TIC TAC TOE TO ENTERTAIN THE MARS CREW

UNIQUENESS:

- Two types of game modes: human v/s human and human v/s computer. (Game Mode)
- Human v/s Human has options to choose symbol(X/O) for the first player. (Symbol)
- Human v/s Computer has options to choose the game level from easy/intermediate/hard. (Game Level)
- Human v/s Computer has options to choose for the first player to be human or computer. (Starting Player)
- And then, it can choose for the symbol for the first player. (Symbol)
- For a given set of initial game choices there can be many number of games and the score is displayed for both the players according to their symbols. (Scoreboard)
- Hints are provided for the hard level in case of human v/s computer mode.(Recommendations)
- Magic Square Method used for medium level game mode.

BACK-END LANGUAGE: Java.

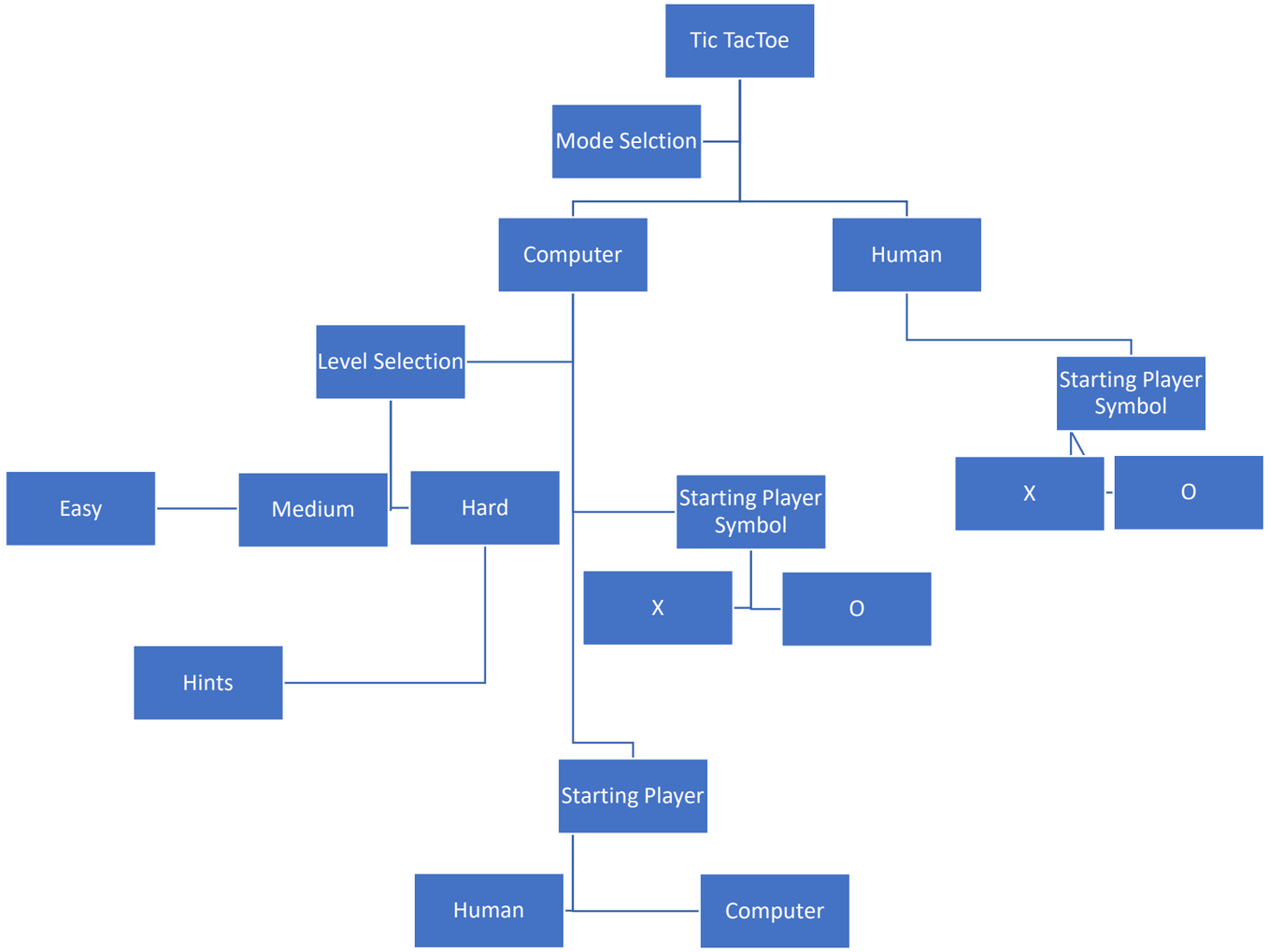
FRONT-END LANGUAGE: CSS, HTML.

