

TIC TAC TOE GAME IN JAVA

```
import java.util.*;
import java.util.Random;

class TicTacToe
{
    static char[][] board;

    public TicTacToe()
    {
        board = new char[3][3];
        initBoard();
    }

    void initBoard()
    {
        for(int i=0; i<3; i++)
        {
            for(int j=0; j<3; j++)
            {
                board[i][j]= ' ';
            }
        }
    }

    static void dispBoard()
    {
        System.out.println("-----");
        for(int i=0; i<board.length; i++)
        {
            System.out.print("| ");
            for(int j=0; j<board[i].length; j++)
            {
                System.out.print(board[i][j] + " | ");
            }
            System.out.println();
            System.out.println("-----");
        }
    }

    static void placeMark(int row, int col, char mark)
    {
        if(row >=0 && row<=2 &&
           col>=0 && col<=2)
        {
            board[row][col] = mark;
        }
    }
}
```

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```
        else
        {
            System.out.println("Invalid Position");
        }
    }

    static boolean checkColWin()
    {
        for(int j=0; j<=2; j++)
        {
            if(board[0][j]!=' ' && board[0][j] == board[1][j] && board[1][j]
== board[2][j])
            {
                return true;
            }
        }
        return false;
    }

    static boolean checkRowWin()
    {
        for(int i=0; i<=2; i++)
        {
            if(board[i][0]!=' ' && board[i][0] == board[i][1] && board[i][1]
== board[i][2])
            {
                return true;
            }
        }
        return false;
    }

    static boolean checkDiagWin()
    {
        if(board[0][0]!=' ' && board[0][0] == board[1][1]
&& board[1][1] == board[2][2]
||board[0][2]!=' ' && board[0][2] == board[1][1]
&& board[1][1] == board[2][0])
        {
            return true;
        }
        else
        {
            return false;
        }
    }
}
```

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```
static boolean checkDraw()
{
    for(int i=0; i<=2; i++)
    {
        for(int j=0; j<=2; j++)
        {
            if(board[i][j] == ' ')
            {
                return false;
            }
        }
    }
    return true;
}

abstract class Player
{
    String name;
    char mark;
    abstract void makeMove();

    boolean isValidMove(int row, int col)
    {
        if(row >= 0 && row <=2 &&
           col >=0 && col<=2)
        {
            if(TicTacToe.board[row][col] == ' ')
            {
                return true;
            }
        }
        return false;
    }
}

class HumanPlayer extends Player
{
    HumanPlayer(String name, char mark)
    {
        this.name = name;
        this.mark = mark;
    }

    void makeMove()
```

TIC TAC TOE GAME IN JAVA

```
{
    Scanner scan = new Scanner(System.in);
    int row;
    int col;
    do
    {
        System.out.println("Enter the row and col");
        row = scan.nextInt();
        col = scan.nextInt();
    }while(! isValidMove(row,col));

    TicTacToe.placeMark(row, col, mark);
}
}

class AIPlayer extends Player
{
    AIPlayer(String name, char mark)
    {
        this.name = name;
        this.mark = mark;
    }

    void makeMove()
    {
        Scanner scan = new Scanner(System.in);
        int row;
        int col;
        do
        {
            Random r = new Random();
            row = r.nextInt(3);
            col = r.nextInt(3);
        }while(! isValidMove(row,col));

        TicTacToe.placeMark(row, col, mark);
    }
}

public class LaunchGame
{
    public static void main(String[] args)
    {
        TicTacToe t = new TicTacToe();

        System.out.println("Hi, WELCOME TO TIC TAC TOE GAME");
        System.out.println("1.Want to play with friend");
        System.out.println("2.Want to play with AI");
    }
}
```

