**Mastermind Game**

**Project Overview**

For this game, the player is going to play against" the computer, to guess a number combinations. The player has to guess the right number combinations within certain attempts to win the game. The default setting is to guess a 4 number combinations from 0~7, a total of 8 different number within 10 attempts. The player has the choice to change the default setting in the Main Menu.

**Project Flowchart**

A picture containing screenshot

Description automatically generated

**Project Design**

This game has a Main Menu that has six options, which are Start a new game with default setting, Change default setting, Reset game to default, View scores, Exit game, and Back to Main Menu.

1. Start a new game with default setting

The default setting is to guess a 4 number combinations from 0~7, a total of 8 different number within 10 attempts. By choosing this option, the player is going to start the game with default setting.

Once the game starts, the computer will generate a true random 4-digit number. The player has to guess the right number within 10 attempts. If the player gets the right number before attempts run out, computer will show a “Bingo” message telling the player the good news and will display the final score the player hits. Also, the computer will ask the player what to do next, such as, change the default setting to a harder game, exit game, etc. However, if the player doesn’t get the right number until attempts run out, a warning message will be showed telling the player no attempts available and will ask the player what to do next as well.

At the end of each guess, the computer will provide feedback including:

1. The player gets the correct number
2. The player has guessed correct number and its correct location
3. The player guess is incorrect
4. The number of attempts remaining
5. The player has the option to show hint or not. If yes, the hint will be showed after each guess
6. Change default setting

The player has the option to change the default setting.

Here, the player has to input 4 variables:

1. number of the combination digits
2. lower bound number to generate random number
3. upper bound number to generate random number
4. how many attempts.

1. Reset the game to default setting

This option allows the user to reset the game to default setting

1. View scores

The computer has a scoreboard to keep track of the player’s past scores.

1. Exit game
2. Back to the Main Menu

**Learning**

By carefully reviewing the problem statement, I found that a top-down design is suitable and efficient for this project. I came up with all the features of the main menu, it is easy to split the entire project into separate modules, which is much more clear to design and debug, and also provides foundation for modular testing. As a result, the main program looks quite clean and simple. In addition, my debug ability has been improved a lot so as to the ability to design test cases.