AI Group Project - Meeting Minutes

Team Members: Amith Nair, Deepayan Datta, Muvazima Mansoor and Sherin Cherian

Date	Minutes
22/02/2022	● Formation of the group. ● Common areas of interests discussed. ● GitHub repository created.
28/02/2022	● Brainstorming of Project ideas. ● Tic Tac Toe, Flappy Bird, 2048, generic ML problem, Rubix cube, Tetris, Wordle, Snake game, etc.
07/03/2022	● Literature review and feasibility analysis of different project ideas. ● 2048 was selected as a project idea since it was challenging and not much research was done on the application of various AI algorithms from different families in 2048.
14/03/2022	● Literature review of various AI algorithms to determine which algorithms would suit our use case and be diverse enough to be compared across different evaluation metrics.
17/03/2022	● Expectimax, MCTS and tuple based Q Learning were chosen as the remaining algorithms after extensive research. ● Multiple GitHub repositories were looked at to get an exhaustive idea on how to approach the problem.
25/03/2022	● Initial gaming framework and layout of 2048 was implemented using pygame. ● Introduction and related works written in the report.
26/03/2022	● The Greedy Best First Search algorithm was implemented as a Baseline. ● Different heuristics were explored such as Monotonicity, Smoothness, Max value and Empty Cell. ● Greedy Best First Search algorithm discussion and results added to report.
28/03/2022	● The Expectimax algorithm was implemented with multiple heuristics. ● Expectimax algorithm discussion and results added to report. ● Score of 4096 obtained with exponential empty cell heuristic and with equal weightage with depth =2.
04/04/2022	● Monte Carlo Tree Search was implemented and tested with different heuristics such as merge score, max tile score, sum of all tile scores, etc. ● Merge score heuristic gave the best result. ● Score of 4096 obtained with depth of 4 and rollout=100. ● MCTS discussion and results added to report.
06/04/2022	● Q-Learning was implemented and was equipped to use different heuristics such as Tuple based collaborative feature slicing, and snake heuristics. ● Score of 4096 was observed with 1000 episodes of training. ● Q learning discussion and results added to report.

08/04/2022	● MCTS ,Q learning and Expectimax were experimented with alternate heuristic method (snake heuristics) ● Expectimax gave a score of 8192 with snake heuristic and depth=4 ● Report updated.
09/04/2022	● The algorithms were compared and rigorously tested across different evaluation metrics like performance, average max tile score, average time to reach 2048. ● Report updated.
10/04/2022	● Final presentation. ● Cleaning code and reviewing the report. ● Submission of Project.