# Tic-Tac-Toe Program Plan

Overall Concept:
- Player vs Computer format
- Computer makes calculated moves to win the game or at least make it a draw
- 3x3 game board
- Player can stop or reset the game at any moment
- Input is from JButton
- When the player puts their mark, Jbutton will disappear and be replaced by the player's move.
- Computer is equipped with multiple strategies that work with different outcomes
- Different levels of difficulty
    - Level 1: Computer makes moves completely randomly
    - Level 2: Computer makes relatively calculated moves(blocks other player to not allow them to win)
    - Level 3: Computer makes properly calculated moves to win

Model:
- Getters and setters
- Methods to find winner
    - If user or computer has three marks creating a straight line, boolean gameOver = true
    - Else: continue game
- Methods for deciding computer moves
    - Places mark to block player

View:
- Getters and setters
- Extends JPanel
- One main panel that uses a border layout
- Center panel
    - uses a grid layout (3x3)
    - Main game panel

- Each slot of the grid layout has a JButton
- Panel for state
    - Indicates player turn
    - Round number
    - Reset/Restart button
    - Button to return to main menu
- Panel for result
    - States whether player won or computer won or if game is still in progress
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- Methods:
    - layoutView()
        - Creates layout for main JPanel as well as sub-panels
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    - updateGUI()
        - Updates the entire view based on user choice
    - restart()
        - Updates the GUI and clears all changes made during game
        - Creates blank game board
        - Boolean gameOver = true

Controllers:
- ActionListeners and action performed method for all 9 JButtons/slots
    - If userTurn = true
        - If slotSelected = empty
            - Let user place their mark on selected slot
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When user runs code:
- Displayed with five options
    - Level 1:
        - Difficulty Level: Easy
        - Computer makes moves completely randomly
    - Level 2:
        - Difficulty Level: Medium

- Computer makes relatively well-calculated moves
- Keeps placing mark to block player
- Will most likely end up in a draw
- Level 3:
    - Difficulty Level: Hard
    - Computer makes properly calculated moves and tries to win
    - Player must complete their move in under 5 seconds, otherwise mark will be placed at random
- Player vs Player Mode:
    - If player wants to play against a friend or family member rather than the computer
- Exit
    - Closes window and resets interactions

- When an option is selected and the user has finished playing an entire round, they are given three options:
    - Play again
    - Return to main menu
    - Exit Game

Notes:
- Separate JPanels for Menu and Game

Pseudocode:
- Displayed with main menu

- If userChoice = exit
    - Close window and reset interactions
- Else
    - gameLayout()
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