

# Mastermind

Your task is to write a program to simulate the game Mastermind, with the computer as the code-setter and the user as the code breaker.

## The rules of Mastermind

The code-setter produces a secret code which is an arrangement of a number of items which are defined before the game begins. The code-breaker, with certain help from the code-setter, attempts to guess the code within a given number of attempts. The game is played by choosing an arrangement of four colours from a given six, and the exact arrangement has to be reproduced by the code-breaker.

When the code-breaker has made a guess at the code, the code-setter must mark the guess. This involves saying how many colours are correct and in the correct position in the arrangement, which is done by giving a number of black markers; and secondly, saying how many colours are correct but in the wrong position, this being indicated by white markers.

For example:

Code set	BLUE	RED	YELLOW	GREEN
Guess	RED	GREEN	YELLOW	BROWN

score 1 BLACK 2 WHITE

The code-breaker then goes on to make another guess, helped this time by the information which has been received from the first guess.

After several guesses and the information received from each one, it should be possible for the code-breaker to deduce the correct arrangement. The final score is linked to the number of guesses made. If the code-breaker is not successful within an agreed number of attempts then the code-setter has defeated the code-breaker.

## Developing a Solution

You should store the instructions for the game in a text file. These instructions should be read and displayed by your program.

You should store the “colours” which can be used in a text file, which should be read by your program. (You can then vary the colours, and possibly the number of colours, without having to change your program).

Develop your solution by breaking the problem down into modules, and where necessary breaking these down into further modules. Write and test a subroutine (def) for each final module.

You must have *at least* the following modules:

Initialise:	This module deals with displaying instructions and the computer's initial choice of secret code.
Input:	This module deals with accepting the player's guess
Process:	This module compares the guess with the secret code
Output:	This module displays the score for the guess

Each of these modules *may be broken down further*.

## Data structure

You should decide how a guess entered by the user is stored

Should this be the same as for the code generated by the computer?