TIC TAC TOE GAME IN JAVA

```
System.out.println("3.Exit");
System.out.println("Enter your choice");
int ip;
Scanner s = new Scanner(System.in);
ip = s.nextInt();
if(ip == 1)
{
    System.out.println("Enter Player1 name");
    Scanner n1 = new Scanner(System.in);
    String name1 = n1.nextLine();

    System.out.println("Enter Player2 name");
    Scanner n2 = new Scanner(System.in);
    String name2 = n2.nextLine();

    HumanPlayer p1 = new HumanPlayer(name1,'X');
    HumanPlayer p2 = new HumanPlayer(name2,'O');
    Player cp;
    cp = p1;
    while(true)
    {
        System.out.println(cp.name + " Turn");
        cp.makeMove();

        TicTacToe.dispBoard();

        if(TicTacToe.checkColWin() || TicTacToe.checkRowWin() ||
TicTacToe.checkDiagWin())
        {
            System.out.println(cp.name +" Has Won");
            break;
        }
        else if(TicTacToe.checkDraw())
        {
            System.out.println("Game is draw");
            break;
        }
        else
        {
            if(cp == p1)
            {
                cp = p2;
            }
            else
            {
                cp = p1;
            }
        }
    }
}
```

TIC TAC TOE GAME IN JAVA

```
    }
    }
}

else if(ip == 2)
{
    System.out.println("Enter Your name");
    Scanner n1 = new Scanner(System.in);
    String name1 = n1.nextLine();

    HumanPlayer p1 = new HumanPlayer(name1, 'X');
    AIPlayer p2 = new AIPlayer("AI", 'O');
    Player cp;
    cp = p1;
    while(true)
    {

        System.out.println(cp.name + " Turn");
        cp.makeMove();

        TicTacToe.dispBoard();

        if(TicTacToe.checkColWin() || TicTacToe.checkRowWin() ||
TicTacToe.checkDiagWin())
        {
            System.out.println(cp.name + " Has Won");
            break;
        }
        else if(TicTacToe.checkDraw())
        {
            System.out.println("Game is draw");
            break;
        }
        else
        {
            if(cp == p1)
            {
                cp = p2;
            }
            else
            {
                cp = p1;
            }
        }
    }
}
```

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```
        else if(ip == 3)
        {
            System.out.println("Your are leaving");
        }
        else
        {
            System.out.println("Enter only 1 , 2 or 3");
        }
    }
}
```

From Notepad

```
import java.util.*;
import java.util.Random;

class TicTacToe
{
    static char[][] board;

    public TicTacToe()
    {
        board = new char[3][3];
        initBoard();
    }

    void initBoard()
    {
        for(int i=0; i<3; i++)
        {
            for(int j=0; j<3; j++)
            {
                board[i][j]= ' ';
            }
        }
    }

    static void dispBoard()
    {
        System.out.println("-----");
        for(int i=0; i<board.length; i++)
        {
            System.out.print("| ");
            for(int j=0; j<board[i].length; j++)
```

TIC TAC TOE GAME IN JAVA

```
{
    System.out.print(board[i][j] + " | ");
}
System.out.println();
System.out.println("-----");
}

}

static void placeMark(int row, int col, char mark)
{
    if(row >=0 && row<=2 &&
    col>=0 && col<=2)
    {
        board[row][col] = mark;
    }
    else
    {
        System.out.println("Invalid Position");
    }
}

static boolean checkColWin()
{
    for(int j=0; j<=2; j++)
    {
        if(board[0][j]!=' ' && board[0][j] == board[1][j] &&
board[1][j] == board[2][j])
        {
            return true;
        }
    }
    return false;
}

static boolean checkRowWin()
{
    for(int i=0; i<=2; i++)
    {
        if(board[i][0]!=' ' && board[i][0] == board[i][1] &&
board[i][1] == board[i][2])
        {
            return true;
        }
    }
    return false;
}
```


TIC TAC TOE GAME IN JAVA

```
}

static boolean checkDiagWin()
{
    if(board[0][0]!= ' ' && board[0][0] == board[1][1]
        && board[1][1] == board[2][2]
        ||board[0][2]!= ' ' && board[0][2] == board[1][1]
        && board[1][1] == board[2][0])
    {
        return true;
    }
    else
    {
        return false;
    }
}

static boolean checkDraw()
{
    for(int i=0; i<=2; i++)
    {
        for(int j=0; j<=2; j++)
        {
            if(board[i][j] == ' ')
            {
                return false;
            }
        }
    }
    return true;
}
}
```

