Computer Science 210 –Computer Organization

Homework Exercise 8
Due on Github by 11:59 PM Monday 28 March

Your turn in will consist of a C language source file named **guess.c**. Be sure to place your name in a prefatory comment at the top of this file.

Warmup: Download testrandom.c and run the following commands.

```
$ gcc -o testrandom testrandom.c
$ ./testrandom
```

In the rest of this exercise, you will write a program that allows the user to play the game of guess the number with the computer. In this game, the computer displays a greeting and announces that it's thinking of a number between 1 and 100. It then repeatedly prompts the user for a guess, until the user guesses correctly, or the maximum number of guesses has been reached. When the computer accepts the user's input number, it responds with "Correct!" or the hint "Too small!" or "Too large!". Within the main loop, the computer tracks the total number of guesses made. When the program concludes, the total number of guesses is displayed, as well as the outcome ("You guessed correctly" or "You ran out of guesses").

The max number of guesses needed, given the user is provided a hint each turn, is determined by the equation:

$$\log2 (100)$$

Use this number as the limit for the number of guess that the user is allowed. On the 7th guess, if it is not correct, you should display the "You ran out of guesses" prompt and exit the program.

The program in **testrandom.c** shows how to generate random numbers in C.

EXTRA CREDIT:

As an extra credit assignment, you will reverse the logic of this assignment. Rather than the machine choosing a random number you will now choose the number and the machine will guess. This means that you will have to provide the machine with clues as to whether its guess was higher or lower. The machine should guess intelligently, meaning that they should achieve the answer in log2(100) guesses. The extra credit will be graded more harshly than the assignment. Please only attempt this when you have successfully completed the above assignment. This should be submitted as a separate file from your main assignment.

Please name your assignment file machineguess.c or it will receive no credit.

Sample Run:

My guess is 45, is your number higher or lower?

Clue: Higher

My guess is 72, is your number higher or lower?

Clue: Higher

My guess is 86, is your number higher or lower?

Clue: Lower

My guess is 79, is your number higher or lower?

Clue: Correct

Awesome! Thanks for playing.