CS 288 2019S Section 102
Homework 01

Due: At the beginning of class on Thursday February 7, 2019.

Task: Write a C program to play Mastermind against a human codebreaker.

Mastermind is a simple two-player code-breaking board game. In the game, one player is the codemaker and the other is the codebreaker. The codemaker secretly selects a code consisting of an ordered sequence of four colors ($\mathbf{c}_1$, $\mathbf{c}_2$, $\mathbf{c}_3$, $\mathbf{c}_4$), each chosen from a set of six possible colors, with repetitions allowed. The codebreaker then tries to guess the code by repeatedly proposing a sequence of colors ($\mathbf{g}_1$, $\mathbf{g}_2$, $\mathbf{g}_3$, $\mathbf{g}_4$). After each guess, the codemaker tells the codebreaker two numbers (**b**, **w**): the number of correct colors in the correct positions (**b**) and the number of colors that are part of the code but not in the correct positions (**w**).

For example, consider the six colors: **B**lue, **G**reen, **O**range, **P**urple, **R**ed, and **Y**ellow. If the code is (**B**, **G**, **O**, **O**) and the codebreaker's guess is (**O**, **G**, **P**, **O**), then the codemaker's response would be (**2**, **1**), since the codebreaker has guessed the **G** and the second **O** correctly and in the correct positions, while having guessed the first **O** correctly but in the wrong position.

The codebreaker continues guessing until either the codebreaker guesses the code correctly or until twelve incorrect guesses are made.

Additional Specifications:

- The code to be guessed should be given as a command-line argument
- Use standard input and standard output only
- The input/output must exactly match the samples given, character for character.

Deliverables: A file named *`mastermind.c`* containing the ANSI C source code.

Grading Policy:

- Student found in violation of the University Policy on Academic Integrity will face disciplinary action.
- This is an individual project; collaboration is not permitted. All work that you represent as your own must, in fact, be your own.
- The submission will not receive a grade if the file *`mastermind.c`* produces compilation warnings or errors. So, before submitting your solution, make sure it compiles cleanly using the `gcc` compiler as follows:

```
$ gcc -ansi -Wall -Wextra -Werror mastermind.c
```

Input/Output Sample 1:

```
$ ./a.out PORG
Available Colors: (B)lue (G)reen (O)range (P)urple (R)ed (Y)ellow

No. guesses left: 12
Enter your guess: BBOO
        Feedback: 0, 1

No. guesses left: 11
Enter your guess: BBGG
        Feedback: 1, 0

No. guesses left: 10
Enter your guess: OPPG
        Feedback: 1, 2

No. guesses left: 9
Enter your guess: OPYG
        Feedback: 1, 2

No. guesses left: 8
Enter your guess: PORG
        Feedback: 4, 0
YOU WIN!
```

Input/Output Sample 2:

```
$ ./a.out PORG
Available Colors: (B)lue (G)reen (O)range (P)urple (R)ed (Y)ellow

No. guesses left: 12
Enter your guess: BBBB
        Feedback: 0, 0

No. guesses left: 11
Enter your guess: GGGG
        Feedback: 1, 0

No. guesses left: 10
Enter your guess: OOOO
        Feedback: 1, 0

No. guesses left: 9
Enter your guess: PPPP
        Feedback: 1, 0

No. guesses left: 8
Enter your guess: RRRR
        Feedback: 1, 0

No. guesses left: 7
Enter your guess: YYYY
        Feedback: 0, 0

No. guesses left: 6
Enter your guess: GOPR
        Feedback: 1, 3

No. guesses left: 5
Enter your guess: OGPR
        Feedback: 0, 4

No. guesses left: 4
Enter your guess: PGOR
        Feedback: 1, 3

No. guesses left: 3
Enter your guess: GPOR
        Feedback: 0, 4

No. guesses left: 2
Enter your guess: OPGR
        Feedback: 0, 4

No. guesses left: 1
Enter your guess: POGR
        Feedback: 2, 2
YOU LOSE! The code is PORG
```