EAST WEST UNIVERSITY

Submitted to

Redwan Ahmed Rizvee

Lecturer

Department of Computer Science and Engineering

Submitted by

Tanvir Mobasshir

ID: 2019-2-60-025

Section: 2

Zareen Tasnim Nishat

ID: 2019-2-60-013

Section: 2

1. Problem Statement:

In this problem It has been asked to implement the Minimax algorithm with Alpha-Beta Pruning to solve the Tic-Tac-Toe Problem.

2. Solution Approach

Initial Steps:

- Took necessary user input as player max (X) and min (O)

Data Structures: To resolve this issue, we will need:

- A 2D matrix for puzzle state storage.

Algorithm:

The major goal is to prevent nodes from expanding that don't provide any useful value. Steps are:

- Pass the current state to the alpha beta pruning function.
- Depending on the player, call the min value or max value function inside the function.
- Create the successor nodes in each function and pass them to the alternative function.
- Determine whether the utility value that each function returns has an effect on the alpha or beta value. If so, either modify the value or prune the node.
- Return the state after reaching the terminal node.

Tested input and output:

Test 1

```
Board =
x _ _
_ o x
o _ _
Player = Min
Winner is Min
Next board can be,
x o _
_ o x
o _ _
```

Test 2

```
Board =
x _ _
_ o x
o _ _
Player = Max
Winner is Max
Next board can be,
x _ x
_ o x
o _ _
```

Test 3

```
Board =
x _ x
_ o _
o _ _
Player = Min
Draw
```