**Project 1**

**<LeepFrog Mathematics Game>**

**CSC-5/46024**

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**Introduction**

Title: LeepFrog Mathmatics

My game is LeepFrog Mathematics that I grew up playing on a tablet and absolutely loved. The game comes in an arcade like structure and the first game within the game is called “guess the number I’m thinking of,” which is a game of chance. It is used on long car rides and to entertain young children. Someone [known as the chief in the game] will think of a number and not tell anyone. The player will then try and guess the number the chief is thinking of. If done fair, the chief will usually tell a bystander what the number is, to make sure he or she does not change his/her mind mid-game. But as the code is written the computer will not change its guess therefore it is still following the rules. The point of the game is to try and get the least amount of guesses and beat your personal best record. On your own you make a score card and record the amount of guesses it took you each time and then you can just keep playing and recording until you’re tired. You can return to the same score card days later and play again and record the number of guesses each time till you guessed the correct number as well. This game is meant to pass time, there is no strategy and you try and beat your own best record of least amount of guesses till you got the correct number. The next game within LeepFrog Mathematics is an addition game. You try and do the random addition equation and when I played, we use to get treats if we won from our parents. Like the addition game, the subtraction game, is the same concept only with a random subtraction equation and again when we won our parents gave us treats.

**Summary**

Project size: 200+ lines

The number of variables: about 30

The number of method: 17

My goal was to create an all-age program, that anyone could play and I could use to entertain my young nieces. Therefore, I used the new concepts that we have learned including loops, if/else statements, menus, ect to create a program that is number oriented that they could play and get comfortable with different types of number positive, negative, large, small, ect . The program itself is a work in progress because ultimately I want to make the program with five or six multiple games within it to choose to play. As of right now the ‘arcade’ consist of three games and that’s the guess the number I’m thinking of, add with me, and subtract with me.

It took about two weeks to develop the outline and the sub-games.

I met a few problems in the process.

I referenced our text book, past homework assignments, and the professor’s online examples to solve them.

**Description**

The main point of this program is how it randomly chooses numbers and can be used as a learning tool.

