CS 171 F24 Final Exam Reference Sheet

Created by Steven He

Uninformed Search

todo

Heuristic Search

todo

Game Search

todo

Constraint Satisfaction

todo

Logic

todo

Probability & Uncertainty, Bayesian Networks

todo

Intro to ML, Linear Regression, kNN

todo

Decision Trees and Neural Networks

todo

Reinforcement Learning

Markov Property - Future is independent of past given present:

$$\mathbb{P}[S_{t+1}|S_t] = \mathbb{P}[S_{t+1}|S_1, \ldots, S_t] \text{ where } S_t \text{ is state at time } t$$

We use matrix $\mathcal{P}$ to define transition property from state s to s', denoted as probability in row s, column s'.

$$\mathcal{P} = \begin{bmatrix} \mathcal{P}_{11} & \ldots & \mathcal{P}_{1n} \\ \vdots & & \vdots \\ \mathcal{P}_{n1} & \ldots & \mathcal{P}_{nn} \end{bmatrix}, \mathcal{P}_{ss'} = \mathbb{P}[S_{t+1} = s'|S_t = s]$$

Markov Process/Chain - Sequence of states $S_1, S_2, \ldots$ satisfying Markov property. Formally defined as tuple $\langle \mathcal{S}, \mathcal{P} \rangle$ i.e. (set of states, prob matrix)
Episode - Some sequence of traveresed states in a MP
Markov Reward Process - Give states in MP some reward. We "gain" reward R_{t+1} when transitioning from states $S_t \to S_{t+1}$
placeholder intermediary stuff goes here

	Evaluate Policy, π	**Find Best Policy, π^***
MDP Known (Planning probs)	Policy Evaluation	Policy/Value Iteration
MDP Unknown	MC and TD Learning	Q-Learning