

Task: Tic Tac Toe

Description

A simple implementation in Java (or in C, depending on the chosen language) of the classic Tic Tac Toe game is provided, playable in two-player mode on a 3x3 grid. Students are given the “tictactoe” project containing a basic implementation of the game. This version includes the grid structure, player input management, grid display, and win/draw detection.

To run it in Java, you can try executing the following commands in the terminal:

- `javac main.java`
- `java main`

No graphical interface is required.

To run it in C, you can try executing the following commands in the terminal:

- `gcc -o tris main.c tris.c`
- `./tris`

The following features are required to be added to the provided implementation:

1. **Creation of Game Menu:** Create a game menu containing the following items:
 - Start new game.
 - Change players' nicknames.
 - View game statistics.
 - Reset game data.
 - Exit.
2. **Move Validation:** Validate the input so that the program accepts only valid numerical values and provides appropriate error messages. If a player enters a non-numeric character, the program must display an error message and ask for input again. Additionally, two types of errors must be distinguished:
 - Invalid input (e.g., alphanumeric characters or values outside the 1-3 range).
 - Already occupied cell (when the player selects a position already used on the grid).In both cases, the program must provide a clear error message and ask the user to try again.
3. **Random Selection of First Player:** Implement a feature where the order of play is chosen randomly at the start of the game. A message must inform the players of the result: “The first player will be: [Name] with the symbol [X/O]”

4. **Timer for Game Duration:** Implement a timing system that measures the duration of each game. The timer should start when the first player makes their move and stop when the game ends. At the end of the game, the program should display the total time taken with a message (e.g.: “The game lasted 3 minutes and 42 seconds.”)
5. **Game Reset:** Reset game statistics data and restore the players’ nicknames to their default values.
6. **Display of Game Statistics:** Display a report showing the number of games played, the players’ scores, and the average duration of each game. The score is calculated by awarding 3 points for a win, 1 for a draw, and 0 for a loss. Furthermore, for each game played, the following details must be shown:
 - The game number.
 - The nickname of the player who won the game or “Draw” in case of a draw.
 - The total number of moves made by both players in the game.
 - The game duration.

Checklist for Evaluation

- ☐ Creation of game menu with the indicated items. (5%)
- ☐ Validation of move choice input. (10%)
- ☐ Random selection of initial player. (10%)
- ☐ Changing player names. (10%)
- ☐ Validation of player name input. (5%)
- ☐ Addition of game timer. (25%)
- ☐ Game reset. (10%)
- ☐ Display of game statistics. (25%)