CISC 110 Lab 5: Die-Rolling Simulation

Lab 5 Marking Scheme (1% of final mark)

1 mark - A button starts the trials
1 mark - Reads the number of trials and the particular die value from input text fields
1 mark - One trial: a while loop rolls the die until the user's specified roll value is rolled.
1 mark - Completes the specified number of trials via a nested while loop
1 mark - Calculates and displays the average number of rolls that were required to obtain the specified roll value

An important kind of application in computing is simulations, for instance simulations of air traffic patterns at an airport, simulations of the stock market and simulations of climate change.

In this lab, you will complete the first portion of Assignment 5. In your assignment, you will create an app that simulates throwing a six-sided die (only one die, rather than a pair of dice) many times in order to do a statistical analysis of how random the Math.random method actually is.

In the lab portion, you will read the number of trials to complete and a particular die value (1, 2, 3, 4, 5 or 6) from input text fields. Then you will run that number of trials with that die value. One trial will consist of rolling the die until that die value is rolled. You will calculate the average number of rolls it took to roll the user's die value over all of the trials. Since there are six numbers on the die, if there is an even probability of rolling any one of them, it should take an average of six rolls to roll a desired value.

No animation is required for the lab portion.

Here is what you need to do for the lab portion:

1. Create a button that will start the trials when the user presses it: when the button is pressed, it will read the number of trials, read the die value and start the trials.
2. Read the number of trials from an input text field.
3. Read a particular die value (1, 2, 3, 4, 5, or 6) from an input text field.
4. For a single trial, write a while loop that uses Math.random to simulate rolling the die until the user's specified die value is rolled. Count how many rolls it took to roll the specified die value.
5. Write a while loop that completes the specified number of trials (a while loop that contains the while loop from step 4). After completing all of the trials, calculate the average number of rolls it took to roll the user's die value over all of the trials (i.e., the sum of the number of rolls it took in each trial divided by the number of trials).

6. Display the result in an output text field.