Project 2

Mastermind Game

Version 2

CSC 5 46023

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Introduction

Name of the game: Mastermind

Mastermind is a code solving game that requires a player to guess what the code is with several clues upon the way.

For example, the code could be 4 – 2 – 1 -3 and your guess could be 1 – 4 – 3 – 2.

The output would be you have four digits out of place.

If the code is solved, you win.

Summary

Size of code: 257 lines

Number of variables: 23 variables

Number of methods: 7

This project included many of the topics discussed so far in class. I used pass by reference and pass by value in a function to allow for if the variable is in the wrong place.

Description

The main point of the program I coded was If-else-if statements. A while loop was made to determine the number of guesses allowed.

Pseudo code

Execution Starts Here!

Variables

Score counter

Number of guesses allowed

Code to guess variables

Guess variables

Array variable

File variable

Retry variable

    Pre - variable inputs

    Random code generator

        Input guesses for code

        Determining how many are correct and score they receive

            writing to the file

    Determining if you lose

    Retry

Wrong Place function

check if in the wrong place counter

check if guess is in wrong place

output

Research

"Random number generator." - C++ Articles. 21 July 2014. Web. <http://www.cplusplus.com/articles/EywTURfi/>.

Variable Names

Float: score	**Score tracker**
Int: guess	**Number of guesses**
Char: redo	**Retry variable**
Int: guess1	**First number of guess**
Int: guess2	**Second number of guess**
Int: guess3	**Third number of guess**
Int: guess4	**Fourth number of guess**
Short: code1	**First number of code**
Short: code2	**Second number of code**
Short: code3	**Third number of code**
Short: code4	**Fourth number of Code**
Int: i	**For the for loop only**
Int n	**Function variables**
Int x	**Function variables**
Int i	**Function variables**
Int y	**Function variables**
Int q	**Function variables**
Int w	**Function variables**
Int e	**Function variables**
Int r	**Function variables**
Float &s	**Function variables**
Int wPlace	**Wrong place counter**

