**Mastermind Java**

**Naïve Guess**

For the naïve guess I created a method that calculates all the possible codes and adds it to an ArrayList. The guesses are then taken from the ArrayList starting from the first code.

**Kunth Guess**

The method that I implemented is the five guess algorithm created by Donald Knuth. These are the steps for the algorithm:

1. First create a set S of all the possible codes. I used the same method from naïve guess to calculate this.
2. The first guess is always the first two colours e.g. (red, red, orange, orange) or [0, 0, 1, 1] in my case.
3. Get the response R, if 4 black pegs the you have won the game so you can end the algorithm.
4. Otherwise we remove all the solutions that cannot be the correct code from set S. This is done by going through set S and checking what the response would be if S was the code. If the response is not the same as our current response R then remove the code from set S.
5. Apply minimax to find the next guess. This is done by going through each possible guess (including all guesses not just guesses in set S) and checking the all the possible responses that would be received for each element in set S. Each time a response is removed add one to the score of for the code. The element with the largest score will remove the most elements from set S, therefore the next guess will be the code with the lowest score. If there are multiple codes with the lowest score, then use any that match with an element from set S. Otherwise any of the codes are can be used for the next guess.
6. Go back to step 3.