****

**Name: Mahlika**

**Roll: Su92BSAIM059**

**Task: Tic-Tac-Toe**

**Sir: Rasikh Ali**

**AI LAB TASK :1**

**Introduction of Tic Tac Toe:**

This project is a **Tic-Tac-Toe** game, developed in Python using the Tkinter library. The game is designed for two players, where one plays with “X” and the other with “O”. Players take turns to place their marks on a 3x3 grid. The program automatically checks for a winning line and announces the result. If someone wins, the winning row, column, or diagonal is highlighted, and the game ends immediately.

**How the Game Works:**

**Game Layout**

The game window contains a **3x3 grid of buttons**, each representing a space on the board. Players simply click on these buttons to make their move. A label below the grid shows whose turn it is, making the game easy to follow.

**Player Turns**

The game always begins with **Player X**. After each move, the program automatically changes the turn to the other player. The label updates every time so both players know who should play next.

**Winner Checking**

After every move, the program looks at all possible winning patterns. A player wins if they manage to place three of the same marks in a row, column, or diagonal. When a winning condition is found, the winning line is highlighted in green, and a message box appears to declare the winner.

### Game End

Once a winner is announced, the game stops right away. This prevents any more moves from being made after the result.

### User Interaction

* Players use mouse clicks to place their mark.
* Only empty cells can be selected.
* Once a cell is filled, it cannot be changed.
* A clear pop-up message tells the result of the game.

## Functions Used

The program makes use of a few simple functions to control the flow of the game. **check\_winner()** is used to scan the board after every move and decide if a player has won. **button\_click()** manages what happens when a button is pressed, making sure the cell is empty before marking it. **toggle\_player()** switches turns between Player X and Player O and updates the label to guide players. These small functions together make the game smooth and easy to play.

## Features

* Clean and user-friendly interface.
* Interactive 3x3 grid for the game board.
* Automatic turn changing between players.
* Built-in checking system for all winning conditions.
* Winning line highlighted for better visibility.
* Message box to clearly announce the winner.

## Problems Faced

When I was writing the code, I had some small problems. First, the turns were not changing properly because I forgot to update the player. I fixed it after checking the code again. I faced issues like wrong spacing or small syntax errors, which I corrected by running the code step by step. Another problem was that the winner message was showing many times. I solved this by stopping the game after one player won. In the beginning, I had faced difficulty making the buttons in a 3x3 grid, but then I used the grid layout and it worked.