Homework 6

CSC-121, Fall 2025

Submission Instructions: Create a single text file for your answers (Use .txt or .pdf) with your name and ID number at the top. Include code written for any programs, and type-written answers to non-coding questions. Submit the file on Canvas to complete the assignment. You may work in groups or use genAI help, but written answers must be in your own words.

Q1. It's as Easy as 1-2-3, A-B-C

The following questions involve writing loops, and file input/output.

Letter Counter

Write a program that asks the user to enter a string, and then asks the user to enter a character. The program should count and display the number of times that the specified character appears in the string.

File Letter Counter

Write a program that asks the user to enter the name of a file, and then asks the user to enter a character. The program should count and display the number of times that the specified character appears in the file. Use Notepad, TextEdit, or another text editor to create a simple file that can be used to test the program.

NumberList 1

Write code that does the following: opens a file named NumberList.txt, uses a loop to write the numbers 1 through 100 to the file, and then closes the file.

NumberList 2

Write code that does the following: opens the NumberList.txt file that was created by the code in the question "NumberList 1", reads all of the numbers from the file and displays them, and then closes the file.

NumberList 3

Modify the code you wrote in the question "NumberList 2" so it adds all of the numbers read from the file and displays their total.

Q2. Dice game

Write a program that plays a simple dice game between the computer and the user. When the program runs, a loop should repeat 5 times. Each iteration of the loop should do the following:

- Generate a random integer in the range of 1 through 6. This is the value of the computer's die.
  HINT: Use the Random class. (See next page)

- Ask the user to type the word "roll" to start their turn. If the user types anything other than the word "roll", ask the user to try again until they type "roll".
  HINT: Use a while loop for input validation. (See next page)

- Generate another random integer in the range of 1 through 6. This is the value of the user's die.

- The die with the highest value wins. (In case of a tie, there is no winner for that particular roll of the dice.)

As the loop iterates, the program should keep count of the number of times the computer wins, and the number of times that the user wins. After the loop performs all of its iterations, the program should display who was the grand winner, the computer, the user, or a tie.

Random Class

```
1)  import java.util.Random;
.......
.......
2)  Random randomNumbers = new Random();

// assume we need random numbers between 1 and 6 (
// including 1 and 6)
int number;
3)  number = randomNumbers.nextInt(6)+1;
```
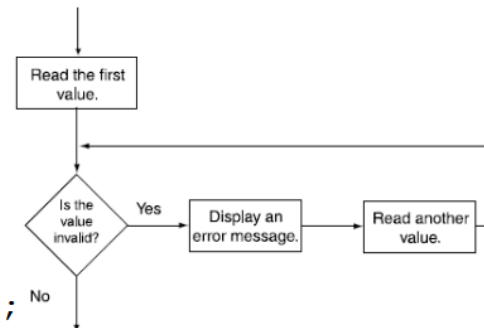
> This generates a random number
> from 0 to 5

```
- How about
number = randomNumbers.nextInt(100) - 50 ;
```

The while Loop for Input Validation

Input validation is the process of
<u>ensuring that user input is valid.</u>

Read the first value.
Is the value invalid?
Yes → Display an error message. → Read another value.
No

```
...
Scanner keyboard = Scanner(System.in);
System.out.print("Enter a number between 1 and 100: ");
number = keyboard.nextInt();

// Validate the input.
while (number < 1 || number > 100)
{
   System.out.println("That number is invalid.");
   System.out.print("Enter a number between 1 and 100: ");
   number = keyboard.nextInt();
}
...
```