**Project Charter**

**Tic Tac Toe Solver**

**5/12/23**

# PROJECT STATEMENT

Tic Tac Toe is what is known as a “solved game” in which every game scenario has a known optimal response. Thus, if you are playing by the most optimal strategy, you will win or tie every time. However, this “optimal strategy” is obscure and difficult to recognize. I will be creating a Tic Tac Toe simulation in Java, complete with an adversarial search algorithm for responding to the player’s actions with the correct response. Furthermore, The Width and height of the tic tac toe board is adjustable, so games will be able to be played on 4x4, 5x5, and 3x3 boards too.

# CONCISE PROJECT OVERVIEW

A short narrative on the duration, budget, approvals needed, key stakeholders, assumptions, constraints and major risks

There is no budget necessary to conduct this project. There are no external APIs that I will be needing, so there is no opportunity to spend money. The stakeholders of the project include myself (developer), and any competitive or recreational tic tac toe players who wish to understand the best strategy available to them. This is being made under the assumption that these people share the same curiosity I do to understand what optimal tic tac toe looks like. The constraints I am operating under is primarily the small time limit given to work on this project, so I will be restricting this application to a terminal based application.

# SCOPE STATEMENT

SMART goals or objectives would include deliverables. Clarify as necessary what the scope includes and does not include.

Specific: I will be creating a terminal based Java simulation of tic tac toe, where the player plays against an adversarial search algorithm which wins or ties every time.

Measurable: The algorithm must win every time, and take less than 20 seconds each turn to think.

Attainable: The project requires no budget, APIs or premade assets.

Realistic: While tic tac toe is a simple, causal game, the logic behind an optimal algorithm for winning in tic tac toe would be applicable to any game with a net zero outcome.

Time specific: I will achieve creating the tic tac toe within the first week, and spend the other two weeks creating the algorithm for winning.

# STAKEHOLDERS

The first stakeholder is me as the developer and producer of this product. My grade is dependent on how successfully the application fulfils the success criteria. My work reflects my experience and effort and should be treated as such.

# TIMELINE

Refer to the Work Breakdown Excel Sheet.

# BUDGET ESTIMATE(S)

There are no sources of cost within the application plan, as I will be developing everything from scratch. If I am short for time, I can utilize a prebuilt tic tac toe api to save time, however that will cost roughly $20, so I will not be doing that.

# RISKS AND CONTINGENCY PLANS

There is a low risk of the AI not functioning as intended. The largest difficulty will be creating a tic tac toe simulation with enough game state information to make decisions off of, and simulate thousands of potential game timelines at once. There is a small chance that my computer will not be able to run such a program, however I can use an AB cutoff to mitigate