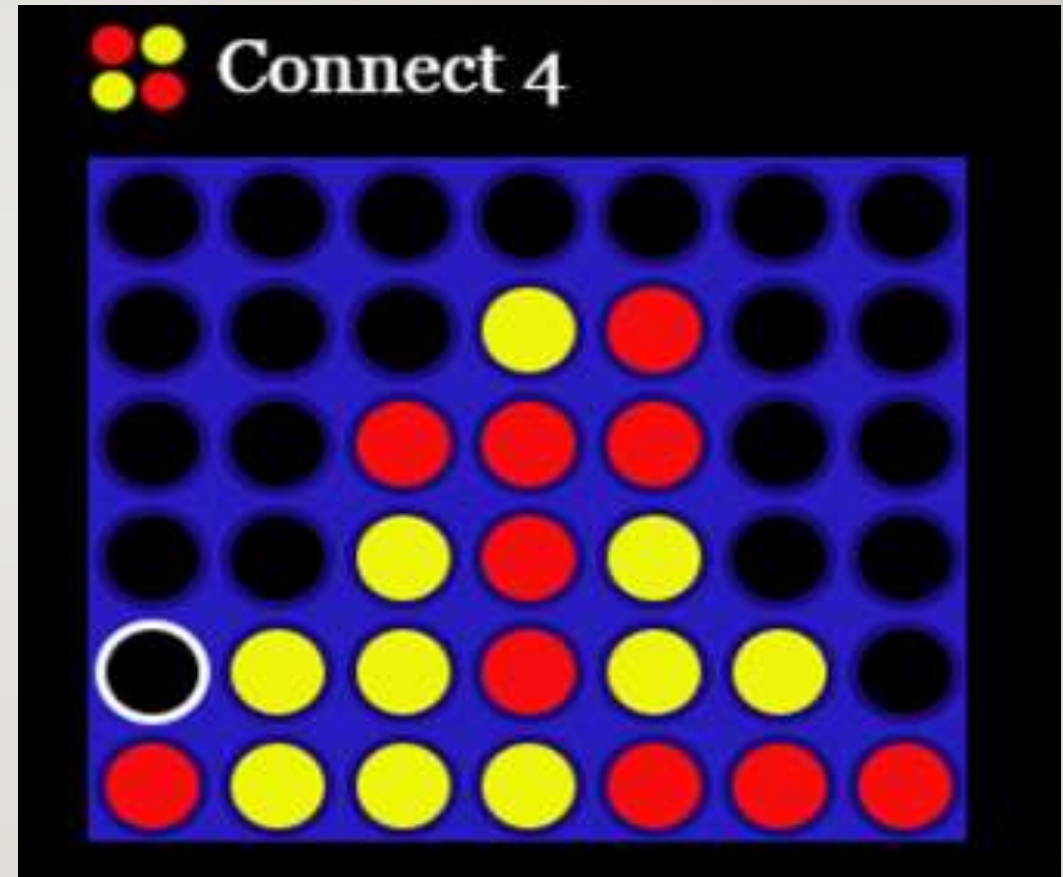# MASTERING CONNECT 4 GAME

TEAM MEMBERS:

- VARSHINI VEM

- HARSHITHA KAIRAMKONDA

- MOURYA TALLAPALLY

OBJECTIVES

- Goal is to build an agent to play against the user in a connect 4 game.

- Minimax algorithm will be used to help the agent beat the user, which is better when compared with alpha-beta pruning and Q-learning in terms of applicability and Search Space.

- To create user-friendly graphical user interface(GUI) that allows players to easily interact with the game.

- Test the game to ensure that there are no issues.