Variables types and Topics

Chapter 6 Gaddis	File input variable	Line 36
Chapter 6 Savitch	File open	Line 72
	Output to file	Line 74
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Chapter 4 Savitch	random	Line 45
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Chapter 5 Gaddis	if	Line 173
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Chapter 2 Gaddis	float	Line 23
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Chapter 7 Gaddis	Array	Line 35
Chapter 6 Gaddis	function	Line 18
Chapter 4 Savitch	Pass by Reference	Line 18
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Actual Code

```
/*
 * File:   main.cpp
 * Author: David-Snow
 *
 * Created on July 13, 2014, 6:27 PM
 */
//system libraries
#include <iostream>
#include <cstdlib>
#include <fstream>
using namespace std;

//User Libraries

//Global Constants

//Function Prototypes
void wPlace(int n, int i, int x, int y, int q, int w, int e, int r, float &s);
//Execution Starts Here!
```

```
int main(int argc, char** argv) {
    //variables
    float score; //score counter
    int guess; //number of guesses allowed
    //code to guess variables
    short code1;
    short code2;
    short code3;
    short code4;
    //guess variables
    int guess1;
    int guess2;
    int guess3;
    int guess4;
    //array
    int numCor[1] = {0};
    //file variable
    ifstream output;
    //retry variable
    char redo;
```

```
do{
   //pre - variable inputs
   score = 0.0;
   guess = 1;
   //random code generator
   srand(time(NULL));
   code1 = rand() % 4 + 1;
   code2 = rand() % 4 + 1;
   code3 = rand() % 4 + 1;
   code4 = rand() % 4 + 1;
   while (guess <= 10){
      //input guesses for code
      cout << "Input the first number you guess:(1-4) ";
      cin >> guess1;
      cout << "Input the second number you guess:(1-4) ";
      cin >> guess2;
      cout << "Input the third number you guess:(1-4) ";
      cin >> guess3;
      cout << "Input the fourth number you guess:(1-4) ";
      cin >> guess4;
```

```
//determining how many are correct and score they receive
if (guess1 == code1 && guess2 == code2 && guess3 == code3
    && guess4 == code4){
  numCor[0] += 4;
  cout << guess4 << code4 <<endl;
  cout << guess3 << code3 <<endl;
  cout << guess2 << code2 <<endl;
  cout << guess1 << code1 <<endl;
  cout << code1 << " ";
  cout << code2 << " ";
  cout << code3 << " ";
  cout << code4 << endl;
  cout << "All positions are correct. You Win!!! " << endl;
  cout << "It took you " << guess << " guesses. " << endl;
  for(int i  = 10; i >= guess; i--){
    score = score + 50.0;
  }

  cout << "Your score is " << score << endl;
```

```
        cout << numCor[0] << " is the total amount of correct guesses
"
             "during the game." << endl;
        //writing to the file
        output.open ("Score.dat");
        if (output.is_open()){
           output >> score;
           output.close ();
        }
        else{
           cout << "The file is not open.";
        }
        switch (guess){
           case 1:


           case 2:


           case 3:


           case 4:
```

```
            case 5:
               cout << "Congratulations!! You got it in half or"
                    " less of the number of guesses allowed" << endl;
            default:
               ;
         }
         break;
      }
      else if (guess2 == code2 && guess3 == code3 && guess4 ==
code4){
         numCor[0] += 3;
         cout << "Three guesses are correct " << endl;
         score = score + 30.0;
         guess ++;
      }
      else if (guess1 == code1 && guess3 == code3 && guess4 ==
code4){
         numCor[0] += 3;
         cout << "Three guesses are correct " << endl;
```

```
            score = score + 30.0;
            guess ++;
        }
        else if (guess1 == code1 && guess2 == code2 && guess4 ==
code4){
            numCor[0] += 3;
            cout << "Three guesses are correct " << endl;
            score = score + 30.0;
            guess ++;
        }
        else if (guess1 == code1 && guess2 == code2 && guess3 ==
code3){
            numCor[0] += 3;
            cout << "Three guesses are correct " << endl;
            score = score + 30.0;
            guess ++;
        }
        else if (guess3 == code3 && guess4 == code4){
            numCor[0] += 2;
            cout << "Two guesses are correct " << endl;
```

```
    score = score + 20.0;
    guess ++;
}

else if (guess3 == code3 && guess4 == code4){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
    guess ++;
}
else if (guess2 == code2 && guess4 == code4){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
    guess ++;
}
else if (guess2 == code2 && guess3 == code3){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
```

```
    guess ++;
}
else if (guess1 == code1 && guess4 == code4){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
    guess ++;
}
else if (guess1 == code1 && guess3 == code3){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
    guess ++;
}
else if (guess1 == code1 && guess2 == code2){
    numCor[0] += 2;
    cout << "Two guesses are correct " << endl;
    score = score + 20.0;
    guess ++;
}
```

```
else if (guess4 == code4){
   numCor[0] += 1;
   cout << "One guess is correct " << endl;
   score = score + 10.0;
   guess ++;
}
else if (guess3 == code3){
   numCor[0] += 1;
   cout << "One guess is correct " << endl;
   score = score + 10.0;
   guess ++;
}
else if (guess2 == code2){
   numCor[0] += 1;
   cout << "One guess is correct " << endl;
   score = score + 10.0;
   guess ++;
}
else if (guess1 == code1){
   numCor[0] += 1;
```

```
        cout << "One guess is correct " << endl;
        score = score + 10.0;
        guess ++;
    }
    else{
        cout << "No guess is correct" << endl;
        guess ++;
    }
    wPlace(guess1, guess2, guess3, guess4,
           code1, code2, code3, code4, score);
    cout << guess4 << endl;
}
//determining if you lose
if (guess == 11){
    cout << code1 << " ";
    cout << code2 << " ";
    cout << code3 << " ";
    cout << code4 << endl;
    cout << "You lose!!!" << endl;
    cout << "Number of guesses was 10." << endl;
```

```
            cout << "Better luck next time." << endl;
            cout << "Your score is " << score << endl;
        }
        //Retry
        cout << "Retry? Y/N ";
        cin >> redo;

    }while (redo == 'y' || redo == 'Y');
    return 0;
}
//wrong place function
void wPlace(int n, int i, int x, int y, int q, int w, int e, int r, float &s){
    int wPlace = 0; //check if in the wrong place counter
    //check if guess is in wrong place
    if(y != r &&
      (r == x
      || r == i
      || r == n)){
        wPlace += 1;
        s = s + 5.0;
```

```
}
if(n != q &&
  (q == i
  || q == x
  || q == y)){
    wPlace += 1;
    s = s + 5.0;
}
if (i != w &&
   (w == n
   || w == x
   || w == y)){
    wPlace += 1;
    s = s + 5.0;
}
if(x != e &&
  (e == n
  || e == i
  || e == y)){
    wPlace += 1;
```

```
        s = s + 5.0;
    }
    //output
    cout << "You have " << wPlace <<
          " guesses in the wrong spot." << endl;
}
```