**Pseudo Code**

*Initialize*

*Prompt to press 1, 2, or 3 in game menu or anything else to exit menu*

*If number 1 is pressed*

*Prompt to guess the random number*

*If number is random number congratulate player*

*Else if number is larger display it’s larger and prompt to guess again*

*Else if number is smaller display it’s smaller and prompt to guess again*

*Play again press P/p or else bool is false and exit sub- game to menu*

*If number 2 is pressed*

*Generate random numbers to be added*

*Prompt to put in answer for random addition equation*

*Output correct answer*

*If answer is correct congratulate player*

*Else answer is wrong and prompt player to play again*

*Play again press P/p or else bool is false and exit sub-game to menu*

*If number 3 is pressed*

*Generate random numbers to be subtracted*

*Prompt to put in answer for random subtraction equation*

*Output correct answer*

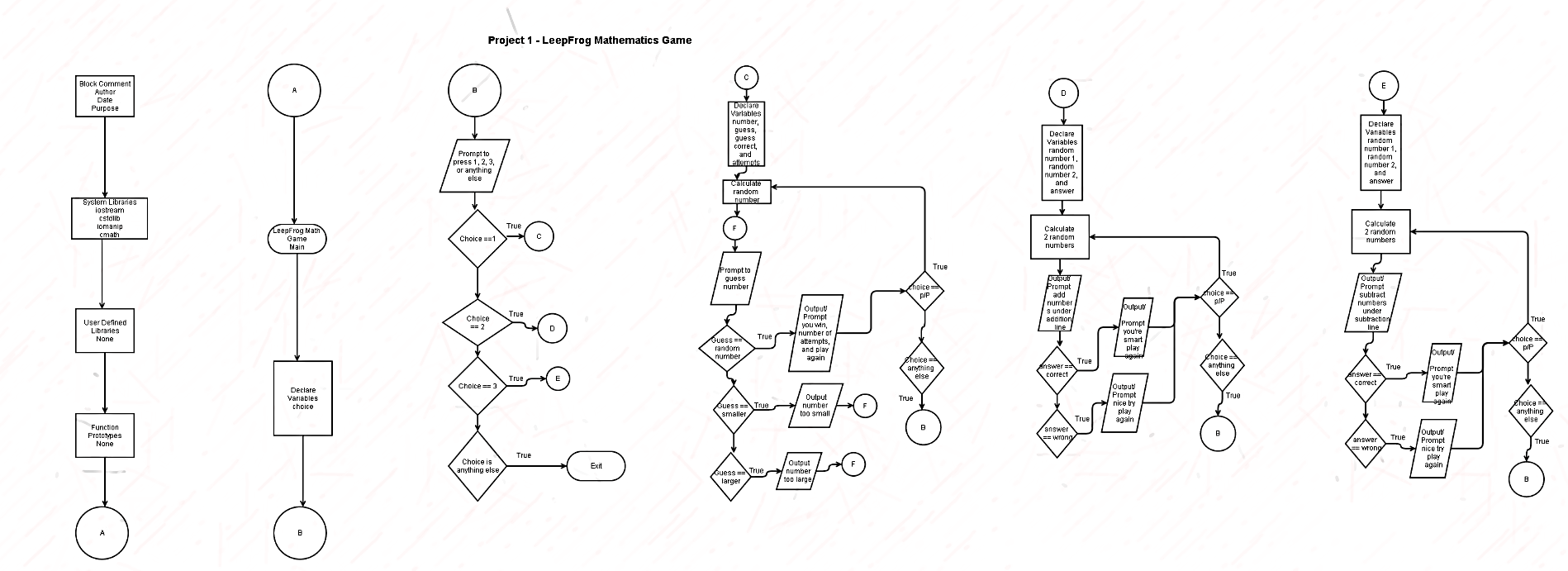
*If answer is correct congratulate player*

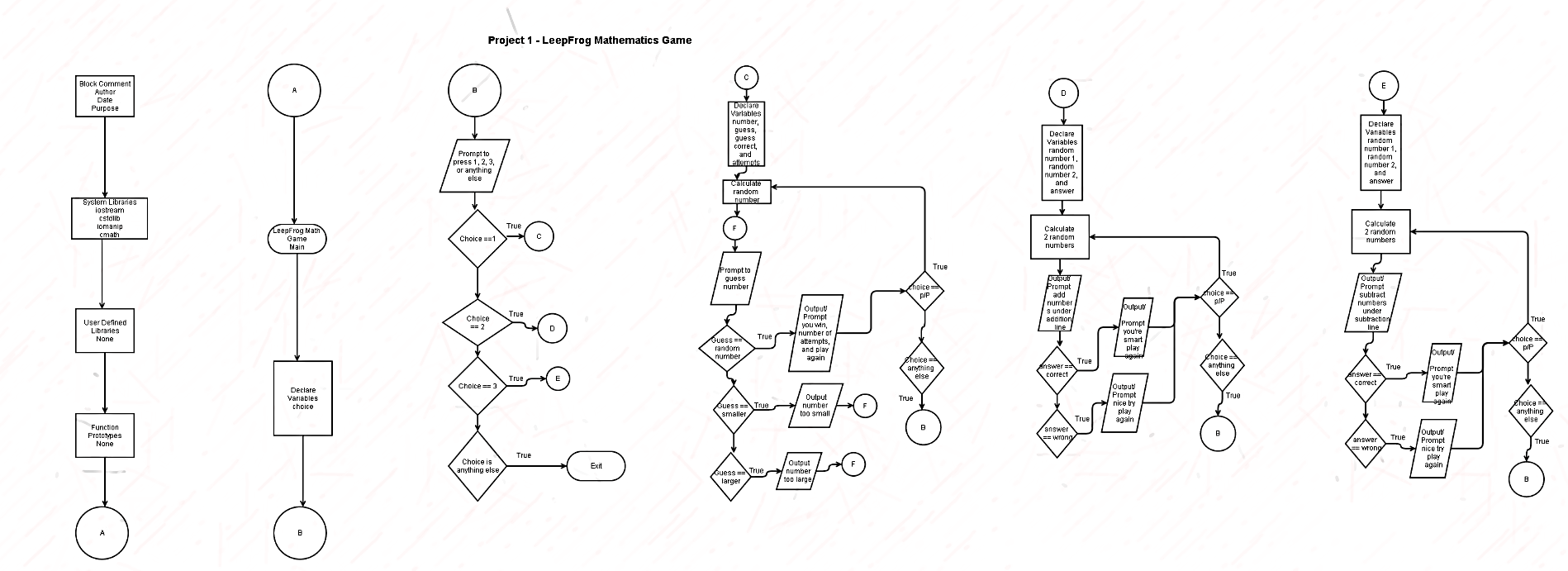
*Else answer is wrong and prompt player to play again*