```
abstract class Player
{
    String name;
    char mark;
    abstract void makeMove();

    boolean isValidMove(int row, int col)
    {
        if(row >= 0 && row <=2 &&
            col >=0 && col<=2)
        {
            if(TicTacToe.board[row][col] == ' ')
            {
```

TIC TAC TOE GAME IN JAVA

```
        return true;
    }
}
    return false;
}
}

class HumanPlayer extends Player
{
    HumanPlayer(String name, char mark)
    {
        this.name = name;
        this.mark = mark;
    }

    void makeMove()
    {
        Scanner scan = new Scanner(System.in);
        int row;
        int col;
        do
        {
            System.out.println("Enter the row and col");
            row = scan.nextInt();
            col = scan.nextInt();
        }while(! isValidMove(row,col));

        TicTacToe.placeMark(row, col, mark);
    }
}
```

```
class AIPlayer extends Player
{
    AIPlayer(String name, char mark)
    {
        this.name = name;
        this.mark = mark;
    }

    void makeMove()
    {
        Scanner scan = new Scanner(System.in);
        int row;
        int col;
        do
        {
```

TIC TAC TOE GAME IN JAVA

```
        Random r = new Random();
        row = r.nextInt(3);
        col = r.nextInt(3);
    }while(! isValidMove(row,col));

    TicTacToe.placeMark(row, col, mark);
}
}
public class LaunchGame
{
    public static void main(String[] args)
    {
        TicTacToe t = new TicTacToe();

        System.out.println("Hi, WELCOME TO TIC TAC TOE GAME");
        System.out.println("1.Want to play with friend");
        System.out.println("2.Want to play with AI");
        System.out.println("3.Exit");
        System.out.println("Enter your choice");
        int ip;
        Scanner s = new Scanner(System.in);
        ip = s.nextInt();
        if(ip == 1)
        {
            System.out.println("Enter Player1 name");
            Scanner n1 = new Scanner(System.in);
            String name1 = n1.nextLine();

            System.out.println("Enter Player2 name");
            Scanner n2 = new Scanner(System.in);
            String name2 = n2.nextLine();

            HumanPlayer p1 = new HumanPlayer(name1,'X');
            HumanPlayer p2 = new HumanPlayer(name2,'O');
            Player cp;
            cp = p1;
            while(true)
            {
                System.out.println(cp.name + " Turn");
                cp.makeMove();

                TicTacToe.dispBoard();

                if(TicTacToe.checkColWin() || TicTacToe.checkRowWin()
|| TicTacToe.checkDiagWin())
                {
                    System.out.println(cp.name +" Has Won");
```

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```
                break;
            }
            else if(TicTacToe.checkDraw())
            {
                System.out.println("Game is draw");
                break;
            }
            else
            {
                if(cp == p1)
                {
                    cp = p2;
                }
                else
                {
                    cp = p1;
                }
            }
        }
    }
}

else if(ip == 2)
{
    System.out.println("Enter Your name");
    Scanner n1 = new Scanner(System.in);
    String name1 = n1.nextLine();

    HumanPlayer p1 = new HumanPlayer(name1, 'X');
    AIPlayer p2 = new AIPlayer("AI", 'O');
    Player cp;
    cp = p1;
    while(true)
    {

        System.out.println(cp.name + " Turn");
        cp.makeMove();

        TicTacToe.dispBoard();

        if(TicTacToe.checkColWin() || TicTacToe.checkRowWin() ||
TicTacToe.checkDiagWin())
        {
            System.out.println(cp.name + " Has Won");
            break;
        }
        else if(TicTacToe.checkDraw())
        {
```

TIC TAC TOE GAME IN JAVA

```
        System.out.println("Game is draw");
        break;
    }
    else
    {
        if(cp == p1)
        {
            cp = p2;
        }
        else
        {
            cp = p1;
        }
    }
}

else if(ip == 3)
{
    System.out.println("Your are leaving");
}
else
{
    System.out.println("Enter only 1 , 2 or 3");
}

}
}
```

