PROJECT : MASTERMIND GAME

INTRODUCTION

The logic game mastermind involves one player creating a hidden sequence out of colored pins and another player making a limited number of guesses about what the sequence is. The player with the hidden sequence gives the guesser feedback on each guess, revealing, through the use of black and white pegs, if the guess featured any pins that exactly matched the color of the hidden sequence and whether the guess had pins that only matched the color of the hidden sequence

OBJECTIVE OF GAME

In this game, there are six color pegs to choose from. The object of the game is to get the exact positions of the colors in the computer sequence in as few guesses as possible. After each guess, the computer gives you a score of exact and partial matches.

RULES OF THE GAME

1) The sequence can contain pegs of colors: red, yellow, green, blue, white, black.

2) A color can be used any number of times in the sequence.

3) All four pegs of the secret sequence will contain a color-no blanks/empties are allowed.

4) Each guess must consist of 4 peg colors-no blanks.

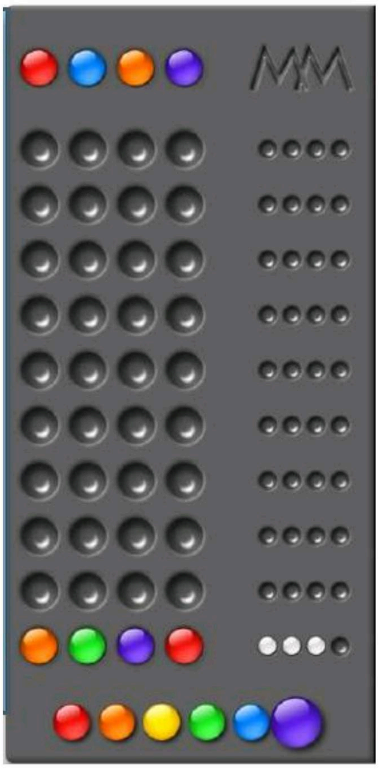
5) The player has twelve guesses to find the secret sequence.

SCORING

For each of the pegs in the guess that is the correct color and the correct position, the computer will give you one small black peg to the right of that move. For each of the pegs in your guess that is a correct color in an incorrect position, the computer will give you one small white peg to the right of that move. Together, there will be no more than four small black and white pegs for each move. If none of the pegs in your guess is of a correct color, you will see no small pegs to the right of that move. If you score four small black pegs on a guess, you have guessed the secret sequence.

CASE: I

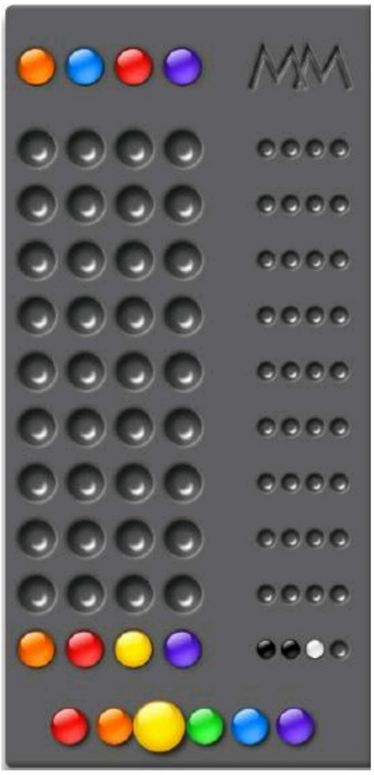
In this case three of the colors (red, orange and purple) in our guess is correct but the position is not correct, as we can see from the correct sequence, hence three white pegs appeared.



CASE: II

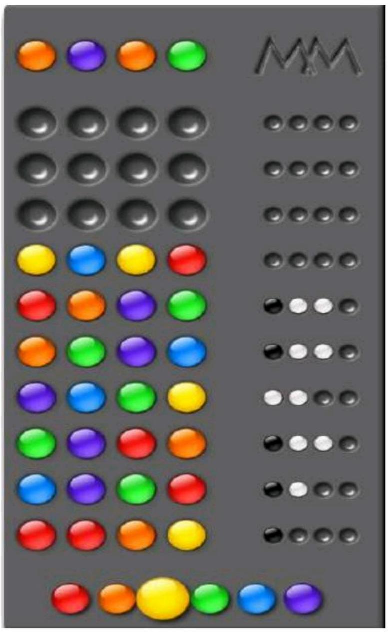
In this case two of the colors (orange and purple) in our guess is correct and their position is also correct, as we can see from the correct sequence, hence two black pegs appeared.

