

# Ergodic MDP

(no exam)

## Definition

An MDP is ergodic if the Markov chain induced by any policy is ergodic.

For any policy  $\pi$ , an ergodic MDP has an *average reward per time-step*  $\rho^\pi$  that is independent of start state.

$$\rho^\pi = \lim_{T \rightarrow \infty} \frac{1}{T} \mathbb{E} \left[ \sum_{t=1}^T R_t \right]$$