Project 2

Mastermind Game

Version 2

CSC 5 46023

Name: David Snow

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**Table of Contents**

**Table of Contents** ...................................................................................................................... 2

**1- Introduction** ............................................................................................................................ 3

Gameplay and Rules ...........................................................................................................

**2- Summary** …………………………………………………………………………………………………………………………… 3

Lines of code

Variables

Difficulties

**3- Description** ............................................................................................................................. 3

**4- Flowchart** ................................................................................................................................

See j-Peg Attached to Project

**5- Pseudo-Code** ........................................................................................................................... 4

**6- Research** …………………………....................................................................................................... 5

**7- Variable Types and topics** ........................................................................................................ 5

**Variable names**

**Variable Types and topics**

**8- Actual Code** ……………………........................................................................................................ 6

**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 |
|  | File close | Line 75 |
| **Chapter 4 Savitch** | random | Line 45 |
| **Chapter 4 Gaddis** | switch | Line 80 |
| **Chapter 5 Gaddis** | if | Line 173 |
|  | Else if | Line 97 |
|  | If Else | Line 73 |
|  | Do While | Line 39 |
|  | While | Line 49 |
| **Chapter 2 Gaddis** | float | Line 23 |
|  | Int | Line 24 |
|  | Short | Line 26 |
|  | Char | Line 38 |
|  | Cout | Line 51 |
|  | Cin | Line 52 |
| **Chapter 5 Gaddis** | For | Line 68 |
|  | File input variable | Line 36 |
|  | File open | Line 72 |
| **Chapter 7 Gaddis** | Array | Line 35 |
| **Chapter 6 Gaddis** | function | Line 18 |
| **Chapter 4 Savitch** | Pass by Reference | Line 18 |
|  | Pass by Value | Line 18 |
|  | Defaulted parameters | Line 18 |

**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;**

**}**