Tic-Tac-Toe

CSC-5
Project 1
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07/18/16

Introduction

Tic-Tac-Toe

Tic-Tac-Toe is played on a three by three grid consisting of squares. There are only two markers allowed in this game: ‘X’ or ‘O’. Hence there can only be two players in the game. The players can either choose who gets to go first or they can flip a coin or play rock, paper, scissors to determine who gets to go first. The person that gets to go first usually has the advantage as long as they place their marker on the center square - square 5. The first player makes their first move by putting their marker on one of the squares, following with the next player and their marker on another square. The squares can only be marked once per game. To win the game, the first player that reaches a row of three of their own markers, wins.

Summary

Project Size: 145
The number of variables: 14
The number of methods: 5

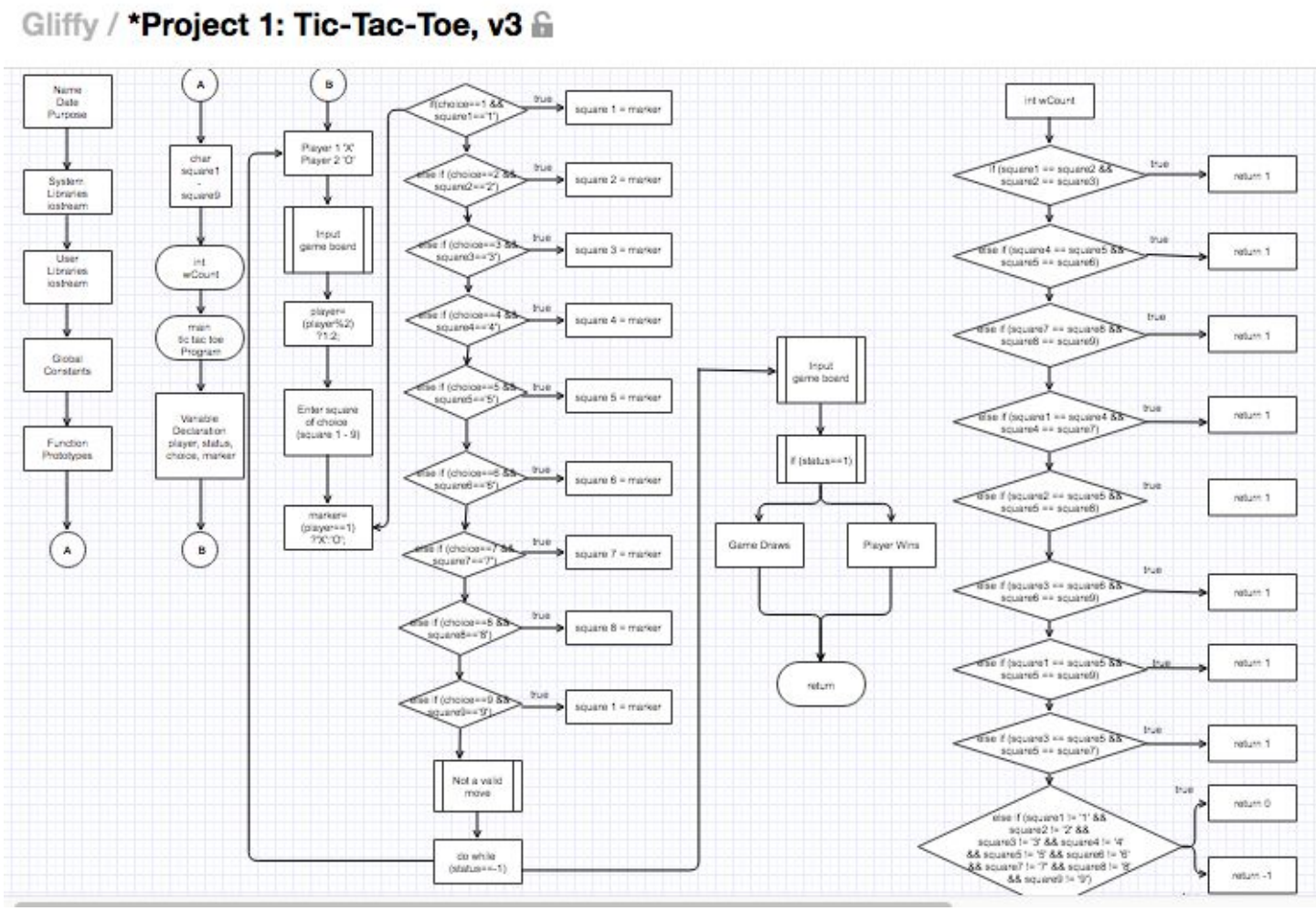
I used basic concepts such as cin and cout for formatting along with using simple character arrays for the squares for the game board. This game is only playable with two players. I did not program for the computer to make automatic replies. I also used if and else if statements nested within do while loops in order for the program to run until the parameters are reached (whether or not a player wins/loses).