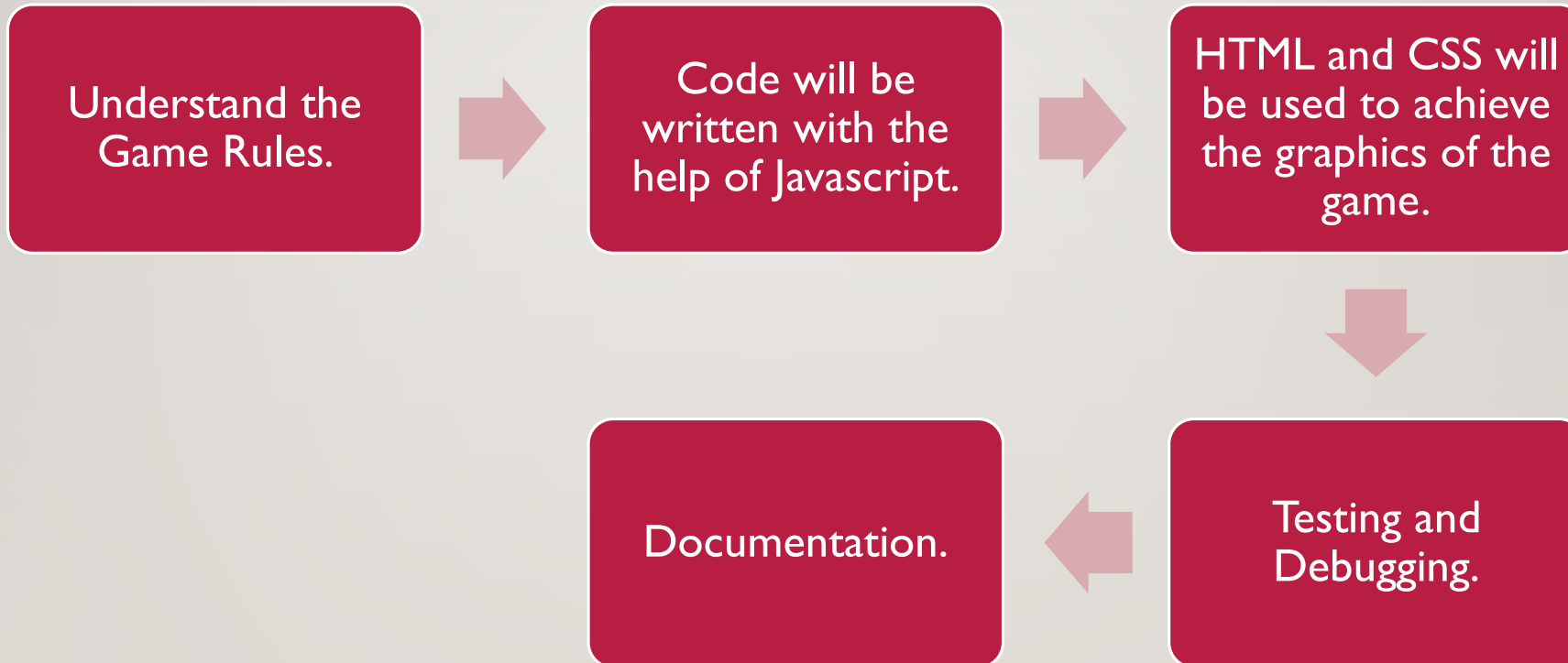- Ensure that the game can be expanded further if needed.

CONNECT 4 GAME OVERVIEW

- This game Connect-Four is a tic-tac-toe game played by two players.

- In this game the players take turns placing pieces on a vertical board.

- The board is 7 columns long and 6 rows high.

- Each player uses pieces of a specific color, usually black and red or sometimes green and red.

- The goal is to be the first to get four pieces in a horizontal, vertical, or diagonal line.

- Since the board is vertical, parts inserted in a certain column always fall in the lowest unoccupied row in that column.

- As soon as a column contains 6 parts, it is full and no further parts can be placed on the column.

- Both the players begin with 21 similar pieces and the first player to reach a series of four connected pieces wins the game.

- If all the players have played and neither player has four parts in a row, the game is a tie.

WHAT IS MINIMAX ALGORITHM

- It is a decision-making algorithm used in game theory.

- It considers two players min and max, and min always picks up a minimum value score from game and max always picks up maximum value score.

- The value for each game move is decided based on some heuristics.

APPROACH

Understand the Game Rules.

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Code will be written with the help of Javascript.

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HTML and CSS will be used to achieve the graphics of the game.

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Documentation.

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Testing and Debugging.

DELIVERABLES

An index file with AVG HTML document which will help in running the game in a browser.

Minimax javascript file will contain the code of execution of agent along with the game logic in it.

A CSS file.

EVALUATION METHODOLOGY

TO RUN THE GAME, THE AVG HTML DOCUMENT NEEDS TO BE RAN.

THEN THE TURN-1 OF THE GAME WILL BE PLAYED BY THE USER, WHERE USER WILL SELECT ANY ROW FROM 7 ROWS AND DROP A COIN, THE NEXT TURN WILL BE PLAYED BY THE AGENT.

WINNER WILL BE DECIDED WHEN ONE OF THE PLAYER HAS 4 COINS CONNECTED IN A HORIZONTAL, VERTICAL OR DIAGONAL FASHION.

GAME OUTPUT