

Problem 1a

CS 221 - Pacman

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$$V_{opt}(s, d) = \begin{cases} \text{Utility}(s) & \text{IsWin}(s) \text{ or } \text{IsLose}(s) \\ \text{Eval}(s) & d = 0 \\ \max_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d+1) & \text{Player}(s) = \text{Pacman} \\ \min_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d) & \text{Player}(s) = \text{Ghost } 1 \\ \vdots & \vdots \\ \min_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d) & \text{Player}(s) = \text{Ghost } n \end{cases}$$

At initial state, call $V_{opt}(s, d_{max})$

Problem 3a

$$V_{opt}(s, d) = \begin{cases} \text{Utility}(s) & \text{IsWin}(s) \text{ or } \text{IsLose}(s) \\ \text{Eval}(s) & d = 0 \\ \max_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d+1) & \text{Player}(s) = \text{Pacman} \\ \text{Average}_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d) & \text{Player}(s) = \text{Ghost } 1 \\ \vdots & \vdots \\ \text{Average}_{a \in \text{Actions}(s)} V_{opt}(\text{Succ}(s, a), d) & \text{Player}(s) = \text{Ghost } n \end{cases}$$

At initial state, call $V_{opt}(s, d_{max})$