MASTERMIND PROGRAM

Program 1

The computer holds a 4-digit number, and the user guesses that held number. According to the user's guess, the answer showing that the steps are in the right or wrong place is generated by the computer and shown on the screen.

For example, if the number held is 1926, the operation of the program will be as follows

```
I kept a four-digit number Please try to find it
1st Prediction : 1645
+1 -1
Your 2nd Prediction : 1029
+2 -1
3rd Prediction : 7218
-2
Your 4th Prediction: 1123
Enter a valid Number
Your 4th Prediction : 123
Enter a valid Number
Your 4th Prediction : 12345
Enter a valid Number
Your 4th Prediction : 123
Enter a valid Number
4th Prediction : 2619
-4
5th Prediction: 1926
CONGRATULATIONS!!! YOU WIN ON YOUR 5TH PREDICTION
```

Note: Colored data is entered by the human user. Other data is written by computer.

Program 2

The above program is simple programming.
It can only be taken care of with loop and condition statements.
But in this program, the computer is taught to think.

The human user holds a 4-digit number and the computer tries to find out that it is held. (Adding Intelligence to the Computer)

For example, if the number held by the human user is 1926, the operation of the program will be as follows

```
Please keep a four-digit number and press enter by typing OK
OK
My 1st Prediction: 1645
+1 -1
My 2nd Prediction: 1029
+2 -1
My 3rd Prediction: 7218
-2
My 4th Prediction: 2619
-4
5th Prediction: 1926
+4
I found 5 predictions
```

Note: Colored data is entered by the human user. Other data is written by computer.

Algorithm:

1) Define a boolean array that can hold all valid numbers (1023-9876, keeping numbers)
2) Possible solutions are **True**, others are **False**, for example, the value of element 1154 is **False**. Because there are 2 with a value of 1.
3) Write **a** data with a value of True in the array to the screen (for example, 1645 for the first)
4) Read the answer from the human user

5) If the answer is +4, go to step 8
6) If not, compare all array elements to 1645 based on the value received after estimation 1645 and assign a value of False to all those that do not have a result (+1 -1).
7) Proceed to step 3
8) Conclude the game with the appropriate message.

Optimize the code to be more efficient.