

$$\begin{split} v_{k+1}(s) &= \max_{\mathbf{a} \in \mathcal{A}} \ \left( \mathcal{R}_s^{\mathbf{a}} + \gamma \sum_{s' \in \mathcal{S}} \mathcal{P}_{ss'}^{\mathbf{a}} v_k(s') \right) \\ \mathbf{v}_{k+1} &= \max_{\mathbf{a} \in \mathcal{A}} \mathcal{R}^{\mathbf{a}} + \gamma \mathcal{P}^{\mathbf{a}} \mathbf{v}_k \end{split}$$