Other than this one more color (red) in our guess is correct but its position is not correct, hence one white peg appeared.



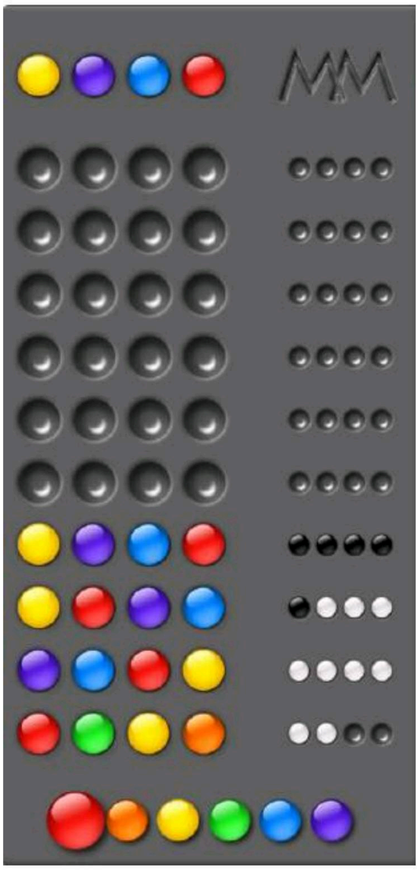
CASE: III

In this case none of the colors (yellow, blue and red) of our guess matches with the actual sequence as we can see and hence no pegs appeared.

