

# CS3243 Tutorial Group 7

Tutorial 4 – Adversarial Search



# Quick recap

- Games; utility-maximizing players; game tree
- Optimal strategy: minimax = **minimize maximum loss**
  - Two players; MAX starts
  - Depth-first search of the game tree
  - MAX chooses move to maximize the minimum payoff
  - MIN chooses move to minimize the maximum payoff
- Sub-game perfect Nash equilibrium (via backwards induction)

- Alpha-beta pruning: remove sub-trees that do not affect minimax decision
  - Alpha = best choice (maximum) found along the path for MAX
  - Beta = best choice (minimum) found along the path for MIN
  - Alpha at node at depth N = maximum Beta among its descendants at N + 1
  - Remove sub-trees with  $\beta < \alpha$  (MAX) /  $\alpha > \beta$  (MIN)