MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Skills Based Mini Project Report

on

Tic Tae Toe Game

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(Professor)

Submitted to:

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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CERTIFICATE

This is certified that **Akash Sharma**(0901CA211003) has submitted the project report titled on the **Tic Tac Toe Game in Java** under the mentorship of **Dr. Anshu Chaturvedi (**Professor) as requirement of skill based mini project.

Dr. Anshu Chaturvedi
(Professor)
Computer science and engineering

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DECLARATION

I hereby declare that the work being presented in this project report, for the partial fulfilment of requirement for the award of the degree of Master of Computer Application in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship **of Dr.Anshu Chaturvedi**, (Professor), MITS Gwalior

I declare that I have not submitted the matter embodied in this report for the award o anywhere else.

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ABSTRACT

The game of Tic-tac-toe is one of the most commonly known games. This game does not allow one to win all the time and a significant proportion of games played results in a draw. Thus, the best a player can hope is to not lose the game. This study is aimed at evolving a numberof no-loss strategies using genetic algorithms and comparing them with existing methodologies.To efficiently evolve no-loss strategies, we have developed innovative ways of representing and evaluating a solution, initializing the GA population, developing GA operators including an elite preserving scheme. Interestingly, our GA implementation isable to find more than !" thousand no-loss strategies for playing the game. #moreover, an analysis of these solutions has given us insights about how to play the game to not lose it. $askedon this experience, we have developed specialized efficient strategies having a high win-to-draw ratio. The study and its results are interesting and can be encouraging for the techniques tobe applied to other board games for finding efficient strategies

Contents

Introduction

Our project name is Tic-Tac -Toe game. This game is very popular and is fairly simple by itself. It is actually a two player game. on this game, there is a board with *n* x *n* squares. on our game,it is 3 x 3 squares. The goal of Tic-Tac-Toe is to be one of the players to get three same symbols in a row - horizontally, vertically or diagonally - on a 3 x 3 grid.

By playing games, the machine intelligence can be revealed. For knowledge-based methods, the best move is determined by searching a game tree. For games such as checkers, the tree spanning is very large. Tree searching will be time consuming even for a few plies. 4ence, an efficient searching algorithm is an important issue. The problems aresolved by forming a possible set of solutions based on the endgame condition, or searching for the set of solutions based on the current game condition. The machine cannot learn to play the games by itself. Unlike an evolutionary approach was employed to evolve and to learn for playing Tic-Tac-Toe without the need of a database. Artificial intelligence (AI) the intelligence of machines and the branch of computer science that aims to create it. Tic-tac-toe isa pencil-and-paper game for two players, 7 and, who take turns marking the spaces in a 3x3 grid

OBJECTIVE

Our objective is to evolve several Tic-tac-toe strategies which never lose 5meaning a draw or a win by the computer6. This makes the problem to have a single objective of minimizing the number of losses. The evaluation of fitness of any strategy is done by first allowing it to play all possible games it could play, both as a first player and as a second player. 3or example, note from 3igure 9 that there are two possible ways game can move for the first player from level &to level ", depending on whether the opponent made the left or the right side move.Our evaluation procedure considers all such intermediate

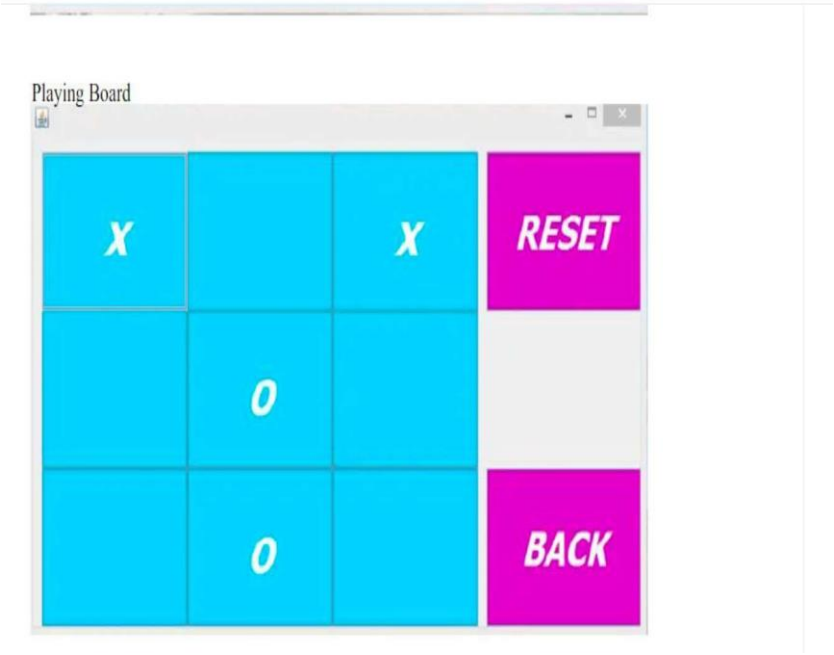
Our possibilities an opponent can have and count the total number of possible games resulting in wins, draws and losses. This is continued for the above strategy to be played as the second player. The total number of games lost in both cases as a first player and second player is calculated.

