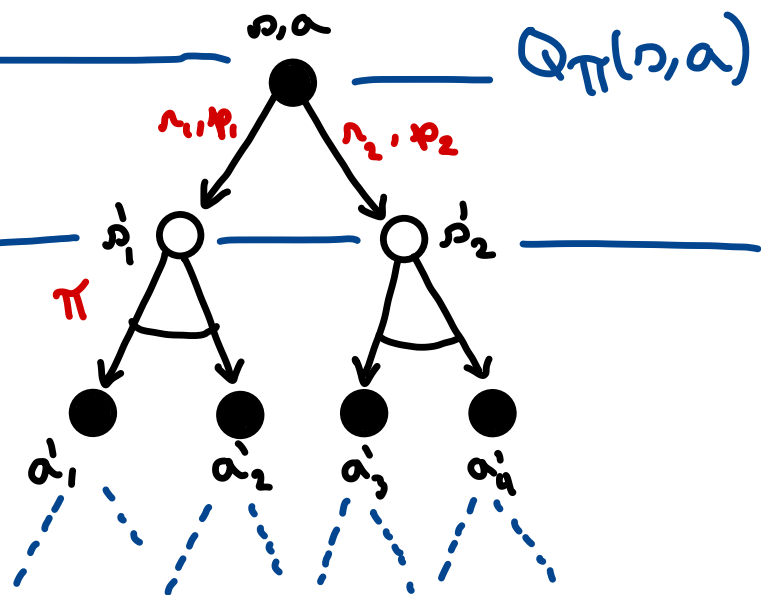


q_* from v_*

$$q_\pi(s, a) = \sum_{s'} p(s'|s, a) [r + \gamma v(s')]$$

$$q_*(s, a) = R_s^a + \gamma P_{ss'}^a v_*(s')$$



q_* from q_*

$$q_\pi(s, a) = \sum_{s'} p(s'|s, a) [r + \gamma \sum_a \pi(a|s) q(s', a)]$$

$$q_*(s, a) = R_s^a + \gamma P_{ss'}^a \max_a q_*(s', a')$$