IMPLEMENTATION:

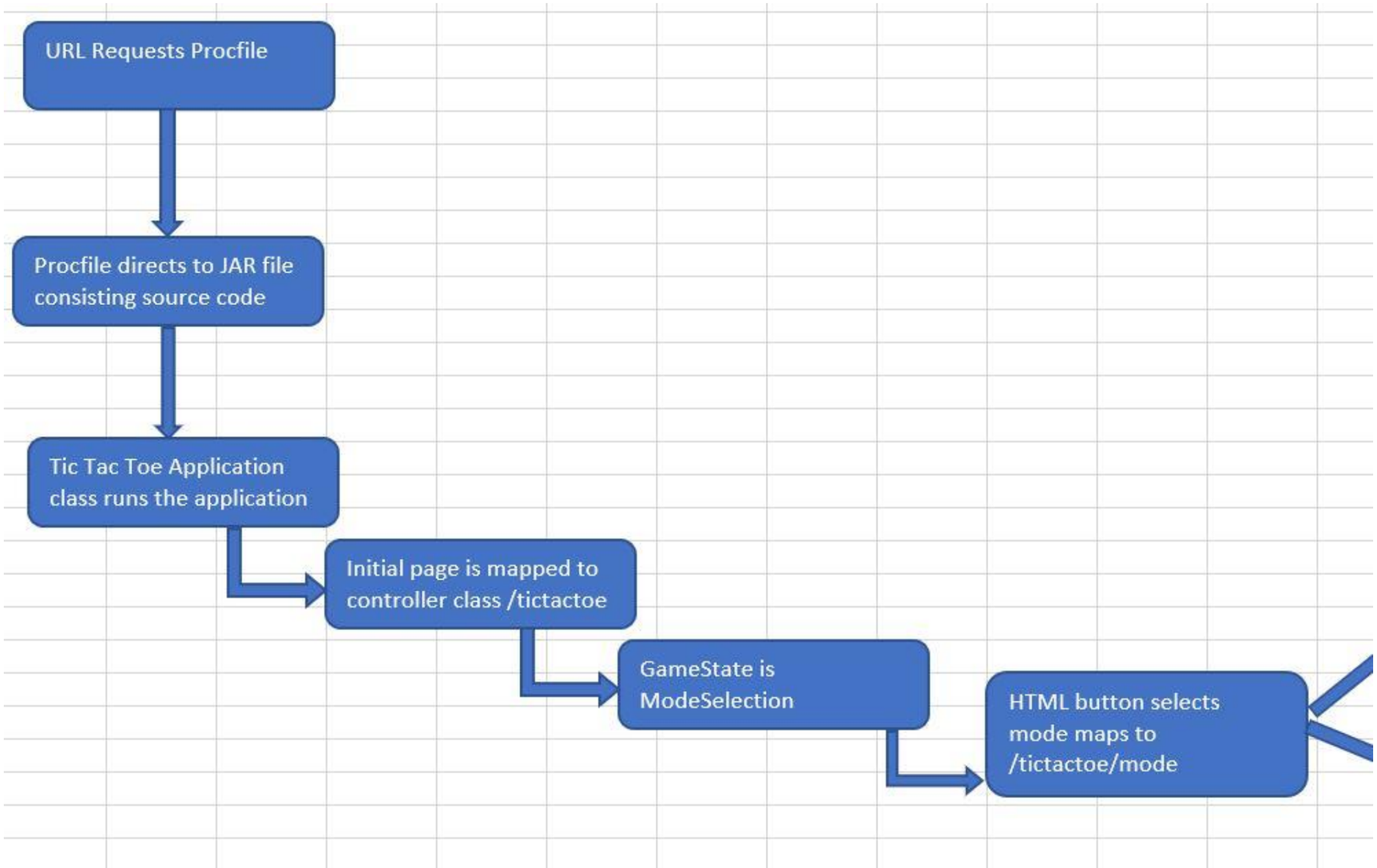
- **Minimax Algorithm** for providing hints to player.
- **Alpha Beta Pruning Minimax Algorithm** for the hard level of the AI powered game.
- **Magic Square Method** for the intermediate level of the AI powered game.
- **Randomization algorithm** for the easy level of the AI powered game.
- Board class to draw game board and other methods to make the move and check winner, etc.
- Game State class to initiate all the required variables and reset and new game method for the game.
- Game Controller class which controls the input values from the user and then act upon it accordingly to execute the game appropriately.
- Constants class to instantiate an object of each class.
- Default html file to set up the initial page.
- CSS file for styling the page.
- Tic Tac Toe html file to control the buttons which are mapped to the controller class.
- **Spring boot framework** to integrate the front end and back end of the java application.
- Application class to run the spring boot application.
- POM file carries the dependencies, properties and plugins to build the web application successfully.
- Jar file deployed to **Heroku** and run using the procfile.