*Play again press P/p or else bool is false and exit sub-game to menu*

*If anything else pressed*

*Exit menu*

**Project 1 – LeepFrog Mathematics Game FlowChart:**



**Major Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Variable Name** | **Description** | **Location** |
| Char | Choice[] [] | Choose sub-game in menu | Line 20 |
| Integer | number[] | Random number in head to guess | Line 48 |
|  | input\_number[] | Player’s guess | Line 51, Line 70 |
|  | attempts\_count[] | Counts the number of guesses a player enters before guessing correctly | Line 52, Line 82 |
| String Choice | choice | Press P/p to play again | Line 97, Line 150, Line 200 |
| Integer | ran | Generates random number | Line 119, Line 168 |
|  | num1 | 1st random number generated for addition /subtraction equation | Line 123, Line172 |
|  | num2 | 2nd random number generated for addition /subtraction equation | Line 124, Line 173 |
|  | num3 | Answer to addition/subtraction equation | Line 133, Line 182 |
| Loop | do{}while() | Loops the menu | Line 24, Line 220 |
| Bool | play\_again | Repeat game from start if true or return to menu if false | Line 21, Line 45, Line 105, Line 116, Line 158, Line 165, Line 208 |
|  | is\_guess\_correct | Guess random number and output while false | Line 56 |
| Counts | attempts\_counts++ | Counts number of attempts made until random number is guessed | Line 82 |
| Menu | 1 | Guess the number I’m thinking of | Line 31 |
|  | 2 | Add with me | Line 32 |
|  | 3 | Subtract with me | Line 34 |

**Reference**

1. textbook

2. https://github.com/mkvarner/mv2504740/tree/master/Hmwk

3. https://github.com/Riverside-City-College-Computer-

Science/Summer14\_CSC5\_46024/tree/master/ml1150258/Examples

**Program**

// LeepFrog Mathematics – Game

//Libraries

#include <iostream>

#include <cstdlib>

#include<iomanip>

#include<cmath>

using namespace std;

int main(int argc, char\*\* argv)

{

//Declare Variables

char choice;

bool play\_again = true;

//Loop until choice is not in the menu selection

do{

//Start

cout<<"Welcome to my arcade!\n";

cout<<"Lets PLAY!\n";

cout<<"\n";

//Output the menu and input the choice

cout<<"Type 1 to play...guess the number I'm thinking of"<<endl;

cout<<"Type 2 to play...Add with me"<<endl;

cout<<"Type 3 to play...Subtract with me"<<endl;

cout<<"Type anything else to exit menu"<<endl;

cin>>choice;

play\_again=true;

//Place problem solutions in the switch statement

cout<<endl;

switch(choice){

//GAME 1

case '1':{

cout<<"Guess the number I'm thinking of!!!!!"<<endl<<endl;

cout<<"\n";

while(play\_again == true)