TIC TAC TOE GAME IN JAVA

OUTPUT 1: Playing with a friend

The screenshot displays a Java IDE with a terminal window showing the execution of a Tic Tac Toe game. The game is played between two players, Yashu and Madu. The terminal output shows the game progress, including player names, turns, and the board state. The game ends with Madu winning.

```
PS C:\Users\Yashu H M\Desktop\JAVA Programming> javac LaunchGame.java
PS C:\Users\Yashu H M\Desktop\JAVA Programming> java LaunchGame
Hi, WELCOME TO TIC TAC TOE GAME
1.Want to play with friend
2.Want to play with AI
3.Exit
Enter your choice
1
Enter Player1 name
Yashu
Enter Player2 name
Madu
Yashu Turn
Enter the row and col
1 2
-----
| | | |
| | |X|
| | | |
| | | |
-----
Madu Turn
Enter the row and col
2 2
-----
| | | |
| | |X|
| | |O|
| | | |
-----
Yashu Turn
Enter the row and col
0 1
-----
| |X| |
| | |X|
| | |O|
| | | |
-----
Madu Turn
Enter the row and col
-----
Yashu Turn
Enter the row and col
0 1
-----
| |X| |
| | |X|
| | |O|
| | | |
-----
Madu Turn
Enter the row and col
1 2
Enter the row and col
2 1
-----
| |X| |
| | |X|
| |O|O|
| | | |
-----
Yashu Turn
Enter the row and col
1 1
-----
| |X| |
| |X|X|
| |O|O|
| | | |
-----
Madu Turn
Enter the row and col
2 0
-----
| |X| |
| |X|X|
|O|O|O|
| | | |
-----
Madu Has Won
PS C:\Users\Yashu H M\Desktop\JAVA Programming>
```