OUTPUT

Main Window

Empty Board

Playing Game



CODE

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class TTT1 extends JFrame implements ItemListener, ActionListener{
int i,j,ii,jj,x,y,yesnull;
int a[][]={{10,1,2,3,11},{10,1,4,7,11},{10,1,5,9,11},{10,2,5,8,11},
            {10,3,5,7,11},{10,3,6,9,11},{10,4,5,6,11},
      {10,7,8,9,11} };
int a1[][]={{10,1,2,3,11},{10,1,4,7,11},{10,1,5,9,11},{10,2,5,8,11},
            {10,3,5,7,11},{10,3,6,9,11},{10,4,5,6,11},{10,7,8,9,11} };

boolean state,type,set;

Icon ic1,ic2,icon,ic11,ic22;
Checkbox c1,c2;
JLabel l1,l2;
JButton b[]=new JButton[9];
JButton reset;

public void showButton(){

x=10; y=10;j=0;
for(i=0;i<=8;i++,x+=100,j++){
```

```
 b[i]=new JButton();
if(j==3)
{j=0; y+=100; x=10;}
 b[i].setBounds(x,y,100,100);
add(b[i]);
b[i].addActionListener(this);
}//eof for

reset=new JButton("RESET");
reset.setBounds(100,350,100,50);
add(reset);
reset.addActionListener(this);

}//eof showButton

/*************************************************************/
public  void check(int num1){
for(ii=0;ii<=7;ii++){
  for(jj=1;jj<=3;jj++){
     if(a[ii][jj]==num1){ a[ii][4]=11;  }

  }//eof for jj

}//eof for ii
}//eof check
```

```
public void complogic(int num){

 for(i=0;i<=7;i++){
  for(j=1;j<=3;j++){
    if(a[i][j]==num){  a[i][0]=11; a[i][4]=10;   }
    }
 }
  for(i=0;i<=7;i++){            // for 1
   set=true;
  if(a[i][4]==10){             //if 1
     int count=0;
     for(j=1;j<=3;j++){        //for 2
        if(b[(a[i][j]-1)].getIcon()!=null){ //if 2
          count++;
           }                   //eof if 2
         else{ yesnull=a[i][j]; }
     }                         //eof for 2
    if(count==2){                //if 2
      b[yesnull-1].setIcon(ic2);
      this.check(yesnull); set=false;break;
      }                          //eof if 2
    }                            //eof if 1
    else
    if(a[i][0]==10){
          for(j=1;j<=3;j++){       //for2
```

```
 Icon icon3=b[(a[i][3]-1)].getIcon();
   if((icon1==icon2)&&(icon2==icon3)&&(icon1!=null)){
           if(icon1==ic1){
             b[(a[i][1]-1)].setIcon(ic11);
             b[(a[i][2]-1)].setIcon(ic11);
             b[(a[i][3]-1)].setIcon(ic11);
  JOptionPane.showMessageDialog(TTT1.this,"!!!YOU won!!! click reset");
      break;
              }
         else if(icon1==ic2){
         b[(a[i][1]-1)].setIcon(ic22);
         b[(a[i][2]-1)].setIcon(ic22);
         b[(a[i][3]-1)].setIcon(ic22);
          JOptionPane.showMessageDialog(TTT1.this,"won! click reset");
           break;
         }
      }
  }


}//eof actionperformed
/*************************************************************/

public static void main(String []args){
new TTT1();
```

Conclusion

I have done my best to make the complicated process of "**TIC TAC TOE GAME"** as simple as possible using structured & modular technique menu oriented interface. have tried to design the software in such a way that user may not have any difficulty in using this packageL further expansion i s possible without much effort. 1 ven though I cannot claim that this work to be entirely exhaustive. As every game has some limitationsso my project is not exceptional, but ,will try to short out them very shortly and deliver a defective less product to client. I am confident that this software package can be readily used by non-programming personal avoiding human handled chance of error.

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