There was about a week given for this project and I took the week to choose which game I would like to create a code for. I had assistance from my friends that are computer science majors where they recommended which games that I could make with the limited restrictions I had - only applying the methods that we were taught from chapter one to five.

Description

The main idea of this program is to simulate a game of Tic Tac Toe, where two players can play against each other simply by pressing the numbers 1 to 9 to indicate which squares they would like to place their makers on.

Flow Chart


Gliffy / *Project 1: Tic-Tac-Toe, v3
Name
Date
Purpose
System Libraries
iostream
User Libraries
iostream
Global Constants
Function Prototypes
A
A
char square1 - square9
int wCount
main tic tac toe Program
Variable Declaration player, status, choice, marker
B
B
Player 1 'X' Player 2 'O'
Input game board
player= (player%2) ?1:2;
Enter square of choice (square 1 - 9)
marker= (player==1) ?'X':'O';
if(choice==1 && square1=='1')
square 1 = marker
else if (choice==2 && square2=='2')
square 2 = marker
else if (choice==3 && square3=='3')
square 3 = marker
else if (choice==4 && square4=='4')
square 4 = marker
else if (choice==5 && square5=='5')
square 5 = marker
else if (choice==6 && square6=='6')
square 6 = marker
else if (choice==7 && square7=='7')
square 7 = marker
else if (choice==8 && square8=='8')
square 8 = marker
else if (choice==9 && square9=='9')
square 1 = marker
Not a valid move
do while (status==-1)
true
Input game board
if (status==1)
Game Draws
Player Wins
return
int wCount
if (square1 == square2 && square2 == square3)
else if (square4 == square5 && square5 == square6)
else if (square7 == square8 && square8 == square9)
else if (square1 == square4 && square4 == square7)
else if (square2 == square5 && square5 == square8)
else if (square3 == square6 && square6 == square9)
else if (square1 == square5 && square5 == square9)
else if (square3 == square5 && square5 == square7)
else if (square1 != '1' && square2 != '2' && square3 != '3' && square4 != '4' && square5 != '5' && square6 != '6' && square7 != '7' && square8 != '8' && square9 != '9')
return 1
return 0
return -1

Pseudo Code

Display Tic Tac Toe game board

Display player that will place marker on game board
'X' or 'O'

If player chooses '1' then marker will be on square 1
Else If player chooses '1' then marker will be on square 1
Else If player chooses '2' then marker will be on square 2
Else If player chooses '3' then marker will be on square 3
Else If player chooses '4' then marker will be on square 4
Else If player chooses '5' then marker will be on square 5
Else If player chooses '6' then marker will be on square 6
Else If player chooses '7' then marker will be on square 7
Else If player chooses '8' then marker will be on square 8
Else If player chooses '9' then marker will be on square 9
Else will display Not a valid move

If square 1 is equal to square 2 and square 2 is equal to 3
Then return 1 which means that the game continues
Else if square 4 is equal to square 5 and square 5 is equal to 6
Then return 1, which means that the game is over with result
Else if square 7 is equal to square 8 and square 8 is equal to 9
Then return 1, which means that the game is over with result
Else if square 1 is equal to square 4 and square 4 is equal to 7
Then return 1, which means that the game is over with result
Else if square 2 is equal to square 5 and square 5 is equal to 8
Then return 1, which means that the game is over with result
Else if square 3 is equal to square 6 and square 6 is equal to 9
Then return 1, which means that the game is over with result
Else if square 1 is equal to square 5 and square 5 is equal to 9
Then return 1, which means that the game is over with result
Else if square 3 is equal to square 5 and square 5 is equal to 7
Then return 1, which means that the game is over with result
Else if square 1 to square 9 all equals to each other
Then return 0, which means that the game is over and no result
Else return -1, which means that the game is in progress

Major Variables

Type	Variable Name	Description	Location
Character	square 1	Part of the game board	Enter square of choice
	square 2	Part of the game board	Enter square of choice
	square 3	Part of the game board	Enter square of choice
	square 4	Part of the game board	Enter square of choice
	square 5	Part of the game board	Enter square of choice
	square 6	Part of the game board	Enter square of choice
	square 7	Part of the game board	Enter square of choice
	square 8	Part of the game board	Enter square of choice
	square 9	Part of the game board	Enter square of choice
	marker	To be placed on game board	Enter square of choice
Integer	player	To determine which player which marker	player=(player%2)?1:2;
	status	To see if the game is continuing, ending, or finished	if(status==1)
	choice	Different choices of number	else if(choice==_ && squar_=="")
	wCount	Win count	Int wCount

References

Gaddis, Tony. *Starting Out With C++ from Control Structures to Objects* N.p.: Addison-Wesley, 2014. Print.