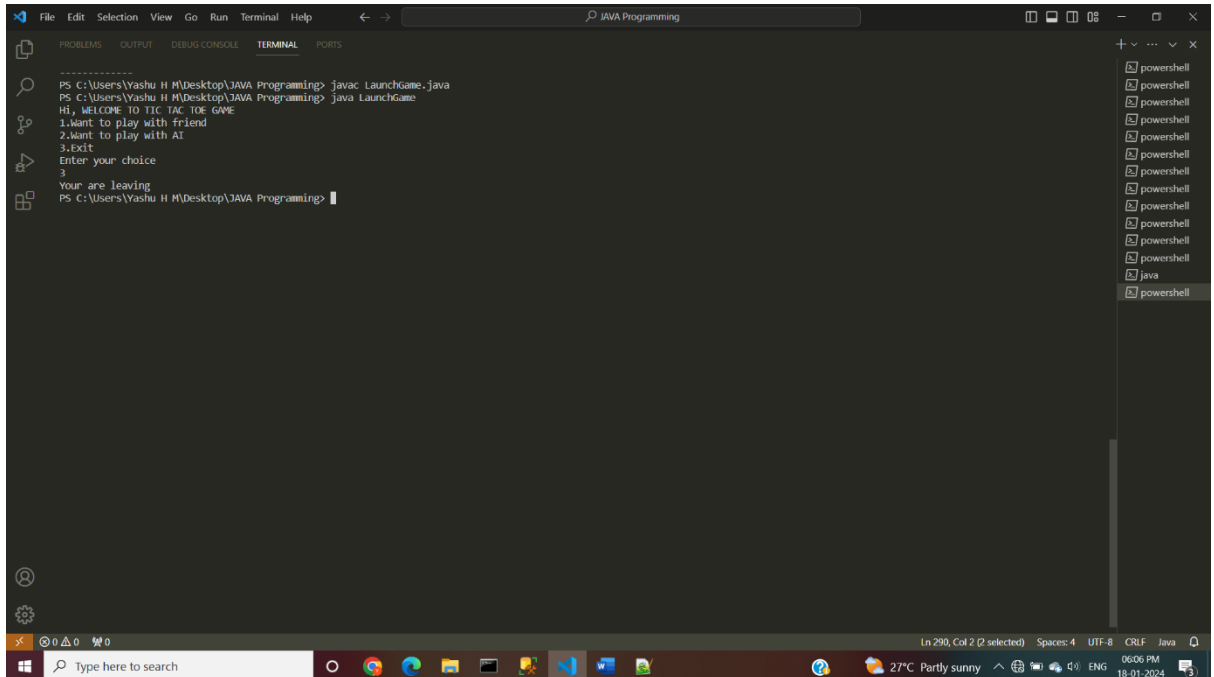
TIC TAC TOE GAME IN JAVA

OUTPUT 2: Playing with a AI

```
File Edit Selection View Go Run Terminal Help
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
2.Want to play with AI
3.Exit
Enter your choice
2
Enter Your name
Yashu
Yashu Turn
Enter the row and col
1 1
-----
| | | |
| | X | |
| | | |
-----
AI Turn
-----
| | | |
| | X | |
| | O | |
-----
Yashu Turn
Enter the row and col
2 0
-----
| | | |
| | X | |
| X | O | |
-----
AI Turn
-----
| | | |
| | X | |
| X | O | O |
-----
Yashu Turn
Enter the row and col
1 0
-----
| | | |
| X | X | |
| X | O | O |
-----
AI Turn
-----
| | | O |
| X | X | |
| X | O | O |
-----
Yashu Turn
Enter the row and col
1 2
-----
| | | O |
| X | X | X |
| X | O | O |
-----
Yashu Has Won
```

TIC TAC TOE GAME IN JAVA

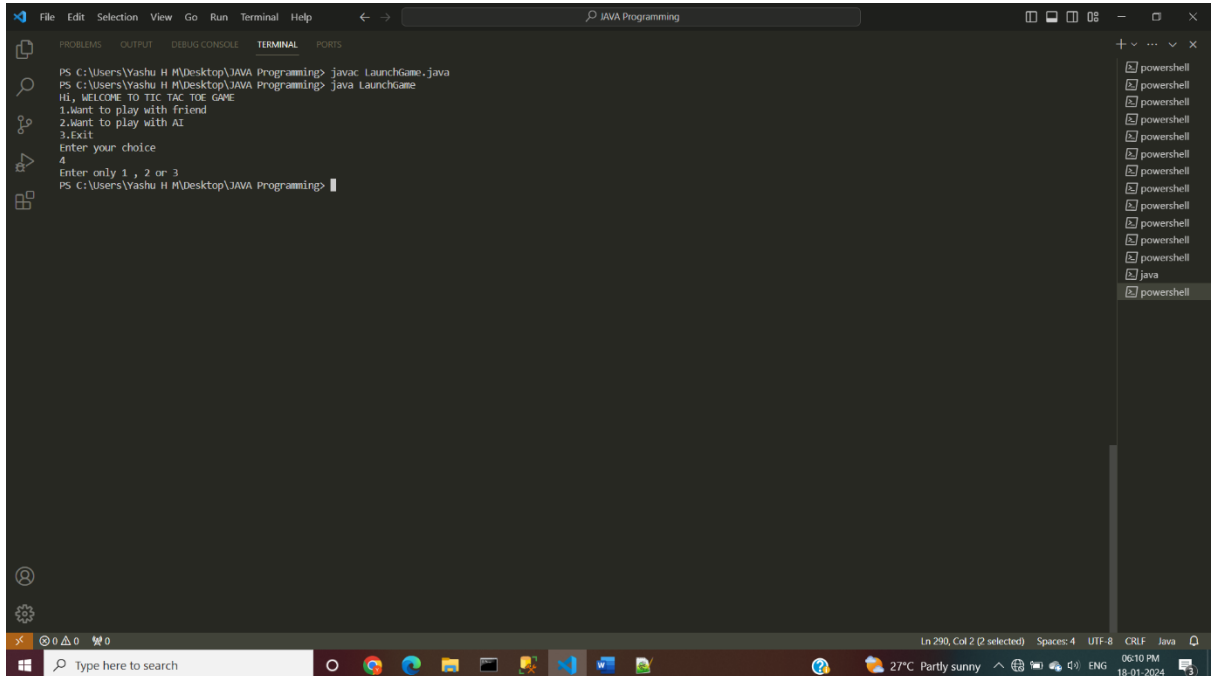
OUTPUT 3: Exiting



```
PS C:\Users\Yashu H M\Desktop\JAVA Programming> javac LaunchGame.java
PS C:\Users\Yashu H M\Desktop\JAVA Programming> java LaunchGame
HI, WELCOME TO TIC TAC TOE GAME
1.Want to play with friend
2.Want to play with AI
3.Exit
Enter your choice
3
You are leaving
PS C:\Users\Yashu H M\Desktop\JAVA Programming>
```

