*package tictactoe;*

*import java.util.Scanner;*

*import java.util.Random;*

*import java.util.List;*

*import java.util.ArrayList;*

*import java.util.Arrays;*

*public class TicTacToe {*

*//All the methods for operating the game smoothly are defined by the methods which are in this class:*

*static ArrayList<Integer> playerPositions= new ArrayList<Integer>(); //Creating an ArrayList for storing winning positions of the board for user inputs*

*static ArrayList<Integer> cpuPositions= new ArrayList<Integer>(); //Creating an ArrayList for storing winning positions of the board for CPU random entries*

*//Creating a function named PGameBoard()which prints the empty game board using nested for loop*

*public static void PGameBoard(char[][] gameBoard)*

*{*

*for(char[] row:gameBoard){*

*for(char c:row)*

*{*

*System.out.print(c);*

*}*

*System.out.println();}*

*}*

*//Creating a function named Placement() which places the symbol(O or X) on the desired position of game board and also switch between user and CPU turn*

*public static void Placement(char [][] gameBoard,int pos,String user)*

*{*

*//switching between user and CPU turns and also adding the occupied places of board to the ArrayList to help identify the winner*

*char symbol=' ';*

*if(user.equals("Player")){*

*symbol='X';*

*playerPositions.add(pos);}*

*else if(user.equals("CPU")){*

*symbol='O';*

*cpuPositions.add(pos);}*

*//putting the placement on gameBoard by using switch case:*

*switch(pos){*

*case 1:*

*gameBoard[0][0]=symbol;*

*break;*

*case 2:*

*gameBoard[0][2]=symbol;*

*break;*

*case 3:*

*gameBoard[0][4]=symbol;*

*break;*

*case 4:*

*gameBoard[2][0]=symbol;*

*break;*

*case 5:*

*gameBoard[2][2]=symbol;*

*break;*

*case 6:*

*gameBoard[2][4]=symbol;*

*break;*

*case 7:*

*gameBoard[4][0]=symbol;*

*break;*

*case 8:*

*gameBoard[4][2]=symbol;*

*break;*

*case 9:*

*gameBoard[4][4]=symbol;*

*break;*

*default:*

*break;}*

*}*

*// Creating a function which will check if there is a winner or a tie using lists,List of lists and Array lists*

*public static String CheckWin()*

*{*

*//Each of the following list shows the winning coonditions of board filling*

*List topR=Arrays.asList(1,2,3);*

*List midR=Arrays.asList(4,5,6);*

*List endR=Arrays.asList(7,8,9);*

*List topC=Arrays.asList(1,4,7);*

*List midC=Arrays.asList(2,5,8);*

*List endC=Arrays.asList(3,6,9);*

*List cross1=Arrays.asList(1,5,9);*

*List cross2=Arrays.asList(7,5,3);*

*//adding all those lists to a single list of list so that the operation will be easier*

*List<List> winning=new ArrayList<List>();*

*winning.add(topR);*

*winning.add(midR);*

*winning.add(endR);*

*winning.add(topC);*

*winning.add(midC);*

*winning.add(endC);*

*winning.add(cross1);*

*winning.add(cross2);*

*//checking the winner or tie*

*for(List l: winning){*

*if(playerPositions.containsAll(l)){*

*return "Congratulations!! You Won...";}*

*else if(cpuPositions.containsAll(l)){*

*return "Sorry!! CPU Won...";}*

*else if(playerPositions.size()+cpuPositions.size()==9){*

*return "A tie...";}}*

*return "";*

*}*

*//Creating main function which calls all the ablove functions,creates an empty game board, takes user input and print the results*

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

*{*

*//initializing a 2D array for creating an empty game board*

*char[][] gameBoard= {{' ','|',' ','|',' '},*

*{'-','+','-','+','-'},*

*{' ','|',' ','|',' '},*

*{'-','+','-','+','-'},*

*{' ','|',' ','|',' '}};*

*PGameBoard(gameBoard);//calling the function to print(create) the game board*

*//taking input of user placement and also allowing CPU to randomly put its symbol 'O':*

*while(true)*

*{*

*Scanner scan=new Scanner(System.in);*

*System.out.println("enter your placement(1-9): ");*

*int playerPos=scan.nextInt(); //user input for placement*

*while(playerPositions.contains(playerPos)||cpuPositions.contains(playerPos)) {*

*System.out.println("Place occupied!! choose the correct position.");*

*playerPos=scan.nextInt(); }*

*Placement(gameBoard,playerPos,"Player"); //calling the function to put the symbol of player on game board according to the input position*

*String result=CheckWin();*

*if(result.length()>0){*

*System.out.println("--------------------------\n"+result+"\n--------------------------");*

*break;}*

*Random rand=new Random(); //random CPU input for placement*

*int CPUpos=rand.nextInt(9)+1;*

*while(playerPositions.contains(CPUpos)||cpuPositions.contains(CPUpos)){*

*CPUpos=rand.nextInt(9)+1;}*

*Placement(gameBoard,CPUpos,"CPU");//calling the function to put the symbol of CPU on game board according to the random function position*

*PGameBoard(gameBoard);*

*result=CheckWin();*

*if(result.length()>0){ //checking whether there is a winner*

*System.out.println("--------------------------\n"+result+"\n--------------------------");*

*break;}*

*}}*

*}*