Program

```
/*
 * File:   main.cpp
 * Author: Janice Wong
 * Created on July 12, 2016, 16:40 PM
 * Purpose: Project 1 - Tic Tac Toe
 */

//System Libraries
#include <iostream>
using namespace std;

//User Libraries

//Global Constants

//Function Prototypes

//Execution Begins Here!

//Variables for game board
        char square1('1');
           char square2('2');
           char square3('3');
           char square4('4');
           char square5('5');
           char square6('6');
           char square7('7');
           char square8('8');
           char square9('9');

int wCount();   //Win Count
int main(int argc, char** argv){

        //Declare Variables
```

```
   int player = 1,status,choice;
   char marker;

//Process and Output Data
do{
   cout<<"Tic-Tac-Toe"<<endl;
cout<<"This game will need two players."<<endl;
   cout<< "Player 1 (X) - Player 2 (O)" <<endl<< endl;
   cout<< endl;

//Game Board
   cout << "     |     |     " << endl;
   cout << "  " << square1 << "  |  " << square2 << "  |  " << square3 << endl;
   cout << "_____|_____|_____" << endl;
   cout << "     |     |     " << endl;
   cout << "  " << square4 << "  |  " << square5 << "  |  " << square6 << endl;
   cout << "_____|_____|_____" << endl;
   cout << "     |     |     " << endl;
   cout << "  " << square7 << "  |  " << square8 << "  |  " << square9 << endl;
   cout << "     |     |     " << endl << endl;

          player=(player%2)?1:2;

          cout<<"Player "<<player<<":\n";
      cout<<"Enter which square you would like to place your marker: ";
          cin>>choice;

          marker=(player==1)?'X':'O';

      //Conditions of the game

          if (choice == 1 && square1 == '1')
                square1 = marker;
          else if (choice == 2 && square2 == '2')
                square2 = marker;
          else if (choice == 3 && square3 == '3')
                square3 = marker;
          else if (choice == 4 && square4 == '4')
                square4 = marker;
          else if (choice == 5 && square5 == '5')
                square5 = marker;
          else if (choice == 6 && square6 == '6')
                square6 = marker;
```

```
            else if (choice == 7 && square7 == '7')
                square7 = marker;
            else if (choice == 8 && square8 == '8')
                square8 = marker;
            else if (choice == 9 && square9 == '9')
                square9 = marker;
            else
            {
                cout<<"Not a valid move ";
                player--;
                cin.ignore();
                cin.get();
            }
            status=wCount();

            player++;
        }while(status==-1);

    //Show game board again
        cout <<"Tic-Tac-Toe";

        cout << "Player 1 (X) - Player 2 (O)" << endl << endl;
        cout << endl;
        cout << "     |     |     " << endl;
        cout << "  " << square1 << "  |  " << square2 << "  |  " << square3 << endl;
        cout << "_____|_____|_____" << endl;
        cout << "     |     |     " << endl;
        cout << "  " << square4 << "  |  " << square5 << "  |  " << square6 << endl;
        cout << "_____|_____|_____" << endl;
        cout << "     |     |     " << endl;
        cout << "  " << square7 << "  |  " << square8 << "  |  " << square9 << endl;
        cout << "     |     |     " << endl << endl;

        if(status==1)
            cout<<"Player "<<--player<<" Win ";
        else
            cout<<"Player 1 and Player 2 Tied";

        cin.ignore();
        cin.get();
        return 0;
}
```

```
int wCount()
{
	if (square1 == square2 && square2 == square3)
		return 1;
	else if (square4 == square5 && square5 == square6)
		return 1;
	else if (square7 == square8 && square8 == square9)
		return 1;
	else if (square1 == square4 && square4 == square7)
		return 1;
	else if (square2 == square5 && square5 == square8)
		return 1;
	else if (square3 == square6 && square6 == square9)
		return 1;
	else if (square1 == square5 && square5 == square9)
		return 1;
	else if (square3 == square5 && square5 == square7)
		return 1;
	else if (square1 != '1' && square2 != '2' && square3 != '3'
	       && square4 != '4' && square5 != '5' && square6 != '6'
	      && square7 != '7' && square8 != '8' && square9 != '9')
		return 0;
	else
		return -1;
}
```