

# Northern Michigan University (Marquette Co, MI)

## CS 556-01-24W: Functional Programming

### Program 1

Due: Wednesday 31 January 2024 11:00 A.M. EST

Create a folder called “PG1” in the top level of your CS556-01-24W folder. Place all files pertaining to this assignment into the top level of your PG1 folder. Place a (possibly empty) file called “DONE” into this folder when you are ready to have your programs graded. The only files you need to turn in are the .c and .h files. Please don't turn in any files other than these!!

Mastermind is a game that has been popular for a long time. It inspired Wordle, in particular.

One player chooses a four-digit number between 0000 and 9999. The second player then attempts to guess the number. The second player is told how many digits are correct and in the correct position, and how many digits are correct and in an incorrect position. When the guess is graded, the correct digits in the correct position are tabulated first and then the correct digits in an incorrect position are tabulated.

Suppose the first player chooses 1231.

The second player guesses:

3396: There are no digits in a correct position, and one digit (a 3) in an incorrect position. Notice that only one of the 3's match. No digit is matched twice.

2273: There is one digit in a correct position (the 2) and one digit (the 3) in an incorrect position.

2434: There is one digit in the correct position (the 3) and one digit (the 2) in an incorrect position.

6224: There is 1 digit in the correct position (the first 2). There is no digit in an incorrect position. The second 2 doesn't match anything since the first 2 has already matched the 2 in the answer.

5238: There are 2 digits in the correct position, and no digits in an incorrect position.

1231: All four digits are in the correct position, and the second player has guessed it in six guesses.

Your program should choose a number and allow the user to guess (the computer grading each guess) until the user gets it.

THEN, the program should direct the user to select a four digit number. The program should then guess, allowing the user to grade the guess, until the program gets it right. The program should then print who got it in fewer guesses or if the game was a draw.

Here's the thing. This program should be written in "functional C." No ifs, no loops, no iterative statements, just functions.