

W5

Adversarial Search and the Minimax Algorithm (5A)

Game

Tic tac toe, connect4...

State space search

States

Actions

Transition model

Costs

Payoffs

Terms

Game tree

Node

Ply

Move

Terminal or leaf node

Heuristic

Alpha-Beta Pruning (5B)

alpha: high score for any max node so far

Beta: low score for any min node so far

Chance and the Expectimax Algorithm (5C)

chance

dice

cards

coins

Alpha-beta pruning, if score are bounded

Game Theory and Pure Strategy Equilibrium (5D)

Prisoners' Dilemma

Extensive form

tree-like

Standard form

Table-like

Dominant, and dominated strategy

cell inspection

Successive elimination of dominated strategies

Steps

Find dominant strategy and remove it

Do the same for opponent

Repeat until solution or fail

Might not always work

Dominant strategy

Strictly dominant

Weakly dominant

Could be equal

Mixed Strategy Equilibrium (5E)

Rock Paper Scissors

Zero sum game