



## Why

We want to talk about making a sequence of decisions.

## Definition

Let  $S$  and  $A$  be finite sets. Let  $T : S \times A \rightarrow (S \rightarrow [0, 1])$  so that for each  $s \in S$  and  $a \in A$ ,  $T_{sa} : S \rightarrow [0, 1]$  is a probability distribution over  $S$ . We call the ordered triple  $(S, A, T)$  a *finite state-action process*.

A *trajectory* in the *state set*  $S$  and *action set*  $A$  is a sequence in  $S \times A$ .

Let  $r : S \times A \times S \rightarrow \mathbf{R}$ ,  $N \in \mathbf{N}$ .

A *decision process* is a sequence  $(S, A, T, r, \gamma, N)$ , consists of two sets, a function set, an action

## Other terminology

Decision processes are commonly called *markov decision processes*.<sup>1</sup>

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<sup>1</sup>As usual, we avoid this terminology in connection with the projects guidelines against using particular names.



