CPS 125 – Project 4 Name: _____ Fall 2013

DUE: Sunday, November 10th before 11:59pm

Project 4: Write a number guessing game program that

1. asks for a natural number greater than one that is set to the variable `max`.
2. picks a random integer between 1 and `max` that is set to the variable `answer`.
3. finds and sets the natural number `guesses` that satisfies

$$2^{\texttt{guesses}} \leq \texttt{max} < 2^{\texttt{guesses}+1}.$$

   To be clear, that is 2 to the `guesses` power and 2 raised to the (`guesses`+1) power.

4. asks for a guess of the answer up to `guesses` times.
   (a) If the answer is guessed in `guesses` or less attempts, the program immediately announces that the correct number was picked.
   (b) If the answer is not guessed within `guesses` attempts, the program announces that the maximum number of attempts has been reached and reveals the correct number.

Any time your code asks for input, the program should verify that the input is valid. If the user enters a non-positive integer, the program should repeat the request for an input. Extra credit: If the user enters anything other than an integer, the program should repeat the request for an input.

When you finish your code and being debugging, also consider the question: Is there a winning strategy to this game? I.e., can a wise user always win?

When your project is complete, be sure you have followed the following guidelines:

- Comment your code. There should be a comment at the top with your name and a description of the program as well as comments throughout the code as needed.
- Re-read the above directions to be sure your program follows them.
- Your program should model the output seen below and on the following page exactly.
- Answer the above question, "Is there a winning strategy to this game?" as a comment in your .c file.
- Your code must compile – check it carefully. When finished, name your final version of the source file "<your last name>.c". Send me your .c file as an attachment to an email with subject "CPS 125 - Project 4".

Proj4 model

```
This is <your name>'s number guessing game.

Enter an integer greater than 1: 10
You have 3 guesses to pick a number between 1 and 10.

You have 3 guesses left.  Pick a number between 1 and 10: 5
Your guess is too low.
You have 2 guesses left.  Pick a number between 1 and 10: 8
You win!! Correct answer, 8, found with 1 guesses left.
```

Proj4 model

```
This is <your name>'s number guessing game.

Enter an integer greater than 1: 35
You have 5 guesses to pick a number between 1 and 35.

You have 5 guesses left.  Pick a number between 1 and 35: 1
Your guess is too low.
You have 4 guesses left.  Pick a number between 1 and 35: 35
Your guess is too high.
You have 3 guesses left.  Pick a number between 1 and 35: 2
Your guess is too low.
You have 2 guesses left.  Pick a number between 1 and 35: 34
Your guess is too high.
You have 1 guesses left.  Pick a number between 1 and 35: 3
Sorry, you lose.  The correct answer was 6.
```

Proj4 model

```
This is <your name>'s number guessing game.

Enter an integer greater than 1: -8
Not a valid input.  Try again: asdf
Not a valid input.  Try again: 8.2
Not a valid input.  Try again: 15asdfa
Not a valid input.  Try again: 8
You have 3 guesses to pick a number between 1 and 8.

You have 3 guesses left.  Pick a number between 1 and 8: 9
Not a valid input.  Try again: 12
Not a valid input.  Try again: 0
Not a valid input.  Try again: -5
Not a valid input.  Try again: asdf
Not a valid input.  Try again: 8.2
Not a valid input.  Try again: 15asdfa
Not a valid input.  Try again: asdf548asd
Not a valid input.  Try again: 8
You win!! Correct answer, 8, found with 2 guesses left.
```