CMPS 12A – Fall 2017
Programming Assignment 2
Due: Friday October 20 @ 11:59pm

Overview
The purpose of this assignment is to write a program that plays a number guessing game with the user. Your program will give an introduction, telling the user to guess a number between 1 and 10. Your program should randomly generate a new number to guess every time the program is run. The user will have 3 guesses to guess the number. After each guess, the user should be told if there number was too high or too low. If the user guesses the number, your program should output "Congratulations your_name, you won in X guesses." Here, your_name is the user's name (your program should prompt the user for their name at the beginning, and store it in a variable). Your source file for this program will be called GuessingGame. java, defining a class GuessingGame. A couple sample runs of the program will look like the following (bold blue is user input…yours won't need to be blue or bolded):

```
Welcome to the number guessing game. What is your name?
Dustin

I'm thinking of an integer between 1 and 10. You have 3 guesses.

Your first guess: 3
Too low, guess higher.

Your second guess: 6
Too high, guess lower.

Your third guess: 5

Game over Dustin, you lose.
```

```
Welcome to the number guessing game. What is your name?
Dustin

I'm thinking of an integer between 1 and 10. You have 3 guesses.

Your first guess: 7
Too high, guess lower.

Your second guess: 4

Congratulations Dustin! You won in 2 guesses.
```

Your program will need to be formatted exactly as the above program. Observe that the output includes blank lines at the beginning and end of the program output, and blank lines separating guesses. Since your program is generating a random number every time its run, then you'll need to use Math.random() to generate a new integer between 1 and 10. Since Math.random() only generates a floating point in the range [0,1), you'll need to perform some arithmetic and casting in order to get an integer between 1 and 10.

What to turn in
Submit a file called GuessingGame.java to the Canvas assignment Programming Assignment 2.

Discussion
There is an optimal strategy the user can adopt to be able to guess the magic number in 3 guesses or less 70% of the time. In fact, if the user were allowed 4 guesses, the user could win the game every time. Try to modify your program on your own to verify the latter claim. Similarly, the user can win the game 100% of the time if the user is guessing between 1 and 7 with only 3 guesses. Try to deduce such a strategy, and show that by using it, the guesser will win 70% of the time. As an exercise, write a program that plays the other side of the game (i.e. the role of guesser) and that implements this optimal strategy. This exercise will yield no credit for the current assignment, but it may be an interesting and rewarding exercise.

Grading Rubric

Program compiles and runs.	2pts
User is prompted for name and random number generated correctly.	2pts
User is allowed maximum of 3 guesses.	2pts
"Win", name, and number of guesses it took output correctly.	2pts
"Lose" displayed correctly after 3 incorrect guesses.	2pts
Total:	10pts