The screenshot shows a Java IDE with a terminal window. The terminal output displays the game's exit sequence. The user has entered '3' to exit the game. The IDE interface includes a menu bar (File, Edit, Selection, View, Go, Run, Terminal, Help), a toolbar, and a sidebar with icons for Explorer, Search, Run and Debug, and Source Control. The status bar at the bottom shows the current line and column (Ln 290, Col 2), the number of spaces (4), the encoding (UTF-8), and the file type (CRLF, Java). The Windows taskbar is visible at the bottom, showing the search bar and various system icons.

OUTPUT 4: Wrong choice



```
PS C:\Users\Yashu H M\Desktop\JAVA Programming> javac LaunchGame.java
PS C:\Users\Yashu H M\Desktop\JAVA Programming> java LaunchGame
HI, WELCOME TO TIC TAC TOE GAME
1.Want to play with friend
2.Want to play with AI
3.Exit
Enter your choice
4
Enter only 1 , 2 or 3
PS C:\Users\Yashu H M\Desktop\JAVA Programming>
```

The screenshot shows a Java IDE with a terminal window. The terminal output displays the game's response to an invalid choice. The user has entered '4', which is not a valid option. The game prompts the user to enter only 1, 2, or 3. The IDE interface is identical to the previous screenshot, showing the menu bar, toolbar, sidebar, and status bar. The Windows taskbar is also visible at the bottom.

