

Unity Test Assignment

In this assignment we will implement a [Tic-Tac-Toe](#) game. This is a game for two players - X and - O, who take turns marking the spaces in a 3×3 grid. The player who succeeds in placing three of their marks in a horizontal, vertical, or diagonal row is the winner.

Part 1 - Tic Tac Toe

In this part we implement a basic “Tic Tac Toe” game.

Here are the basic game requirements, all the design decisions are up to you:

1. 3 x 3 grid size;
2. The game has 2 players, each will be assigned with X or O;
3. The players will take turns marking one empty square of the grid with their symbol - X goes first;
4. Time limit - each turn will have a time limit (default of 5 seconds). If a player is out of time he loses the game;
5. The game will end when one of the players will create a winning formation, a player runs out of time or the board is full;
6. Hint Button - Suggest a next valid move for the player (can be random)*;
7. Undo Button - Undo the previous round (computer and player last turn). Undo usages will be unlimited, and we will be able to undo back to the beginning of the game*;
8. Restart Game Button - restarts the game and randomly reassigns X/O to the players;
9. At the end of the game, a message will appear (“Player 1 wins”, “Player 2 wins” or “Draw”).

*Those features will be available only when playing against the computer.

The game should be implemented to support the following modes:

- Player 1 vs Player 2 (local multiplayer) - 2 players playing on the same device;
- Player vs Computer (Random valid move is enough).

The design should allow easy addition of new options (for example: play against an online player) without making modifications to the system design.

Part 2 - Unit Tests

Write unit tests that will cover the following:

- Hint
- Undo
- Win
- Lose
- Draw

Part 3 - Asset Bundles and Editor Tool

Creating Asset Bundles

Create an [EditorWindow](#) in which we can define and assign the following:

- X symbol (graphics)
- O symbol (graphics)
- Background (graphics)
- Asset bundle name (text)
- Build asset bundle (button)

Pressing the “build” button will trigger the creation of an [Asset Bundle](#) with all of the content assigned above and will save the asset bundle to the [Streaming Assets](#) folder.

Using Asset Bundles

The game should support loading an asset bundle which was created at the previous step and replacing the visual assets inside the game (at runtime, see part 4 - reskin).

Part 4 - Main Menu

The game should have a “Main Menu” with the following options:

1. Choose play mode (player1 vs player 2 / player vs computer);
2. “Start” button will start the tic tac toe game in the selected mode;
3. “Reskin” button + Text Box. When clicking reskin, try to load the asset bundle with the name from the text box and replace the game graphics (see part 3);

We supply you (in addition to this doc) with a basic asset (Unity package) to be able to create the game. The usage of the assets is a recommendation.

Possible Bonus Points

- Difficulties against the computer (easy/medium/hard);
- Animations (victory, time, etc.);
- Sounds (from any free sounds website);
- Settings screen that will control the game functionality;
- Support full screen (different screen sizes);
- Support computer vs. computer play mode.

Things to Consider

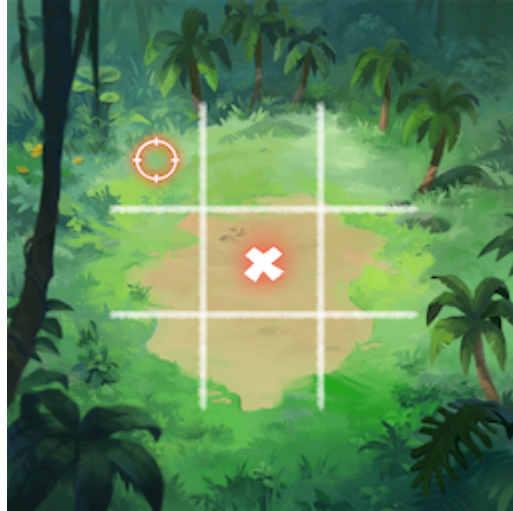
Pay attention to the performance characteristics of your solution:

- Execution time
- Memory usage (GC, boxing, etc)

Please Note:

The solution is expected to be designed using proper software engineering principles, and should be properly documented when needed (so we know what decisions were made, and why).

The solution should be implemented by using C# and Unity version 2019.4 LTS



What and how to Submit

A **Unity package** containing all the assets (scripts, assets, game scene) that are required to run the exercise.

Questions?

Feel free to contact us with any questions or clarifications.

Submit to:

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- client-home-exercise-Kyiv@moonactive.com

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