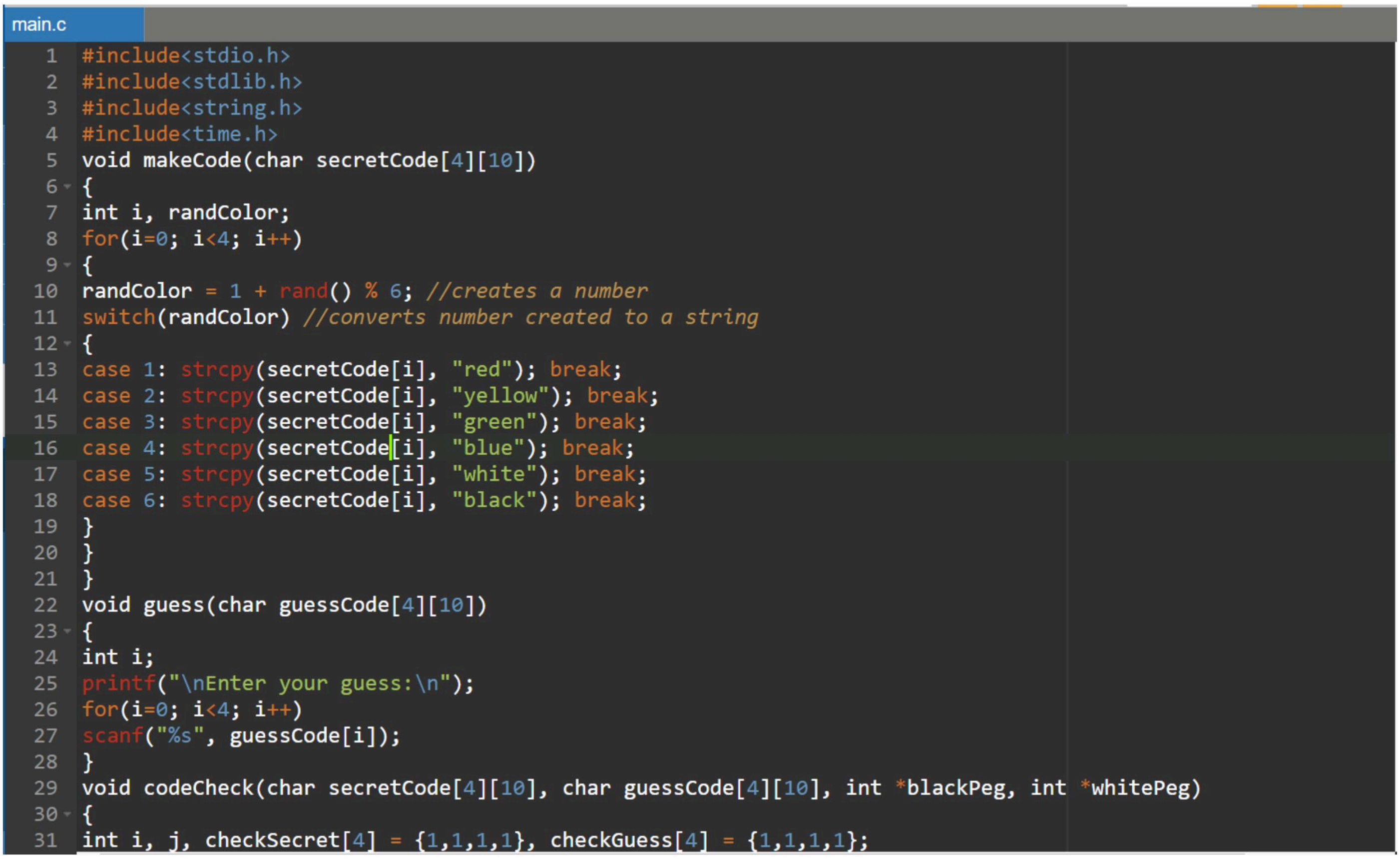


CASE: IV

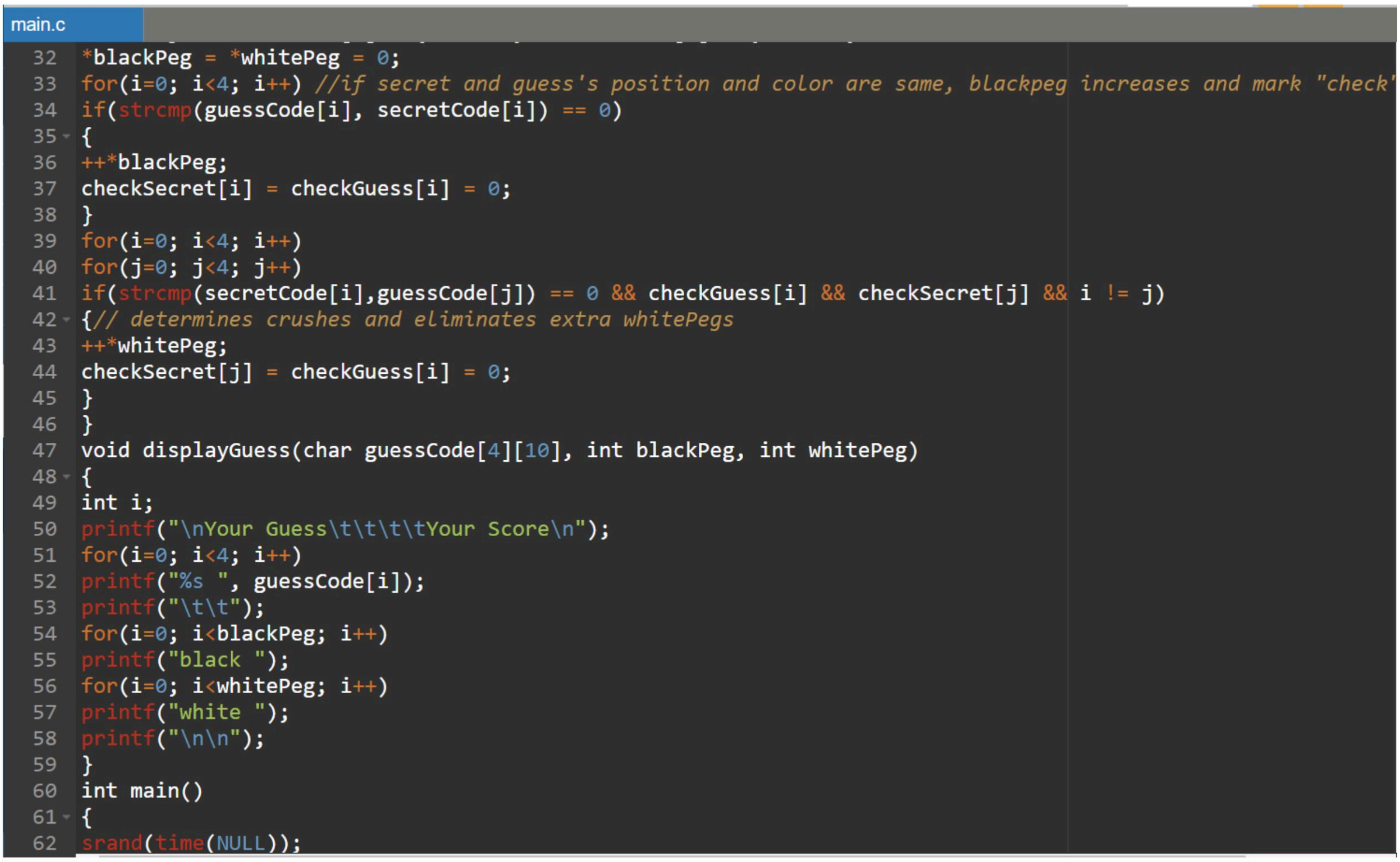
In this case all the colors (yellow, purple, blue, red) are matching with the actual sequence and there position is also correct and hence four black pegs appeared.



