealing with a 6-sided dice

computerDiceValue = rand.nextInt(6) + 1; //I set the random value generator's boundaries from 1-6 since we are dealing with a 6-sided dice

}

**public** **int** **getUserValue**() //this method returns the value of the user dice every time that it is called

{

**return** userDiceValue;

}

**public** **int** **getComputerValue**() //this method returns the value of the computer dice every time that it is called

{

**return** computerDiceValue;

}

**public** **static** **void** **main**(String[] args) { //introducing the main method portion of the class

**int** **totalNumberOfRolls**=11; //I initialized the total number of rolls to 11 because the lower sentinel boundary was initialized to 1

**int** **computerNumberOfWins** = 0; // I initialized this variable to 0 such that it can take account for all the times the computer wins.

**int** **userNumberOfWins**=0; // I initialized this variable to 0 such that it can take account for all the times the user wins.

**int** **noWinnerNumberOfTimes**=0; //I initialized this variable to 0 such that it can take account for all the times neither the computer or user wins.

Die **userDie**=**new** Die(); // I created an object for the user's die to represent the Die class

Die **computerDie**=**new** Die(); // I created an object for the computer's die to represent the Die class

**boolean** **userWin**=**false**; //I created this boolean variable to check that the user wins before executing any subsequent lines of code

**boolean** **computerwin**=**false**; //I created this boolean variable to check that the computer wins before executing any subsequent lines of code

System.**out**.println("The initial value of these dice are:");

System.**out**.println(" ");

System.**out**.println("User die value : " + userDie.getUserValue()); //prints the initial value for the user's dice

System.**out**.println("Computer die value : " + computerDie.getComputerValue()); //prints the initial value for the computer's dice

System.**out**.println(" ");

JOptionPane.showMessageDialog(**null**, "Hit the OK button to roll the user's dice 10 times");

JOptionPane.showMessageDialog(**null**, "The COMPUTER wil also roll the dice 10 times");

System.**out**.println("I will roll the dice " + (totalNumberOfRolls-1) + " times. "); // tells the user how many times the dice will be rolled

System.**out**.println(" ");

**for**(**int** **sentinel**=1;sentinel<totalNumberOfRolls;sentinel++) // this is the for loop that does all the 10 iterations of the dice rolls

{

userDie.rollDice(); // calls the roll dice method to roll the user's dice

computerDie.rollDice();// calls the roll dice method to roll the computer's dice

System.**out**.println("Time number: " + sentinel); // keeps track of the number of iterations currently being processed

System.**out**.println("The current values of the dice are :");

System.**out**.println("User die value : " + userDie.getUserValue()); // prints the user's rolled number to the screen

System.**out**.println("Computer die value : " + computerDie.getComputerValue()); // prints the computer's rolled number to the screen

**if**(userDie.getUserValue()>computerDie.getComputerValue()) // determines who wins a specific rolling round

{

userWin=!**false**; // checks the winning condition

System.**out**.println("The user wins the " + sentinel + " round");

System.**out**.println(" ");

userNumberOfWins++; //// keeps count of the number of wins

}

**else** **if**(computerDie.getComputerValue()>userDie.getUserValue())

{

computerwin=!**false**; // checks the winning condition

System.**out**.println("The computer wins the " + sentinel + " round");

System.**out**.println(" ");

computerNumberOfWins++; // keeps count of the number of wins

}

**else**

{

noWinnerNumberOfTimes++;

System.**out**.println(" ");

System.**out**.println("It is a tie: DRAW GAME." ); // keeps count of the number of draws

System.**out**.println(" ");

}

}

System.**out**.println("The USER wins " + userNumberOfWins + " times while the COMPUTER wins " + computerNumberOfWins + " times."); // gives us a summary of the wins between the USER and the COMPUTER

System.**out**.println("The USER and COMPUTER had a draw : "+ noWinnerNumberOfTimes + " times"); // gives us a summary of the draws between the USER and the COMPUTER

System.**out**.println("Therefore:");

System.**out**.println(" ");

**if**(computerNumberOfWins>userNumberOfWins) // conditional statements to determine who is the GRAND WINNER

{

System.**out**.println(" ");

System.**out**.println("The COMPUTER's die is the grand winner!!!! YAY!");

}

**else** **if** (userNumberOfWins>computerNumberOfWins)

{

System.**out**.println(" ");

System.**out**.println("The USER's die is the grand winnner!!! YAY!");

}

**else** **if**(userNumberOfWins==computerNumberOfWins)

{

System.**out**.println(" ");

System.**out**.println("Unfortunately, there is NO WINNING die today, The contestants are in a tie!");

}

**else**

{

System.exit(0);// exits if none of the above mentioned conditions are met.

}

}

}

// We have gracefully come to the end of all computations, hence the end of the DIE program. WHoHooo!!!