Riverside City College

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Project 1

Professor Lehr

# Tic-Tac-Toe

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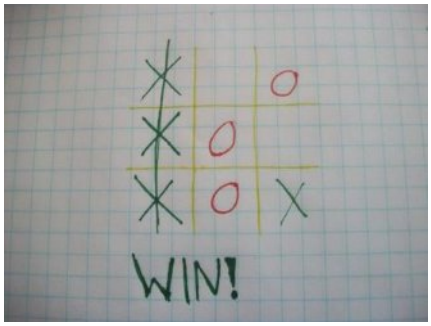
**Introduction**

The Tic-Tac-toe game is a very familiar game to practically anybody. Most commonly played as a paper and pen game for two players, being X and O. Both take turns marking the spaces in a 3×3 grid. The player who succeeds in placing three of their marks in a horizontal, vertical, or diagonal row wins the game.




**References**

- Google is your friend
- Savitch 9th Edition / Gaddis 8th Edition
- C++ forums
-

**Summary**

Lines of code: 145
~ use of constructs: 8

The simplicity of this game allowed me to interpret it into a computer program. It is however, difficult to write in C++ code, but with the help of references around the web, I was able to solve some of the major issues I had.

The issues I faced were function calls and setting up the grid for the program. Other than that, the rest was just a matter of sitting down, coding, and thinking about the logic behind the program.

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This is my first actual project EVER, so I definitely don't expect to receive an A, but nevertheless, this is a great experience for my future prominent career, that being, Computer Engineering (CS, or CHE, not sure yet).

**Description**

The main purpose of this program was to learn to use functions, observe how arrays work, displaying it all out properly, and learning how to manipulate the users input.

**Variables**

| Type | Name | Description | Location |
|---|---|---|---|
| Global char | Grid [3][3] | Grid for tic tac toe | { '1', '2', '3', '4', '5', '6', '7', '8', '9' }; |
| Global char | Player | Player starter | 'X'; |
| Int | a | Number in put for X or O | Void input();<br>Int a; |

**Constructs**

| Syntax of Construct | Location |
|---|---|
| **If( condition)** | **Lines (38, 43, 73 , 94, 105 – 141 odd)** |
| **Else if(condition)** | **Lines (43, 75-89 odd)** |
| **While(condition)** | **Lines (35)** |
| **Void function name();** | **Lines (21-24, 34, 36, 37, 48, 58, 68, 93, 103)** |
| **For(datatype, cond, increment)** | **Lines (60, 61)** |
| **Break;** | **Lines (41, 46)** |
| **== (check if equal)** | **Lines (38, 43, 73-89 odd, 94, 105 – 141 odd)** |
| **++ increment** | **Lines (60, 61)** |
| **Else** | **Lines (97)** |

## Code

```
/*
 * File:   main.cpp
 * Author: Jose Uribe
 * Created on July 14, 2016
 * Purpose:
 */

//System Libraries
#include <cstdlib>   //input / output
#include <iostream>  //Input/Output Library
#include <cmath>     //Math Library
#include <iomanip>   //Format Library

//User libraries. We don't have these yet

//Global constant libraries/conversions
char grid[3][3] = { '1', '2', '3', '4', '5', '6', '7', '8', '9' };
char player = 'X';

//Function Prototypes
void Display();
void Input();
void PlayerTurn();
char Win();
//Execution Begins Here!

using namespace std;


int main(){
    //Declare Variables

    //Input Data
    Display();
    while (1){
        Input();
        Display();
        if (Win() == 'X')
        {
            cout << "X wins!" << endl;
            break;
        }
        else if (Win() == 'O')
        {
            cout << "O wins!" << endl;
            break;
        }
        PlayerTurn();

    }
    //Output
```

```
53      //Exit Stage Right!
54
55      return 0;
56  }
57
58  void Display(){
59      cout << "Tic-Tac-Toe " << endl;
60      for (int i = 0; i < 3; i++){
61          for (int j = 0; j < 3; j++){
62              cout << grid[i][j] << " ";
63          }
64          cout << endl;
65      }
66  }
67
68  void Input(){
69      int a;
70      cout << "Press the number of the field: ";
71      cin >> a;
72
73      if (a == 1)
74          grid[0][0] = player;
75      else if (a == 2)
76          grid[0][1] = player;
77      else if (a == 3)
78          grid[0][2] = player;
79      else if (a == 4)
80          grid[1][0] = player;
81      else if (a == 5)
82          grid[1][1] = player;
83      else if (a == 6)
84          grid[1][2] = player;
85      else if (a == 7)
86          grid[2][0] = player;
87      else if (a == 8)
88          grid[2][1] = player;
89      else if (a == 9)
90          grid[2][2] = player;
91  }
92
93  void PlayerTurn(){
94      if (player == 'X'){
95          player = 'O';
96          cout << "Player Os turn " << endl;
97      }else{
98          player = 'X';
99          cout << "Player Xs turn " << endl;
100     }
101 }
102
103 char Win(){
104     //first player
105     if (grid[0][0] == 'X' && grid[0][1] == 'X' && grid[0][2] == 'X')
106         return 'X';
107     if (grid[1][0] == 'X' && grid[1][1] == 'X' && grid[1][2] == 'X')
108         return 'X';
```

```
108             return 'X';
109         if (grid[2][0] == 'X' && grid[2][1] == 'X' && grid[2][2] == 'X')
110             return 'X';
111 
112         if (grid[0][0] == 'X' && grid[1][0] == 'X' && grid[2][0] == 'X')
113             return 'X';
114         if (grid[0][1] == 'X' && grid[1][1] == 'X' && grid[2][1] == 'X')
115             return 'X';
116         if (grid[0][2] == 'X' && grid[1][2] == 'X' && grid[2][2] == 'X')
117             return 'X';
118 
119         if (grid[0][0] == 'X' && grid[1][1] == 'X' && grid[2][2] == 'X')
120             return 'X';
121         if (grid[2][0] == 'X' && grid[1][1] == 'X' && grid[0][2] == 'X')
122             return 'X';
123 
124         //second player
125         if (grid[0][0] == 'O' && grid[0][1] == 'O' && grid[0][2] == 'O')
126             return 'O';
127         if (grid[1][0] == 'O' && grid[1][1] == 'O' && grid[1][2] == 'O')
128             return 'O';
129         if (grid[2][0] == 'O' && grid[2][1] == 'O' && grid[2][2] == 'O')
130             return 'O';
131 
132         if (grid[0][0] == 'O' && grid[1][0] == 'O' && grid[2][0] == 'O')
133             return 'O';
134         if (grid[0][1] == 'O' && grid[1][1] == 'O' && grid[2][1] == 'O')
135             return 'O';
136         if (grid[0][2] == 'O' && grid[1][2] == 'O' && grid[2][2] == 'O')
137             return 'O';
138 
139         if (grid[0][0] == 'O' && grid[1][1] == 'O' && grid[2][2] == 'O')
140             return 'O';
141         if (grid[2][0] == 'O' && grid[1][1] == 'O' && grid[0][2] == 'O')
142             return 'O';
143 
144         return '/';
145     }
146 
147 
148 
```

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