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**Faculty of Informatics and Computer Science**

**Logic and Artificial Intelligence**

Tic tac toe game

A project proposal for the Logic and Artificial Intelligence

***Presented by***

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**Background information:**

Tic tac toe was played in the Roman empire, it’s a simple game which is played by two players. It consists Xs and Os. It’s played in a 3x3 grid, the player who is playing “X” always goes first, then the second player do the “O”. The first player that has three is row, horizontally, vertically or diagonally is the winner.

**The problem:**

The problem appeared when the developers wanted to make a tic-tac-toe game unbeatable, and the worst-case scenario is a draw.

**Language:**

The language I am using is Python as python is a leader in Artificial intelligence projects and it’s much easy to use its libraries as it can help more than any other programming language.

**Libraries:**

I used many libraries to help me to do design this agent, they are math to use infinity numbers, random to choose choice, time to delay some time, tkinter to do the GUI.

**Platform:**

The platform is 3x3 grid appears in the console.

**How to play:**

The player chooses whether to start playing or not, if yes then the computer is initialized as the second person automatically. The game is played with number pad, the player chooses the cell number by choosing the number on the number pad, Then the agents chooses the location of his cell by using specific algorithm. The first person completes 3 cells with his sign either diagonal, vertical or horizontal is the winner.

**Algorithm:**

The algorithm I used is Minimax Algorithm as the agent is trying to maximize his score.

**Helper functions:**

I’ve been using many helper functions to help me to play the game and initialize the location of the cells. Like Win, win helps me to determine whether I’ve got the player/AI agent in 3 cells diagonally, vertically or horizontally. Game over function, it helps to determine whether I’ve got a winner and ends the game. Empty cells function determines which cells are empty to view for the user to choose. Valid move function determines whether the player’s move is valid and inside the grid and empty or not. Print board function to print the grid.

**References:**

<https://www.youtube.com/watch?v=cGN6LfnOPeo>

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