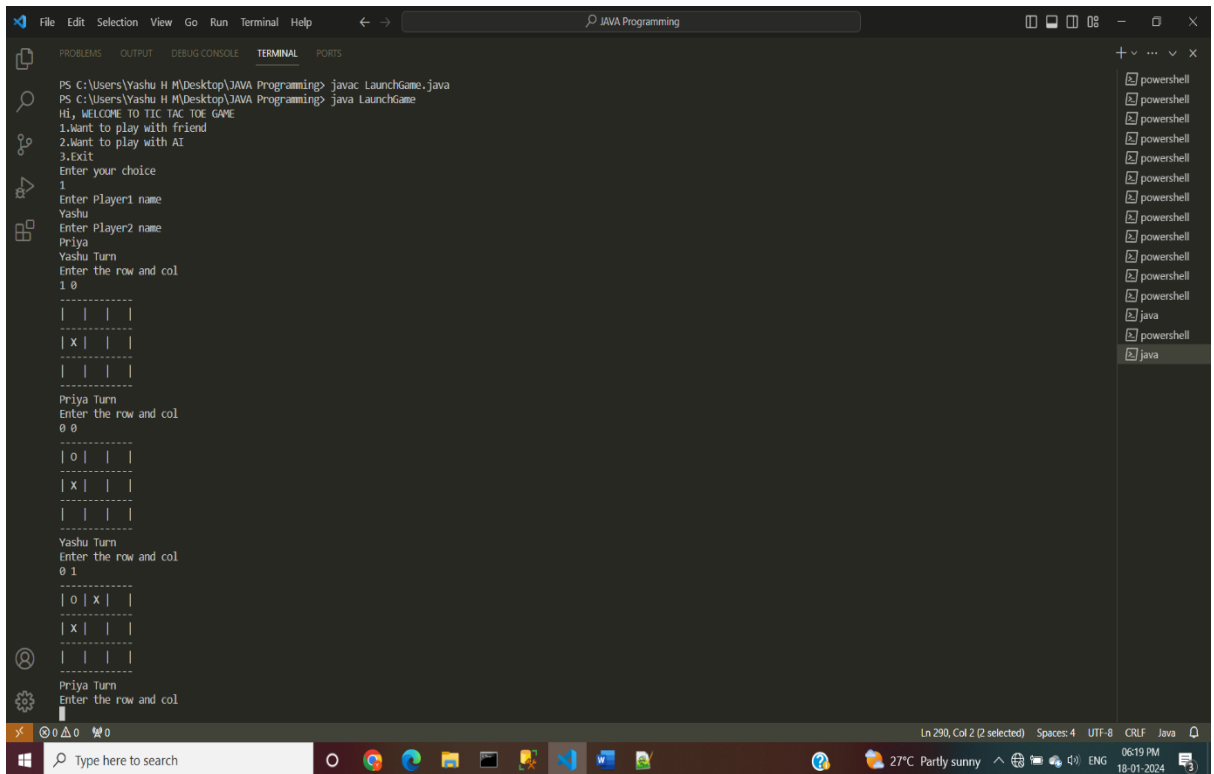
TIC TAC TOE GAME IN JAVA

OUTPUT 5: Draw case

```
-----
| o | | |
-----
Priya Turn
Enter the row and col
2 1
-----
| o | x | |
-----
| x | x | |
-----
| o | o | |
-----
Yashu Turn
Enter the row and col
0 2
-----
| o | x | x |
-----
| x | x | |
-----
| o | o | |
-----
Priya Turn
Enter the row and col
1 2
-----
| o | x | x |
-----
| x | x | o |
-----
| o | o | |
-----
Yashu Turn
Enter the row and col
2 2
-----
| o | x | x |
-----
| x | x | o |
-----
| o | o | x |
-----
Game is draw
PS C:\Users\Yashu H M\Desktop\JAVA Programming>
```

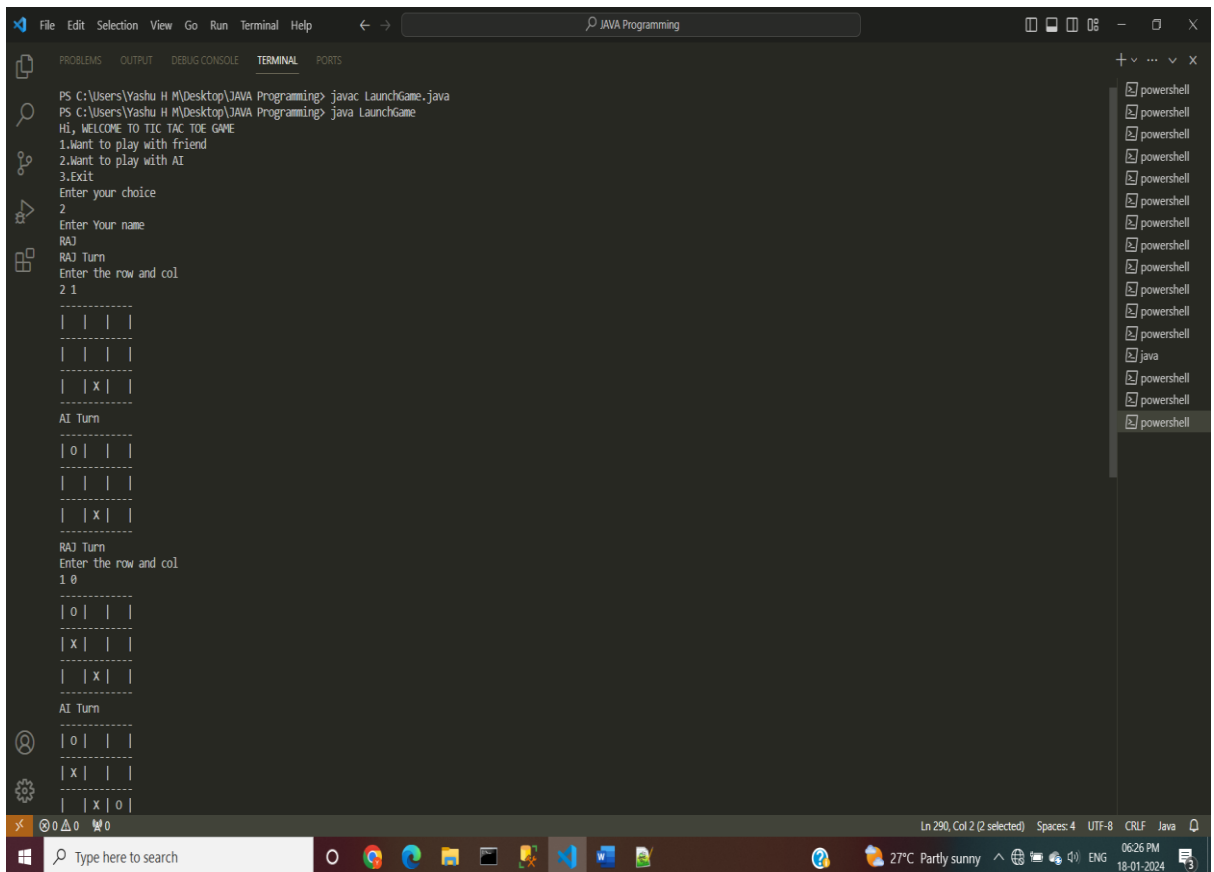
The screenshot shows a Java IDE with a terminal window. The terminal displays the game board and player moves. The game ends in a draw after 9 moves. The game board is a 3x3 grid. The players are Priya and Yashu. The game is a draw.

