

Department of Computer Science
Semester Assignment Spring 2020

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Subject: Object Oriented Programming

Time: (Last date of submission 30th May 2020)

BS (CS,SE)

Instructor: M.Ayub Khan

Note:

At the top of the answer sheet there must be the ID, Name and semester of the concerned Student.

Students must have to provide the output of their respective programs. Students have same answers or programs will be considered fail. Programs in Java or codes should be explained clearly.

As this assignment is online so incase of any ambiguity my Whatsapp no. is 034499121116.

Q1. Create a Tic Tac Toe game in java (use any java tool for coding) and explain it in detail including screen shots.

Ans:

```
import java.util.Arrays;
import java.util.InputMismatchException;
import java.util.Scanner;
```

```
public class TicTacToe {
    static Scanner in;
    static String[] board;
    static String turn;
```

```

public static void main(String[] args) {
    in = new Scanner(System.in);
    board = new String[9];
    turn = "X";
    String winner = null;
    populateEmptyBoard();

    System.out.println("Welcome to 2 Player Tic Tac Toe.");
    System.out.println("-----");
    printBoard();
    System.out.println("X's will play first. Enter a slot number to place X
in:");

    while (winner == null) {
        int numInput;
        try {
            numInput = in.nextInt();
            if (!(numInput > 0 && numInput <= 9)) {
                System.out.println("Invalid input; re-enter slot
number:");
                continue;
            }
        } catch (InputMismatchException e) {
            System.out.println("Invalid input; re-enter slot
number:");
            continue;
        }
        if (board[numInput-1].equals(String.valueOf(numInput))) {
            board[numInput-1] = turn;
            if (turn.equals("X")) {
                turn = "O";
            } else {
                turn = "X";
            }
            printBoard();
            winner = checkWinner();
        } else {

```

```
        System.out.println("Slot already taken; re-enter slot
number:");
        continue;
    }
}
if (winner.equalsIgnoreCase("draw")) {
    System.out.println("It's a draw! Thanks for playing.");
} else {
    System.out.println("Congratulations! " + winner + "'s have
won! Thanks for playing.");
}
}
```

```
static String checkWinner() {
    for (int a = 0; a < 8; a++) {
        String line = null;
        switch (a) {
            case 0:
                line = board[0] + board[1] + board[2];
                break;
            case 1:
                line = board[3] + board[4] + board[5];
                break;
            case 2:
                line = board[6] + board[7] + board[8];
                break;
            case 3:
                line = board[0] + board[3] + board[6];
                break;
            case 4:
                line = board[1] + board[4] + board[7];
                break;
            case 5:
                line = board[2] + board[5] + board[8];
                break;
            case 6:
                line = board[0] + board[4] + board[8];
```

```

        break;
    case 7:
        line = board[2] + board[4] + board[6];
        break;
    }
    if (line.equals("XXX")) {
        return "X";
    } else if (line.equals("OOO")) {
        return "O";
    }
}

for (int a = 0; a < 9; a++) {
    if (Arrays.asList(board).contains(String.valueOf(a+1))) {
        break;
    }
    else if (a == 8) return "draw";
}

System.out.println(turn + "'s turn; enter a slot number to place " +
turn + " in:");
return null;
}

static void printBoard() {
    System.out.println("/---|---|---\\");
    System.out.println("| " + board[0] + " | " + board[1] + " | " + board[2]
+ " |");
    System.out.println("|-----|");
    System.out.println("| " + board[3] + " | " + board[4] + " | " + board[5]
+ " |");
    System.out.println("|-----|");
    System.out.println("| " + board[6] + " | " + board[7] + " | " + board[8]
+ " |");
    System.out.println("/---|---|---\\");
}

```

