

## Code Assignment 3

### Functions & Libraries

## CEC Robotics

### ECE 131 – Programming Fundamentals

Instructor: M. Wolverton

#### Items Due

- `hlgame.h`
- `hlgame.c`
- `main.c`

#### Instructions

Complete the coding directive in your C language IDE of choice (Eclipse, NetBeans) or by command line compiling. Once you have verified that the program works as intended, login to the file server at [cec-code-lab.aps.edu](http://cec-code-lab.aps.edu) and create a folder with the assignment name (e.g. Code 3). Locate all `.c` and `.h` source files written by you (e.g. `hlgame.h`, `hlgame.c`, `main.c`) and upload them to into the assignment folder. Code will be downloaded and archived for grading on the assignment due date.

#### Higher-Lower Guessing Game

Write a program that uses terminal text input and output to create a game where the computer generates a random number and the user tries to guess it. The as the user guesses incorrectly, they should be told whether their guess is too high or too low. If the user passes a certain number of guesses they lose, and if they guess the number in fewer tries, they win.

##### Feature Requirements

- Print program title or welcome message identifying the program and what it is.
- Before each entry, make the user aware of the number of guesses they have remaining and the valid guess range.
- Invalid entries should not consume a turn and the game should allow the user to attempt to guess again.
- Print a message announcing the user has lost if they run out of guesses and **print target value** - the program should end.
- If the user wins, announce that they have won somehow and end the program.
- [optional] Instead of ending the program at a win or loss, ask if they want to play again.
- [optional] Keep score of the player's wins and losses for the session.
- [optional] Create three difficulty settings that expand the guess range and reduce the number of guesses at higher difficulties.

##### Code Structure

- Use **no global variables** anywhere in this project.
- Create a library consisting of a source file (`hlgame.c`) and a header file (`hlgame.h`). Include `hlgame.h` in your main source code file for the project, `main.c`.
- Use each library function defined in your `hlgame` library at least once for its intended purpose.
- Prototype the following functions in `hlgame.h`, with full implementation in `hlgame.c`.

```
int checkGuess(int guess, int target)
```

Description: checkGuess Returns -1 if guess is less than target, 1 if guess is greater than actual, 0 if equal

```
void printEntryPrompt(int min, int max)
```

Description: printEntryPrompt prompts the user to enter a value in the range of min (inclusive) and max (exclusive) with `printf()`.

```
void printNumGuesses(int num)
```

Description: printNumGuesses tells the user how many guesses are remaining with `printf()`.

```
int takeEntry(int min, int max)
```

Description: returns the user's input. Uses `scanf()` and then uses `getchar()` to discard all characters until a line return is found. Valid entries are in the range of min (inclusive) and max (exclusive). If an invalid entry is detected, the function prints an error message and attempts to take entry again.

```
int makeRandNum(int min, int max)
```

Description: makeRandNum Returns a random int value in the range of min (inclusive) and max (exclusive) using `rand`. Also Seeds the random number using `srand` and `time(0)` before generating the value.

### Sample Output

```
|-----|
|Higher - Lower Number Guessing Game|
|          M. Wolverton 2021          |
|-----|
You have 7 guesses remaining.
Enter a number between 1 (inclusive) and 100 (exclusive).
50
Your guess is too high.
You have 6 guesses remaining.
Enter a number between 1 (inclusive) and 100 (exclusive).
25
Your guess is too low.
You have 5 guesses remaining.
Enter a number between 1 (inclusive) and 100 (exclusive).
-197
Invalid entry.
Enter a number between 1 (inclusive) and 100 (exclusive).
...
You have 1 guesses remaining
Your guess is too high.
Enter a number between 1 (inclusive) and 100 (exclusive).
28
|-----|
|          Correct, you got it!          |
|-----|
You have won 1 time and lost 0 times.
Would you like to play again? (y/n)
n
Thanks for playing!
```