* **Functional requirement description:**

1. Start game:

To play a Tic Tac Toe game, the player needs to input a certain character to start the game.

1. Choose the number of players:

The Tic Tac Toe game provides both HumanPlayer and ComputerPlayer options. If there are two human players, then one of the players should enter 2 or else 1 to play against the computer.

1. Enter player’s name:

The players can input their names before playing the game.

1. Assign characters:

The game automatically assigns the characters ‘X’ and ‘O’ to each user.

1. Move:

Maximum 2 players play the game at a time with each taking turn.

1. Check Winner:

The first player to create one of the combinations (2 diagonals, 3 vertical, and 3 horizontals) with their respective character wins the game.

1. Show leaderboard:

The players can see their scores on the screen.

1. Restart game:

The game prompts whether to restart the game or end the game after the leaderboard is displayed.

1. End game:

The players can end the game whenever they want.

* **Nonfunctional requirement description:**

1. Usability:

The game provides a simple design and good layout that help players easily to play the game and achieve a defined goal effectively, efficiently, and satisfactorily.

1. Reliability:

The game is reliable as input validation will be used to check the user inputs allowing them to continue the game until and unless a valid input is entered without crashing the game.

* **Use Case Diagram:**

**Diagram

Description automatically generated**

* **Use Case Narrative:**

Firstly, the user is prompted to enter a certain character to start or exit the game. If the user (Player1) inputs the character to exit the game, the game ends, else the game starts. The game asks to choose from the number of players playing the game (either 1 or 2). 1 as input will be taken by the game as Player 1 vs Computer. 2 as input will allow 2 players (Player 1 and Player 2) to play the game against each other. The game asks the players to enter their names and then assigns the game characters (i.e. “X” or “O”) to each player. Then the game is played and the first player to get one of the combinations from the 8 combinations is declared the winner. Then the scoreboard is displayed on the screen and the player is prompted to input a certain character either to play again or to end the game.

* **UML Class Diagram:**

**A picture containing text, sign, screenshot

Description automatically generated**