# Tic-Tac-Toe Game Development Notes

## Project Overview

Created a classic Tic-Tac-Toe game using Python and Tkinter for the graphical interface. The game features two-player functionality with visual indicators for wins and ties.

## Key Components

1. Game Setup

* Initialized main game window (228x259 pixels)
* Set X as the starting player
* Implemented move counter to track turns

2. Game Logic

* Turn Management:
  + Alternates between X and O players
  + Tracks move with counter variable
* Win Detection:
  + Checks all 8 possible winning combinations (3 rows, 3 columns, 2 diagonals)
  + Highlights winning squares in red
  + Displays winner message
* Tie Detection:
  + Triggers when board is full (9 moves) with no winner
  + Shows tie notification

3. User Interface:

* Game Board:
  + 3x3 grid of interactive buttons
  + Clear visual distinction between X and O moves
* Menu System:
  + Options menu with "Reset Game" functionality
* Feedback:
  + Error messages for invalid moves
  + Win/tie notifications

4. Technical Implementation:

- Used Tkinter for GUI components

- Implemented event-driven programming for button clicks

- Utilized global variables for game state tracking

- Applied grid layout for button arrangement

## Code Structure

1. Initialization (window setup, variables)

2. Core functions (win checking, button handling)

3. UI components (buttons, menu)

4. Main game loop

## Features

- Two-player turn-based gameplay

- Visual win indication (red highlighting)

- Game reset capability

- Clear win/tie notifications

- Input validation

## Development Notes

- Fixed initial issue with O win messages showing X

- Optimized reset function to modify rather than recreate buttons

- Added comprehensive win condition checking

- Implemented proper tie detection logic

## Usage Instructions

1. Launch the program

2. Players alternate clicking squares (X starts)

3. Game automatically detects wins/ties

4. Use "Reset Game" from Options menu to restart

## Files

- Single Python file containing all game logic and UI

- No external dependencies beyond Python standard library

## Potential Improvements

- Add tracking

- Implement AI opponent

- Enhance visual design

- Add game history feature

This document provides complete documentation of the Tic-Tac-Toe game implementation for future reference or sharing with collaborators.