CSC 2720: Data Structures
Lab 1

Instructor: Shiraj Pokharel

Due : Next Day of the Lab @ 11:00 PM ET

Answer the below questions. I would recommend that you use a general editor/IDE for programming, something freely available to use without any legal penalties.
You will then upload your java files together in a ZipFile on iCollege
ZipFile Naming Convention : FirstnameLastname-Lab1
Responses will be graded on correctness, code design, and code style.
Note that your program's output must **exactly** match the specs given here for each problem to pass the instructor's test cases.

Design refers to how well your code is written (i.e. is it clear, efficient, and elegant). *Style* refers to the readability of your code (commented, correct indentation, good variable names).

(1) (20 points) Write a Java class called `PersonalizedHelloWorld` that prompts a user for their name and then displays "Hello, [name here]!" The flow should look like the following:

```
What is your name? Firstname Lastname
Hello, Firstname Lastname!
```

If the user does not enter anything but presses Enter anyways, you should re-prompt for the user's name. This flow should look like the following (note that there should be a space after any ? or :):

```
What is your name?
Please enter your name:
Please enter your name: Firstname Lastname
Hello, Firstname Lastname!
```

(2) (80 points) Write a Java class called `GuessMyNumber` that prompts the user for an integer n, tells the user to think of a number between 0 and $n-1$, then makes guesses as to what the number is. After each guess, the program must ask the user if the number is lower, higher, or correct. You must implement the divide-and-conquer algorithm from class. In particular, you should round up when the middle of your range is in between two integers. (For example, if your range is 0 to 31, you should guess 16 and

not 15, but if your range is 0 to 30 you should certainly guess 15). The flow should look like the following:

```
Enter n: 32
Welcome to Guess My Number!
Please think of a number between 0 and 31.
Is your number: 16?
Please enter C for correct, H for too high, or L for too low.
Enter your response (H/L/C): H
Is your number: 8?
Please enter C for correct, H for too high, or L for too low.
Enter your response (H/L/C): L
Is your number: 12?
Please enter C for correct, H for too high, or L for too low.
Enter your response (H/L/C): C
Thank you for playing Guess My Number!
```

As part of your implementation, you should check that n is not 0 or negative. (You need not worry about the case where the user enters a non-integer). You should also check that the user is entering one of the letters H, L, or C each time your program makes a guess. This flow should look like the following:

```
Enter n: -1
Enter a positive integer for n: 32
Welcome to Guess My Number!
Please think of a number between 0 and 31.
Is your number: 16?
Please enter C for correct, H for too high, or L for too low.
Enter your response (H/L/C): asdf
Enter your response (H/L/C): H
Is your number: 8?
...
```

You can assume that the user will always give honest answers.