{

srand(time(NULL));

int number = rand() % 56 + 1;

//stores random number between 1-56

bool is\_guess\_correct = false;

int input\_number;

int attempts\_count = 1;

// number of attempts player has made

//loops until player enters correct number

while(is\_guess\_correct == false)

{

if(attempts\_count == 1)

{

cout <<"Lets play!\n";

cout << "I'm thinking of a number 1-56.... ";

cout <<"what is it?\n";

}

else

{

cout << "Guess Again: ";

}

cin >> input\_number;

if(input\_number == number)

{

//Player wins!

cout <<"\n";

cout << "You guessed the number in my head in " ;

cout << attempts\_count << " attempts" << ". Now lets play again!"<<endl;

is\_guess\_correct = true;

//stops loop if true

}

else

{

//Player needs to keep guessing

attempts\_count++;

// attempts

if(input\_number < number)

//if player enters number less than random number

{

cout << "Your guess is smaller than the number I'm thinking of." << endl;

}

else

//if player enters number greater than random number

{

cout << "Your guess is greater than the number I'm thinking of." << endl;

}

}

}

//Play again?

string choice;

cout <<"\n";

cout << "Press P to play again or any other key to exit this game";

cout <<" and return to main menu:";

cin >> choice;

//player chooses any other key than P/p it will exit

if(choice != "P" && choice != "p")

{

play\_again = false;

}

}

break;

}

//Add with me

case '2':{

while(play\_again == true)

{

srand(time(0));

const int ran = 999;

int num1, num2, num3, answer;

//Generates random number

num1 = 1 + rand() % ran;

num2 = 1 + rand() % ran;

//outputs the addition problem

cout << "Lets get smart! Add the numbers and then enter your answer...\n";

cout<<"\n";

cout << setw(5) << num1 << endl;

cout << "+ " << setw(3) << num2 << endl;

cout << "\_\_\_\_\_" << endl;

cin >> answer;

num3 = num1 + num2;

std::cin.get();

cout<<"\n";

cout << num3 << " is the correct answer, ";

//If answer is correct outputs

if (answer == num3)

{

cout << "You're so smart!" << endl;

}

//If answer is wrong outputs

else

{

cout << "Nice try. Want to play again?" << endl;}

string choice;

cout <<"\n";

cout << "Press P to play again or any other key to exit this game";

cout <<" and return to main menu:";

cin >> choice;

//player chooses any other key than P/p it will exit

if(choice != "P" && choice != "p")

{

play\_again = false;

}}

break;

}

//Subtract with me

case '3':{

while(play\_again == true)

{

srand(time(0));

const int ran = 999;

int num1, num2, num3, answer;

//generates random number

num1 = 1 + rand() % ran;

num2 = 1 + rand() % ran;

//outputs subtraction problem

cout << "Lets get smart! Add the numbers and then enter your answer...\n";

cout<<"\n";

cout << setw(5) << num1 << endl;

cout << "- " << setw(3) << num2 << endl;

cout << "\_\_\_\_\_" << endl;

cin >> answer;

num3 = num1 - num2;

std::cin.get();

cout<<"\n";

cout << num3 << " is the correct answer, ";

//outputs if answer is correct

if (answer == num3)

{

cout << "You're so smart!" << endl;

cout<< "Want to go another round?\n";

}

//outputs if answer is wrong

else

{

cout << "Nice try. Want to play again?" << endl;}

string choice;

cout <<"\n";

cout << "Press P to play again or any other key to exit this game";

cout <<" and return to main menu:";

cin >> choice;

//player chooses any other key than P/p it will exit

if(choice != "P" && choice != "p")

{

play\_again = false;

}}

break;

}

//exit menu when 1,2, or 3, are not entered

default:{

cout<<"Exit Menu"<<endl<<endl;

}

};

}while(choice >= '1' && choice <='3'); //ends loop i.e. arcade

//Exit stage right!

return 0;