MAIS 202 Deliverable 1 - Project proposal
2048 Game Solver

Project Idea

For our project, we will design and train an AI model to play and solve the popular game '2048'. The game in question is a single player puzzle-game that requires the player to move and merge blocks/tiles with the same value to create tiles of large values. Usually the objective is to combine these tiles (powers of 2) until you can reach the 2048 (2^11) tile!

The game is quite simple but finding the optimal sequence of moves is non-trivial. It will require some reinforcement learning to teach the model which moves to make.

Choice of dataset

There is no normal dataset that we can use, as 2048 has randomness. The model will learn from its past mistakes.

Methodology

a. Data Preprocessing
   The model will examine the board state after every move. Each board state can be represented as a 16-dimensional array (4x4 board = 16 tiles) .
b. Machine learning model
   The model will have to choose between 4 moves (up, down, right, left), to translate the tiles
c. Evaluation Metric
   The value of a model will be evaluated according to the total sum of all the elements, and the highest tile number achieved

Application

We will build a simple web interface where the users can watch the AI play the game.

Input

The user will be able to start the game with a start button.
For comparison with the model, we could also invite the user to play the game.

Output

As the game is started, the user will see the decision making of the model, as well as the score obtained at every state of the game.