TIC TAC TOE GAME IN JAVA



```
PS C:\Users\Yashu H M\Desktop\JAVA Programming> javac LaunchGame.java
PS C:\Users\Yashu H M\Desktop\JAVA Programming> java LaunchGame
Hi, WELCOME TO TIC TAC TOE GAME
1.Want to play with friend
2.Want to play with AI
3.Exit
Enter your choice
1
Enter Player1 name
Yashu
Enter Player2 name
Priya
Yashu Turn
Enter the row and col
1 0
| | |
| x | |
| | |
-----
Priya Turn
Enter the row and col
0 0
| o | |
| x | |
| | |
-----
Yashu Turn
Enter the row and col
0 1
| o | x |
| x | |
| | |
-----
Priya Turn
Enter the row and col
```

OUTPUT 6: AI Won



```
PS C:\Users\Yashu H M\Desktop\JAVA Programming> javac LaunchGame.java
PS C:\Users\Yashu H M\Desktop\JAVA Programming> java LaunchGame
Hi, WELCOME TO TIC TAC TOE GAME
1.Want to play with friend
2.Want to play with AI
3.Exit
Enter your choice
2
Enter Your name
RAJ
RAJ Turn
Enter the row and col
2 1
| | |
| | |
| x | |
-----
AI Turn
| o | |
| | |
| | |
-----
RAJ Turn
Enter the row and col
1 0
| o | |
| x | |
| | x |
-----
AI Turn
| o | |
| x | |
| | x o |
-----
```

TIC TAC TOE GAME IN JAVA

```
File Edit Selection View Go Run Terminal Help
JAVA Programming

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

-----
| O | | |
| X | | |
| | X | O |
-----
RAJ Turn
Enter the row and col
0 2
-----
| O | | X |
| X | | |
| | X | O |
-----
AI Turn
-----
| O | O | X |
| X | | |
| | X | O |
-----
RAJ Turn
Enter the row and col
2 0
-----
| O | O | X |
| X | | |
| X | X | O |
-----
AI Turn
-----
| O | O | X |
| X | O | |
| X | X | O |
-----
AI Has Won
PS C:\Users\Yashu.H.M\Desktop\JAVA Programming>
```

Ln 290, Col 2 (2 selected) Spaces: 4 UTF-8 CRLF Java

Type here to search

27°C Partly sunny 06:26 PM 18-01-2024