

	Bertsekas	Sutton and Barto	Puterman	Powell
Stages	k	t	t	t
First Stage	N	1	1	1
Final Stage	0	T	N	T
State Space			S	S
State	i, i_k	s	s	s, S_t
Action Space	$U(i)$		$A = \cup_{s \in S} A_s$	\mathcal{A}
Action		a	a	a
Policy	$\mu_k(i), \pi$	$\pi(s, a), \pi$	$\pi, d_t^{MD}(s)$	π
Transitions	$p_{ij}(\mu_k(i))$	$\mathcal{P}_{ss'}^a$	$p_t(\cdot s, a)$	$\mathbb{P}(s' S_t, a_t)$
Cost	$g(i, u, j)$	$\mathcal{R}_{ss'}^a$	$r_t(s, a)$	$C_t(S_t, a_t)$
Terminal Cost	$G(i_N)$	r_T	$r_N(s)$	$V_T(S_T)$
Discount	α	γ	λ	γ
Q-Value (Policy)	$J_k^\pi(i)$	$\mathcal{Q}^\pi(s, a)$		
Q-Value (Optimal)				$\mathcal{Q}(S^n, a)$
Value (Policy)	$J_k^\pi(i)$	$V^\pi(s)$	u_t^π	$V_t^\pi(S_t)$
Value (Optimal)	$J_k^*(i)$	$V^*(s)$	u_t^*	$V_t(S_t)$
Bellman Operator	T		\mathcal{L}, L	\mathcal{M}

Optimal Value Function

- Bertsekas [2007]

$$J_k^* = \min_{u \in U(i)} \sum_{j=1}^n p_{ij}(u) (g(i, u, j) + \alpha J_{k-1}^*(j))$$

- Sutton and Barto [1998]

$$V^*(s) = \max_a \mathcal{P}_{ss'}^a [\mathcal{R}_{ss'}^a + \gamma V^*(s')]$$

- Puterman [1994]

$$u_t^*(s_t) = \max_{a \in A_{s_t}} \left\{ r_t(s_t, a) + \sum_{j \in S} p_t(j | s_t, a) u_{t+1}^*(j) \right\}$$

- Powell [2011]

$$V_t(S_t) = \max_{a_t} \left\{ C_t(S_t, a_t) + \gamma \sum_{s' \in S} \mathbb{P}(s' | S_t, a_t) V_{t+1}(s') \right\}$$

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