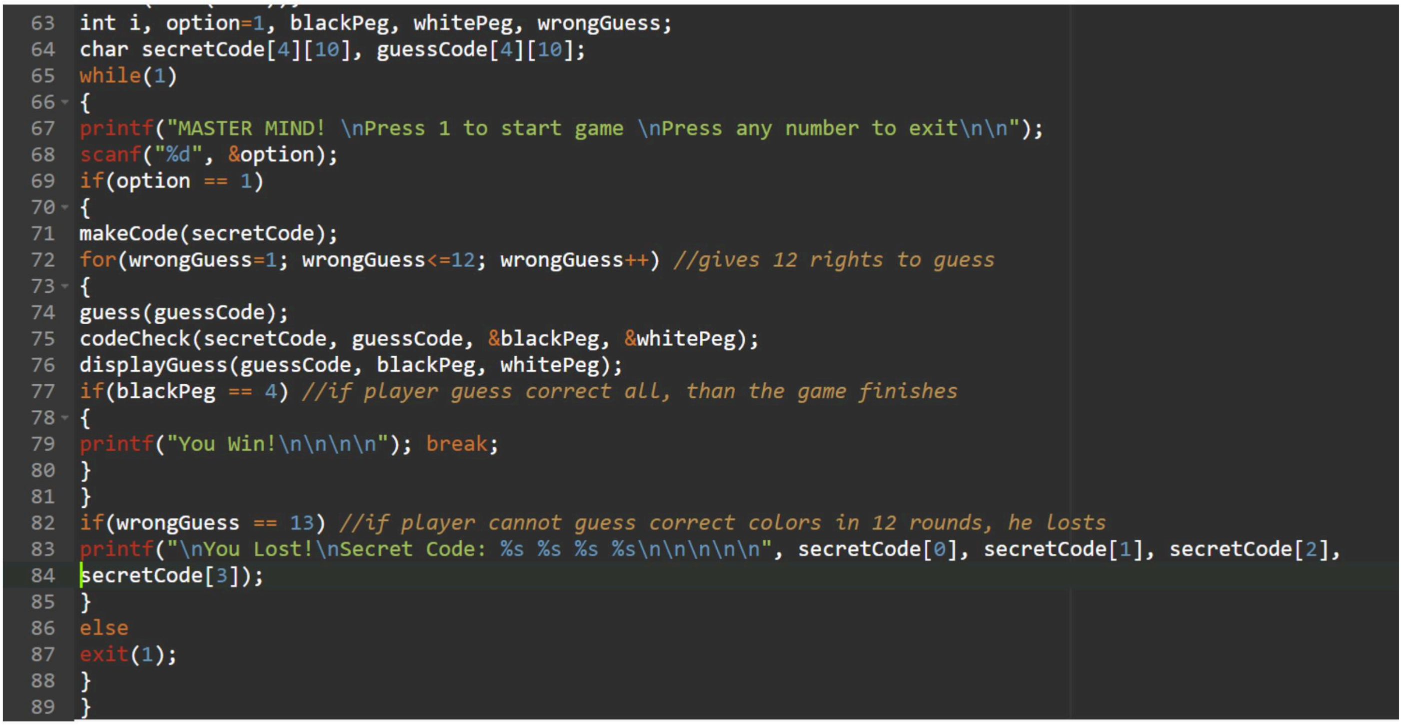
SOURCE CODE



```c
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include<time.h>
void makeCode(char secretCode[4][10])
{
int i, randColor;
for(i=0; i<4; i++)
{
randColor = 1 + rand() % 6; //creates a number
switch(randColor) //converts number created to a string
{
case 1: strcpy(secretCode[i], "red"); break;
case 2: strcpy(secretCode[i], "yellow"); break;
case 3: strcpy(secretCode[i], "green"); break;
case 4: strcpy(secretCode[i], "blue"); break;
case 5: strcpy(secretCode[i], "white"); break;
case 6: strcpy(secretCode[i], "black"); break;
}
}
}
void guess(char guessCode[4][10])
{
int i;
printf("\nEnter your guess:\n");
for(i=0; i<4; i++)
scanf("%s", guessCode[i]);
}
void codeCheck(char secretCode[4][10], char guessCode[4][10], int *blackPeg, int *whitePeg)
{
int i, j, checkSecret[4] = {1,1,1,1}, checkGuess[4] = {1,1,1,1};
```



```c
*blackPeg = *whitePeg = 0;
for(i=0; i<4; i++) //if secret and guess's position and color are same, blackpeg increases and mark "check'
if(strcmp(guessCode[i], secretCode[i]) == 0)
{
++*blackPeg;
checkSecret[i] = checkGuess[i] = 0;
}
for(i=0; i<4; i++)
for(j=0; j<4; j++)
if(strcmp(secretCode[i],guessCode[j]) == 0 && checkGuess[i] && checkSecret[j] && i != j)
{// determines crushes and eliminates extra whitePegs
++*whitePeg;
checkSecret[j] = checkGuess[i] = 0;
}
}
void displayGuess(char guessCode[4][10], int blackPeg, int whitePeg)
{
int i;
printf("\nYour Guess\t\t\t\tYour Score\n");
for(i=0; i<4; i++)
printf("%s ", guessCode[i]);
printf("\t\t");
for(i=0; i<blackPeg; i++)
printf("black ");
for(i=0; i<whitePeg; i++)
printf("white ");
printf("\n\n");
}
int main()
{
srand(time(NULL));
```



```
int i, option=1, blackPeg, whitePeg, wrongGuess;
char secretCode[4][10], guessCode[4][10];
while(1)
{
printf("MASTER MIND! \nPress 1 to start game \nPress any number to exit\n\n");
scanf("%d", &option);
if(option == 1)
{
makeCode(secretCode);
for(wrongGuess=1; wrongGuess<=12; wrongGuess++) //gives 12 rights to guess
{
guess(guessCode);
codeCheck(secretCode, guessCode, &blackPeg, &whitePeg);
displayGuess(guessCode, blackPeg, whitePeg);
if(blackPeg == 4) //if player guess correct all, than the game finishes
{
printf("You Win!\n\n\n\n"); break;
}
}
if(wrongGuess == 13) //if player cannot guess correct colors in 12 rounds, he losts
printf("\nYou Lost!\nSecret Code: %s %s %s %s\n\n\n\n\n", secretCode[0], secretCode[1], secretCode[2],
secretCode[3]);
}
else
exit(1);
}
}
```

