Pokhara University

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Lab Report on “Programming Warm-Up”

Submitted to
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Submitted Date

2023/05/29

~\Documents\NetBeansProjects\TTTGame\src\main\java\com\mycompany\tttgame\TTTGame.java

```
1  package com.mycompany.tttgame;
2
3  import java.util.Scanner;
4
5  public class TTTGame {
6      TicTacToe game = new TicTacToe(); // For all TTT board related tasks.
7      char winner; // Who won? - For storing the Winner
8
9      /*
10     * Start the game
11     * Display the results after it is completed.
12     */
13     public void startGame() {
14         game.displayBoard();        //display initial Board
15         playGame();                 //starting the game
16         winner = game.getWinner();  //if game ends it gets the winner
17         printMessage();             //print the winning message
18     }
19
20     /*
21     * Scanner class is used to get [row,col] from standard input
22     * Game is completed if there is a winner or 9 moves have been made.
23     */
24     public void playGame(){
25         Scanner in = new Scanner(System.in);
26         int count = 0; // Count number of turns. If it is 9 it is a draw.
27         char turn; // Is it X's turn or O's turn?
28         int row, col; // Hold board position.
29         // while no one has won and not yet a draw
30         while(game.getWinner() == ' ' && count<9){
31             turn = game.whoseTurn();
32             System.out.println(turn+"'s turn. Type row and col:");
33             do {
34                 row = in.nextInt();
35                 col = in.nextInt();
36                 System.out.println("check");
37             }while(game.getMark(row,col)!=' '); // Is this cell empty?
38             game.putMark(row, col);
39             game.displayBoard();
40             count++;
41         }
42         in.close();
43     }
44     /*
45     * Print Win or Draw message.
46     */
47     public void printMessage() {
48         if(winner=='X')
49             System.out.println("X has won!");
50         else if(winner=='O')
51             System.out.println("O has won!");
52         else
53             System.out.println("It's a draw!");
54     }
55
56
57     public static void main(String[] args){
58         TTTGame ttt = new TTTGame();
59         ttt.startGame();
60     }
61 }
62
```

~\Documents\NetBeansProjects\TTTGame\src\main\java\com\mycompany\tttgame\TicTacToe.java

```java
package com.mycompany.tttgame;

public class TicTacToe{
    char[][] board = new char[3][3]; // TicTacToe board has 3 rows and 3 columns.
    char PLAYER_1 = 'X';
    char PLAYER_2 = 'O';
    char turn; // Whose turn is it? - current turn

    //the constructure
    public TicTacToe() {
        //Initialize the 2D array.
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                board[i][j] = ' ';
            }
        }
        turn ='X';  //X always start's first.
    }
    /*
    * Check 3 rows, 3 cols and 2 diagonals for a win
    * If there is a winner return who won : X or O
    * Otherwise return a blank (space) character.
    */
    public char getWinner() {
        //Checking 3 rows, 3 cols and 2 diagonals for a win
        for (int a = 0; a < 8; a++) {
            String line = "";

            switch (a) {
            case 0:
                for (int i = 0; i < 3; i++) {
                    line += board[0][i];
                }
                break;
            case 1:
                for (int i = 0; i < 3; i++) {
                    line += board[1][i];
                }
                break;
            case 2:
                for (int i = 0; i < 3; i++) {
                    line += board[2][i];
                }
                break;
            case 3:
                for (int i = 0; i < 3; i++) {
                    line += board[i][0];
                }
                break;
            case 4:
//                line = board[0][1] + board[1][1] + board[2][1];       //this suppose to work but it's not
                for (int i = 0; i < 3; i++) {
                    line += board[i][1];
                }
                break;
            case 5:
                for (int i = 0; i < 3; i++) {
                    line += board[i][2];
                }
                break;
            case 6:
                for (int i = 0; i < 3; i++) {
                    line += board[i][i];
                }
```

```
                break;
            case 7:
                for (int i = 0; i < 3; i++) {
                    line += board[i][2-i];
                }
                break;
            }
            //If there is a winner return who won : X or O
            //For X winner
            if("XXX".equals(line)) {
                return 'X';
            }

            // For O winner
            else if ("OOO".equals(line)) {
                return 'O';
            }
        }
        return ' '; //Otherwise return a blank (space) character.
    }

    /*
    * Pretty print the TTT board.
    */
    public void displayBoard() {
        System.out.println("|---|---|---|");
        System.out.println("| " + board[0][0] + " | "+ board[0][1] + " | " + board[0][2] + " |");
        System.out.println("|-----------|");
        System.out.println("| " + board[1][0] + " | " + board[1][1] + " | " + board[1][2] + " |");
        System.out.println("|-----------|");
        System.out.println("| " + board[2][0] + " | " + board[2][1] + " | " + board[2][2] + " |");
        System.out.println("|---|---|---|");
    }

    /*
    * Return the Player who has to put a mark.
    */
    public char whoseTurn() {
        return turn;
    }

    /*
    * Fill the board at [row,col] with X or O
    * depending on whose turn it is
    * then change turn from X to O or O to X.
    */
    public void putMark(int row, int col) {
        board[row][col]=turn;   //Filling board at [row,col] with X or O according 2 turn
        //change turn from X to O or O to X.
        if(turn=='X')
            turn='O';
        else if(turn=='O')
            turn='X';
    }

    /*
    * Return the mark at [row,col] in the board.
    */
    public char getMark(int row, int col) {
        return board[row][col];
    }
}
```

~\Documents\tttOutput.txt

```
C:\Users\bhupe\Documents\NetBeansProjects\TTTGame;

-------------------< com.mycompany.tttgame:TTTGame >--------------------
Building TTTGame 1.0-SNAPSHOT
--------------------------------[ jar ]---------------------------------

--- exec-maven-plugin:3.0.0:exec (default-cli) @ TTTGame ---
|---|---|---|
|   |   |   |
|-----------|
|   |   |   |
|-----------|
|   |   |   |
|---|---|---|
X's turn. Type row and col:
1
1
check
|---|---|---|
|   |   |   |
|-----------|
|   | X |   |
|-----------|
|   |   |   |
|---|---|---|
O's turn. Type row and col:
0
0
check
|---|---|---|
| O |   |   |
|-----------|
|   | X |   |
|-----------|
|   |   |   |
|---|---|---|
X's turn. Type row and col:
2
0
check
|---|---|---|
| O |   |   |
|-----------|
|   | X |   |
|-----------|
| X |   |   |
|---|---|---|
O's turn. Type row and col:
0
1
check
|---|---|---|
| O | O |   |
|-----------|
|   | X |   |
|-----------|
| X |   |   |
|---|---|---|
X's turn. Type row and col:
0
2
```

```
check
|---|---|---|
| O | O | X |
|-----------|
|   | X |   |
|-----------|
| X |   |   |
|---|---|---|
X has won!
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time:  01:34 min
Finished at: 2023-05-27T22:17:55+05:45
------------------------------------------------------------------------
```