Tic-Tac-Toe Python Project Report

Introduction

This project is a simple, beginner-friendly implementation of the Tic-Tac-Toe game using Python. The purpose of this project is to help new programmers understand how basic Python concepts like lists, loops, functions, and conditionals can be combined to create a working game.

Project Overview

The Tic-Tac-Toe game is played between two players: Player X and Player O. Players take turns selecting positions on a 3×3 grid by entering numbers from 1 to 9. The game updates the grid after each move and checks if a player has won.

Core Concepts Used

1. Lists: The 3×3 board is stored in a list with 9 positions.
2. Functions: Used to print the board and check for winners.
3. Conditionals: Check valid moves, detect winners, and handle draws.
4. Loops: The game runs for a maximum of 9 turns unless someone wins earlier.

How the Game Works

The game begins with an empty board. Players alternate turns by selecting a numbered position. The program ensures the move is valid and updates the board. It then checks all possible winning combinations. If none match and the board fills up, the game ends in a draw.

Winning Logic

The game checks eight possible winning combinations:
- Three rows
- Three columns
- Two diagonals
If any three cells contain the same symbol (X or O), the player wins.

Conclusion

This Tic-Tac-Toe project demonstrates how simple programming concepts can be used to build a fully functional game. It is a great practice project for beginners and can be expanded with features like an AI opponent, GUI interface, or scoreboard.