Standard libraries used :

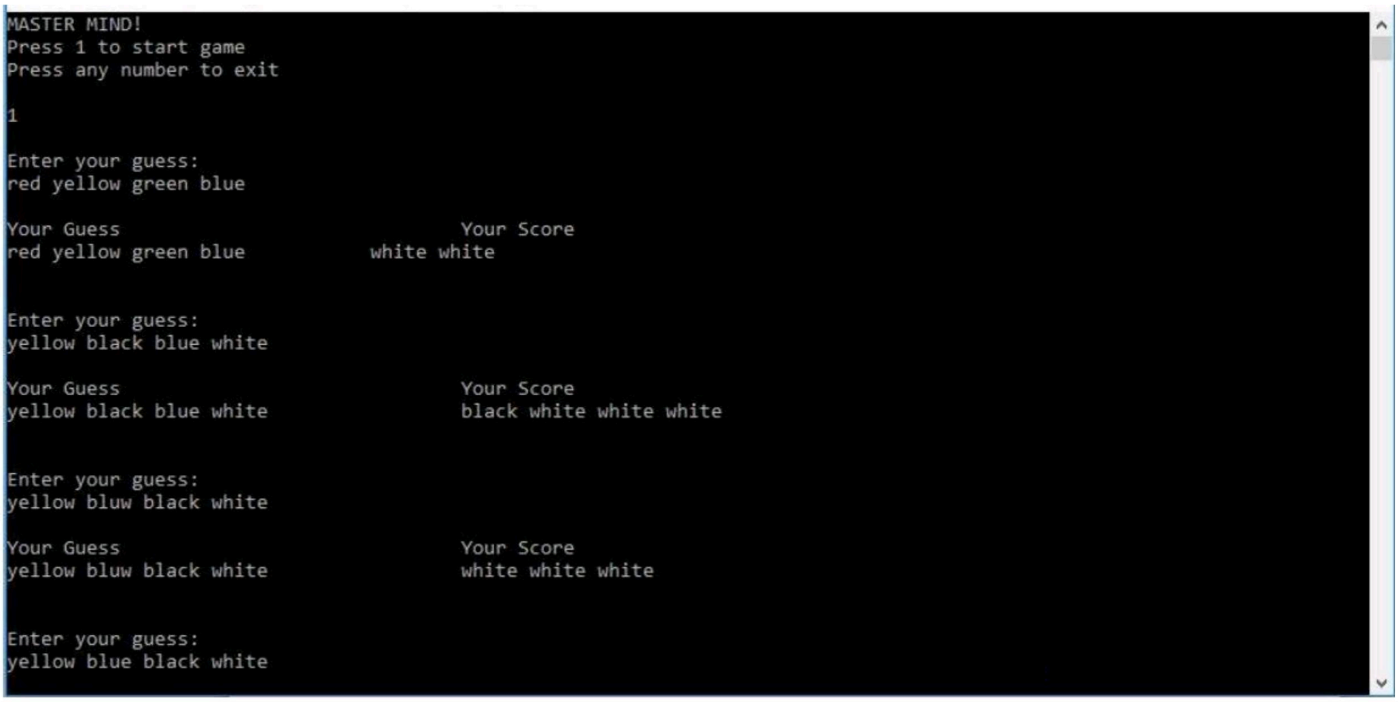
1. stdio.h: Input/Output functions
2. stdlib.h: stands for standard library
3. string.h : String functions
4. time.h : Date and time functions

Some functions used in the code:

