$\rho : s_0 \xrightarrow{\alpha_1} s_1 \xrightarrow{\alpha_2} s_2 \xrightarrow{\alpha_3} s_3 \xrightarrow{\alpha_4} \dots$ execution-fragment

$TS = \langle S, Act, \to, I, AP, L \rangle$ LTS

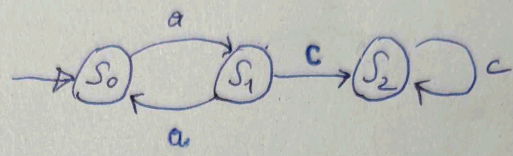
We fix $A \subseteq Act$ a subset of actions.

ρ is A-fair $\iff \overset{\infty}{\exists} j \geq 0.\ \alpha_j \in A$

ρ is strongly fair $\iff \left(\overset{\infty}{\exists} j \geq 0\ (A \cap Act(s_j) \neq \phi) \Rightarrow \overset{\infty}{\exists} j \geq 0.\ \alpha_j \in A \right)$

ρ is weakly fair $\iff \overset{\infty}{\forall} j \geq 0\ (A \cap Act(s_j) \neq \phi) \Rightarrow (\overset{\infty}{\exists} j \geq 0.\ \alpha_j \in A)$

Example. TS

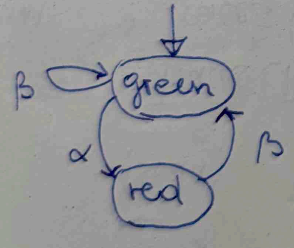


$E_1 := (s_0\, a\, s_1\, a\, s_0)^\omega$ is <u>not</u> $\{c\}$-fair
is $\{a\}$-fair, $\{a,c\}$-fair

$E_2 := s_0\, a\, s_1\, c\, (s_2\, c)^\omega$ is $\{c\}$-fair, $\{a,c\}$-fair
is not $\{a\}$-fair

$E_1 := (s_0\, a\, s_1\, a\, s_0)^\omega$ is not strongly $\{c\}$-fair
is weakly $\{c\}$-fair

$E_2 := s_0\, a\, s_1\, c\, (s_2\, c)^\omega$ is strongly $\{a\}$-fair strongly $\{c\}$-fair
is weakly $\{a\}$-fair weakly $\{c\}$-fair



$green(\beta\ green)^\omega$ is <u>not</u> weakly $\{\alpha\}$-fair.

$TS \models_{fair} P \ :\iff\ FairTraces(TS) \subseteq P$

Exercise 3.1, 3.5, 3.6, 3.15