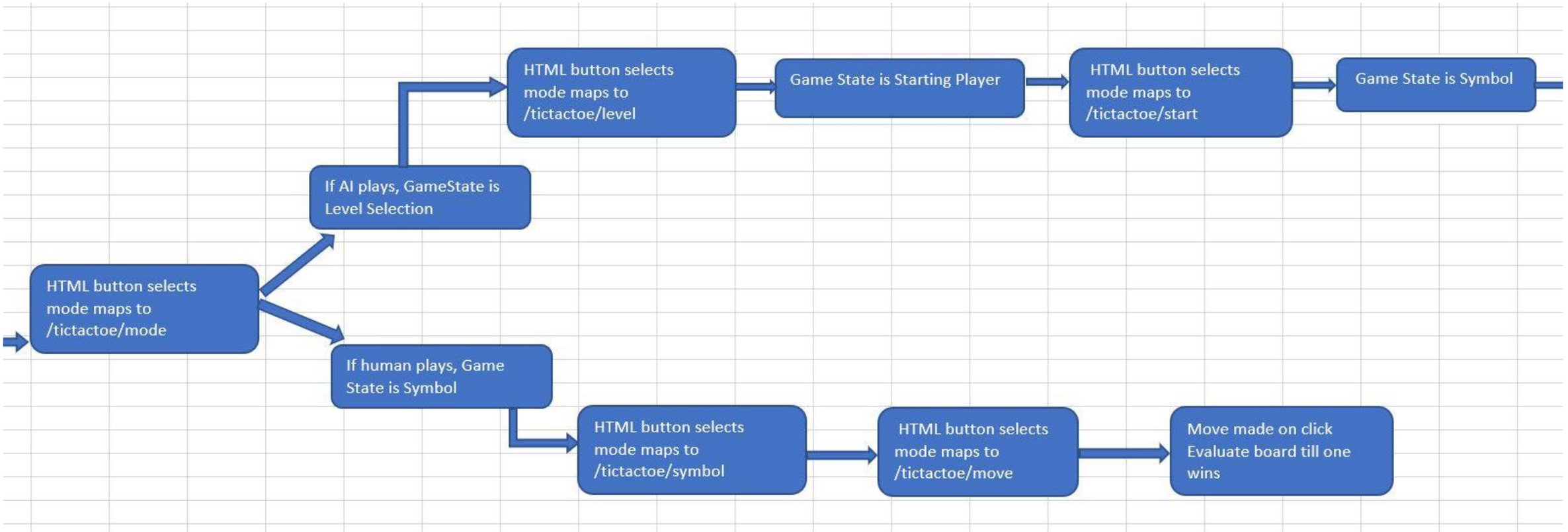
COMMENTS:

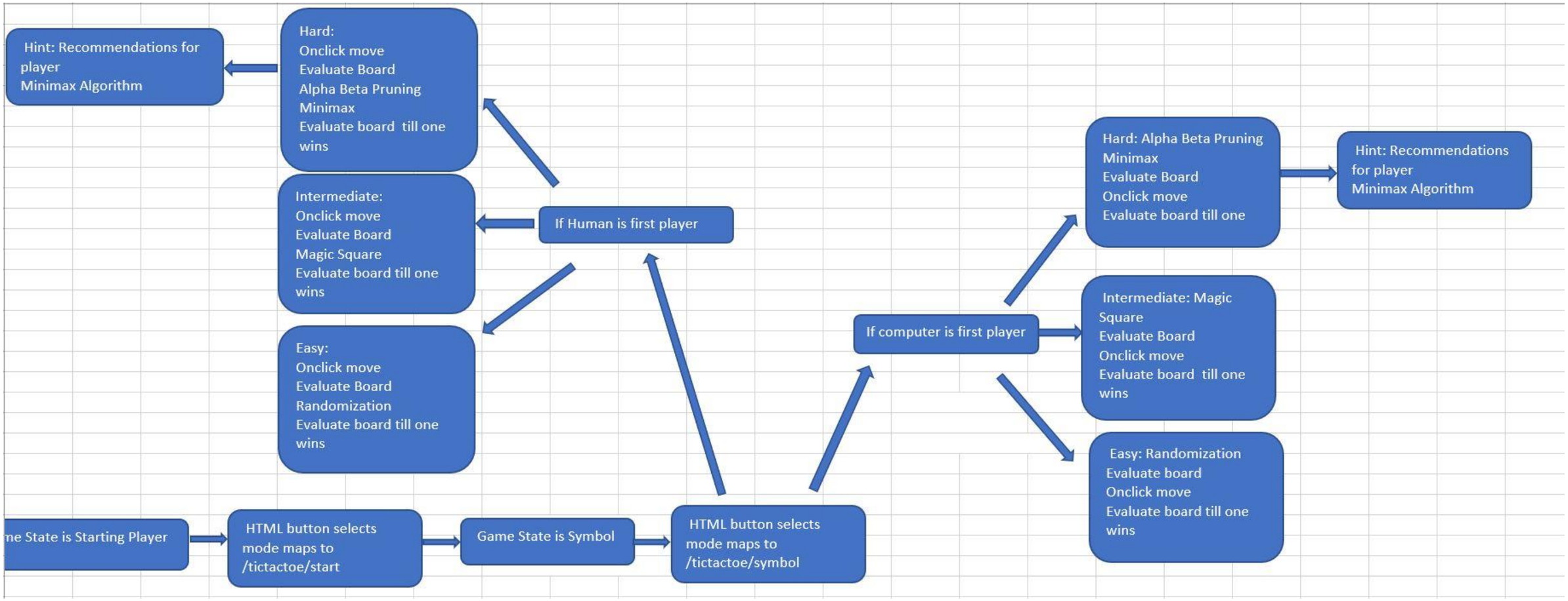
- Hints/Recommendations are not provided for all modes and levels of the game.
- Only three levels of game are provided.



LOW LEVEL DIAGRAM


URL Requests Procfile
Procfile directs to JAR file consisting source code
Tic Tac Toe Application class runs the application
Initial page is mapped to controller class /tictactoe
GameState is ModeSelection
HTML button selects mode maps to /tictactoe/mode


HTML button selects mode maps to /tictactoe/mode
If AI plays, GameState is Level Selection
HTML button selects mode maps to /tictactoe/level
Game State is Starting Player
HTML button selects mode maps to /tictactoe/start
Game State is Symbol
If human plays, Game State is Symbol
HTML button selects mode maps to /tictactoe/symbol
HTML button selects mode maps to /tictactoe/move
Move made on click Evaluate board till one wins



HIGH LEVEL DIAGRAM