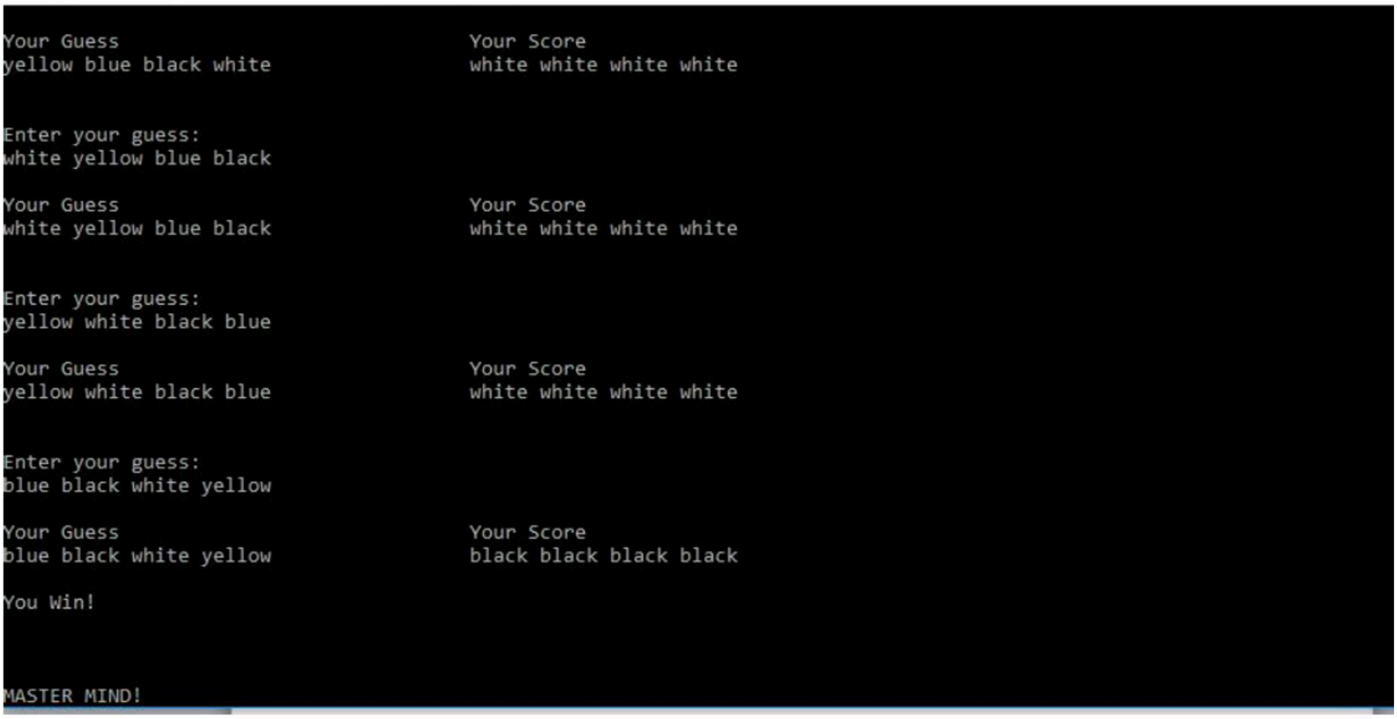
1. *rand() :* rand() is used to generate a series of random numbers.
2. *srand() :* The srand() function sets the starting point for producing a series of pseudo-random integers.

3. <u>srand(time(NULL)):</u>*makes use of the computer's internal clock to control the choice of the seed. Since time is continually changing, the seed is forever changing.*

OUTPUT



```
MASTER MIND!
Press 1 to start game
Press any number to exit

1

Enter your guess:
red yellow green blue

Your Guess                              Your Score
red yellow green blue           white white


Enter your guess:
yellow black blue white

Your Guess                              Your Score
yellow black blue white                 black white white white


Enter your guess:
yellow bluw black white

Your Guess                              Your Score
yellow bluw black white                 white white white


Enter your guess:
yellow blue black white
```



```
Your Guess                              Your Score
yellow blue black white                 white white white white


Enter your guess:
white yellow blue black

Your Guess                              Your Score
white yellow blue black                 white white white white


Enter your guess:
yellow white black blue

Your Guess                              Your Score
yellow white black blue                 white white white white


Enter your guess:
blue black white yellow

Your Guess                              Your Score
blue black white yellow                 black black black black

You Win!



MASTER MIND!
```