Project II

<**Code Adventure II**>

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Overview

Code Adventure II is an interactive game that is based on randomized results depending on the player's input. It starts off by giving the player a total of ten coins: five gold coins and five silver coins. It also offers the player a choice from eight different doors. The doors are randomly assigned to different outcomes that may increment or decrement the total amount of coins the player has. In order to win the game, the player must find the exit with an amount greater than zero in terms of coins. If the player losses all of his/her coins before finding the exit, the player automatically losses.

Highlights

The game has five different possible rooms. The following contains brief descriptions of each room.

- ***The Room of Happiness***: This room is basically a sanctuary for the player. The code output displays a happy face encrypted in code and does not increment or decrement the amount of coins the player has. It simply encourages the player to keep going.
- ***The Genie Room***: This room is a jackpot for the player. Genie is a compassionate character that likes to give money away to newcomers. Genie grants the player five gold coins and five silver coins.
- ***The Getaway Room***: Depending on the player's favorite place, the getaway room takes the player to his/her favorite destination. The con to this mini-vacation is that the trip is not free. The unexpected getaway charges the player five gold coins and five silver coins.
- ***The Monster Room***: All hail mercy! The monster room beholds the worst nightmare by containing the monster of the player's worst fear. This is basically the end because the monster has no mercy and strips away all of the player's coins. This is an automatic loss for the player and ends the game.
- ***The Game Room***: The game room is home to our 'rock, paper, scissors' fan named Bob. In this room, the player is challenged to a game of 'rock, paper, scissors' in exchange of five gold coins. Bob and the player go at it for three rounds, and whoever wins takes the five gold coins.
- ***The Birthplace Room***: No births in here! So do not worry. This room simply takes the player back to his birthplace where he happens to reunite with long lost family members. The family members are in need of monetary help, therefore the player is asked if he/she would like to donate five gold coins and five silver coins. The player has the option to refuse to help.
- ***The Letter Room***: In this room the player is given a letter to read. The letter has been left as a reward from the player's favorite relative. With it, they have left five silver coins for the player to use.

- ***The Exit***: This is every player's goal. If the player has an amount greater than zero in terms of coins and reaches this room, the player has won and finished the game!

Summary of Code

Project size: 339 lines of code.
Number of variables: 22 (12 characters/9 integers/ 1 constant integer).
List of libraries: <algorithm>, <cstdlib>, <ctime>, <fstream>, <iostream>, & <string>.

This game was built off of the primary game named 'Code Adventure'. As mentioned in the previous project, the game was easy to modify and expandable; which bring us to the creation of 'Code Adventure II'. This game has more doors to choose from, with more complex code to execute as well. The newer version has C++ concepts such as file I/O, functions (void, int, etc.), two-dimensional arrays, and string functions. The most difficult part of coding this game was reading the input file and creating a two-dimensional array from the same file input using the string class.

Pseudocode

```
System Libraries
User Defined Libraries
Global Constants
Function Prototypes
  Function int RPS
Execute Here.
Declare variables
   Seed randomization
      Inputs for the game
      Basic description of game rules
      Loop the input/output code
         Total coins = gold + silver
         Player's choice - Input
        Shuffles the choice output so door assignment won't always be same
        Choice is minus 1 due to counting 0 as an integer
        Directly correlate door choice to array of randomization
        Output door assignment using switch
           Case 1
              Calculations
```

Case 2

Zero coins ends the game

Case 3

Displays code figure

Case 4

Figuratively setting tCoins equal to zero so it ends loop

Case 5

Calculations

Case 6

Local variable

Input answer to help call

Outputs depending on answer

Case 7

Declare local variable

Function call

Decision upon result of game

Case 8

Local variable

Open file from local disk

Read from file

String array displayed as 2D character array

Close file

As long as the player has coins, game continues

Asks the player if he/she would like to repeat the game

End Here.

Function definitions

Define variables

Loop for 3 rounds

Input choices

Output results

Calculations

Final decision upon sum of points

Code Adventure Flowchart

Refer to 'Code-Adventure II' flowchart saved separately within the same Project 2 folder.

C++ Constructs

Book: *Problem Solving with C++* 8th Ed, by Walter Savitch.

Chapter	Section	Concept
2 : C++ Basics	2.1: Variables and Assignments	Declared variables in lines 20-29. Used 'int' and 'char' as variable declarations.
	2.2: Input and Output	Used 'cout' and 'cin' throughout program. In other words, I/O (ex. lines 39-40 or 63-64).
	2.3: Data Types and Expressions	Used type 'int' in lines 26-29 & type 'char' in lines 21-24.
	2.4: Simple Flow of Control	Used comparison operator '!=' in line 145 and '||' in line 153 and "==" as well in line 153. Also used outer do-while loop on lines 34-153 and inner do-while loop on lines 57-145.
	2.5: Program Style	Comments are found throughout code after '//' and indenting found after loops and switch statement.
3: More Flow Control	3.1: Using Boolean Expressions	Boolean expression used in lines 145 and 153.
	3.2: Multi-way Branches	Used 'switch' statement starting at line 77, 'cases' listed at lines 78, 93, 103, 121, 128. And 'break' statements followed in lines 92, 102, 120, 127, & 142. Used 'if-else' statements in lines: 185-199, 218-229, 308-328.
	3.3: More About C++ Loop Statements	Used a combination of do-while and Boolean as indicated in the lines above in section 3.1 and 2.4.
	3.4: Designing Loops	Used concept of 'Nested' loops by using multiple loops. Code contains 'blocks' of code (ex. lines 77-143).
4: Procedural Abstraction and Functions That Return a Value	4.2: Predefined Functions	Used pre-defined functions in lines 26-27. Also seen in line 32 (srand) and 69 (random_shuffle). Used different header files (algorithm, ctime, cstdlib, and iostream). Lines 7-10.
	4.5: Scope and Local Variables	Used a 'local' variable in line 68.

5: Functions for All Subtasks	5.1: *void* Functions	Used a function of type 'int' in line 216. Declared up top in line 21, and defined in lines 283-339. Variables are local only within function.
6: I/O Streams as an Introduction to Objects and Classes	6.1: Streams and Basic File I/O	Used <fstream> library. Opened file in line 247. Read from file in lines 249-251. Close file in line 265.
	6.2: Tools from Stream I/O	Used 'getline' to facilitate the file input.
7: Arrays	7.1: Introduction to Arrays	Initialized an array at line 68.
	7.3: Programming with Arrays	Sorted an array using 'random_shuffle' in line 69.
	7.4: Multidimensional Arrays	Used a two-dimensional array in lines 253-258 using a 'for' loop.
8: Strings and Vectors	8.2 The Standard *string* Class	Used class <string>. Declared a string variable in line 240 and used I/O using 'getline' in line 250.