**PROJECT – 4**

**PROJECT NAME : TIC-TAC-TOE**

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**PROJECT SUMMARY :**

**Tic-Tac-Toe, often referred to as "X and O," is a classic two-player game that is commonly played on a 3x3 grid. The objective of the game is to be the first player to form a line of three of their symbols (either X or O) horizontally, vertically, or diagonally on the grid.**

**In a Java implementation of Tic-Tac-Toe, you typically start by creating a 3x3 grid using a 2D array. Players take turns to mark a cell on the grid with their symbol. The game alternates between players until one of them wins by forming a line of three symbols or the grid is filled, resulting in a draw.**

**To determine a win, the program checks all possible winning combinations on the grid after each move. If a winning combination is found, the game announces the winner. If the grid is completely filled without a winner, the game declares a draw.**

**A Java Tic-Tac-Toe implementation usually involves classes for the game logic, user interface, and player input. This simple yet engaging game is an excellent way to practice Java programming concepts such as arrays, loops, and conditional statements while providing hours of entertainment.**

**ALGORITHM:**

1. **Both the players choose either X or O to mark their cells.**
2. **There will be a 3×3 grid with numbers assigned to each of the 9 cells.**
3. **The player who choose X begins to play first.**
4. **He enters the cell number where he wishes to place X.**
5. **Now, both O and X play alternatively until any one of the two wins.**
6. **Winning criteria: Whenever any of the two players has fully filled one row/ column/ diagonal with his symbol (X/ O), he wins and the game ends.**
7. **If neither of the two players wins, the game is said to have ended in a draw.**

