Project Report

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1. Introduction

Tic-Tac-Toe is a classic two-player strategy game played on a 3×3 grid. Players take turns marking spaces with either **X** or **O**, and the first player to align three marks in a row, column, or diagonal wins.
This project demonstrates the use of **Python programming**, **loops**, **functions**, **condition checking**, and **user input handling** through a console-based implementation of Tic-Tac-Toe.

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2. Objectives

The main objectives of this project are:

- To implement a console-based Tic-Tac-Toe game in Python.
- To apply concepts such as lists, functions, loops, and conditional statements.
- To handle invalid user input gracefully.
- To determine game outcomes: **win**, **loss**, or **draw.**

- To explore simple game logic and user interaction.

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3. System Requirements

Hardware Requirements

- Any computer capable of running Python

Software Requirements

- Python 3.x
- Code editor (VS Code, PyCharm, Notepad++, etc.)

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4. Methodology

The program uses a **list of 9 elements** to represent the Tic-Tac-Toe board.
Key components:

4.1 Board Representation

board = [" " for _ in range(9)]

Each index (0–8) corresponds to a cell.

4.2 Display Function

The show_board() function prints the current state of the board.

4.3 Winner Checking

The winner(player) function checks all 8 winning combinations:

- 3 rows
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3 columns

- 2 diagonals

4.4 Main Game Loop

- Ask player for input
- Validate input
- Update board
- Check win or draw
- Switch player turn

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5. Code Implementation

(Include the code block from Section 1 in your report.)

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6. Output Screenshots (to be added by student)

You can add:

- Initial empty board
- A few moves
- Winner screen
- Draw screen

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7. Results & Discussion

The program successfully allows two players to play Tic-Tac-Toe in the terminal.
It validates the input and detects:

- Invalid entries
- Occupied positions
- Winning combinations
- Draw state

The modular structure makes the code easy to understand and improve.

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8. Conclusion

The project effectively implements a complete Tic-Tac-Toe game using Python. It demonstrates core programming concepts:

- List operations
- Function definitions

- Condition checking
- Loops
- User interaction

This project can be extended by adding features like:

- Computer AI opponent
- Graphical user interface
- Scoreboard tracking

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9. References

- Python Official Documentation

- Online Python Tutorials

- Game logic commonly used in Tic-Tac-Toe implementations