**INPUT :**

**package sourcecode;**

**import javax.swing.\*;**

**import java.awt.\*;**

**import java.awt.event.\*;**

**import java.util.Random;**

**public class TICTACTOEE implements ActionListener {**

**Random random=new Random();**

**JFrame frame=new JFrame();**

**JButton buttons[]=new JButton[9];**

**JLabel textfield=new JLabel();**

**JPanel Heading\_Panel=new JPanel();**

**JPanel Button\_Panel=new JPanel();**

**boolean player1\_turn=true;**

**TICTACTOEE (){**

**//Frame**

**frame.setVisible(true);**

**frame.setSize(800,800);**

**frame.getContentPane().setBackground(new Color(50,50,50));**

**frame.setLayout(new BorderLayout());**

**//Heading**

**textfield.setFont(new Font("Ink Free",Font.*BOLD*,40));**

**textfield.setBackground(new Color(25,25,25));**

**textfield.setForeground(new Color(25,255,0));**

**textfield.setHorizontalAlignment(JLabel.*CENTER*);**

**textfield. setText("TIC-TAC GAME");**

**textfield.setOpaque(true);**

**//Heading panel**

**Heading\_Panel.setLayout(new BorderLayout());**

**Heading\_Panel.setBounds(0,0,800,100);**

**Heading\_Panel.add(textfield);**

**frame.add(Heading\_Panel,BorderLayout.*NORTH*);**

**//Button pannel**

**Button\_Panel.setLayout(new GridLayout(3,3));**

**Button\_Panel.setBackground(new Color(150,150,150));**

**for(int i=0;i<9;i++){**

**buttons[i]=new JButton();**

**buttons[i].addActionListener(this);**

**buttons[i].setFont(new Font("MV Boli",Font.*BOLD*,100));**

**Button\_Panel.add(buttons[i]);**

**}**

**frame.add(Button\_Panel);**

**firstTurn();**

**}**

**public void actionPerformed(ActionEvent e){**

**for (int i=0;i<9;i++){**

**if (e.getSource()==buttons[i]){**

**if(player1\_turn){ //true X turn**

**if (buttons[i].getText()==""){**

**buttons[i].setForeground(new Color(255,0,0));**

**buttons[i].setText("X");**

**player1\_turn=false;**

**textfield.setText("O TURN");**

**check(); //calling check function**

**}**

**}**

**else{ //O turn false**

**if (buttons[i].getText()==""){**

**buttons[i].setForeground(new Color(0,0,255));**

**buttons[i].setText("O");**

**player1\_turn=true;**

**textfield.setText("X TURN");**

**check(); //calling check function**

**}**

**}**

**}**

**}**

**}**

**public void check() {**

**//X Win Conditions**

**if(buttons[0].getText()=="X" && buttons[1].getText()=="X" && buttons[2].getText()=="X"){**

**XWin(0,1,2); // calling XWin Function**

**}**

**if(buttons[3].getText()=="X" && buttons[4].getText()=="X" && buttons[5].getText()=="X"){**

**XWin(3,4,5); // calling XWin Function**

**}**

**if(buttons[6].getText()=="X" && buttons[7].getText()=="X" && buttons[8].getText()=="X"){**

**XWin(6,7,8); // calling XWin Function**

**}**

**if(buttons[0].getText()=="X" && buttons[3].getText()=="X" && buttons[6].getText()=="X"){**

**XWin(0,3,6); // calling XWin Function**

**}**

**if(buttons[1].getText()=="X" && buttons[4].getText()=="X" && buttons[7].getText()=="X"){**

**XWin(1,4,7); // calling XWin Function**

**}**

**if(buttons[2].getText()=="X" && buttons[5].getText()=="X" && buttons[8].getText()=="X"){**

**XWin(2,5,8); // calling XWin Function**

**}**

**if(buttons[0].getText()=="X" && buttons[4].getText()=="X" && buttons[8].getText()=="X"){**

**XWin(0,4,8); // calling XWin Function**

**}**

**if(buttons[2].getText()=="X" && buttons[4].getText()=="X" && buttons[6].getText()=="X"){**

**XWin(2,4,6); // calling XWin Function**

**}**

**// O Win Conditions**

**if(buttons[0].getText()=="O" && buttons[1].getText()=="O" && buttons[2].getText()=="O"){**

**OWin(0,1,2); // calling OWin Function**

**}**

**if(buttons[3].getText()=="O" && buttons[4].getText()=="O" && buttons[5].getText()=="O"){**

**OWin(3,4,5); // calling OWin Function**

**}**

**if(buttons[6].getText()=="O" && buttons[7].getText()=="O" && buttons[8].getText()=="O"){**

**OWin(6,7,8); // calling OWin Function**

**}**

**if(buttons[0].getText()=="O" && buttons[3].getText()=="O" && buttons[6].getText()=="O"){**

**OWin(0,3,6); // calling OWin Function**

**}**

**if(buttons[1].getText()=="O" && buttons[4].getText()=="O" && buttons[7].getText()=="O"){**

**OWin(1,4,7); // calling OWin Function**

**}**

**if(buttons[2].getText()=="O" && buttons[5].getText()=="O" && buttons[8].getText()=="O"){**

**OWin(2,5,8); // calling OWin Function**

**}**

**if(buttons[0].getText()=="O" && buttons[4].getText()=="O" && buttons[8].getText()=="O"){**

**OWin(0,4,8); // calling OWin Function**

**}**

**if(buttons[2].getText()=="O" && buttons[4].getText()=="O" && buttons[6].getText()=="O"){**

**OWin(2,4,6); // calling OWin Function**

**}**

**}**

**private void XWin(int a, int b, int c) {**

**buttons[a].setBackground(Color.*GREEN*);**

**buttons[b].setBackground(Color.*GREEN*);**

**buttons[c].setBackground(Color.*GREEN*);**

**for(int i=0;i<9;i++){**

**buttons[i].setEnabled(false); //Disable the buttons after win**

**}**

**textfield.setText("!! Congratulations, X Wins");**

**}**

**public void OWin(int a, int b, int c){**

**buttons[a].setBackground(Color.*GREEN*);**

**buttons[b].setBackground(Color.*GREEN*);**

**buttons[c].setBackground(Color.*GREEN*);**

**for(int i=0;i<9;i++){**

**buttons[i].setEnabled(false); //Disable the buttons after win**

**}**

**textfield.setText("!! Congratulations, O Wins");**

**}**

**public void firstTurn(){**

**try {**

**Thread.*sleep*(2000);**

**} catch(Exception e){**

**e.printStackTrace();**

**}**

**if(random.nextInt(2)==0){**

**player1\_turn=true;**

**textfield.setText("X TURN");**

**}**

**else{**

**textfield.setText("O TURN");**

**}**

**}**

**public static void main(String[] args){**

**// TODO Auto-generated method stub**

**new TICTACTOEE();**

**}**

**}**

**OUTPUT :**

**KAVYA**