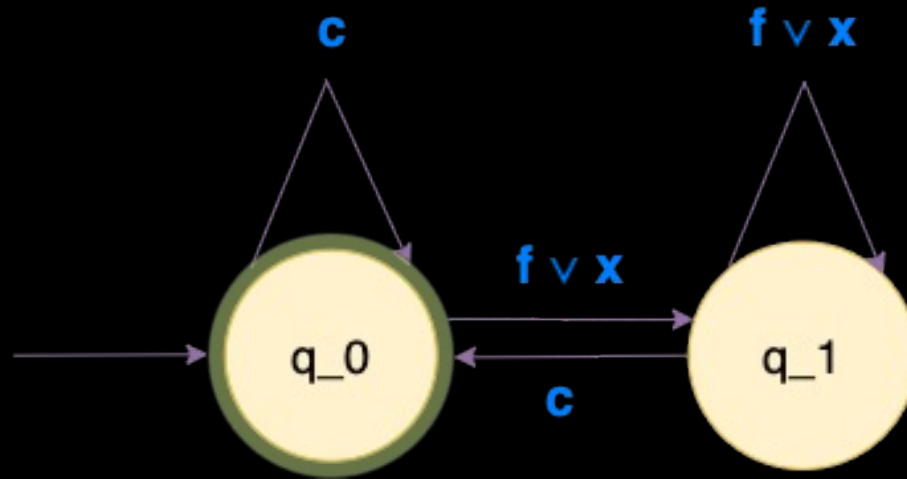


Büchi automaton: laptop in yoga studio



Key:

c = laptop is Charles, f = staff is front desk,
x = front door is locked

$$A = \{Q, \Sigma, \delta, q_0, F\}$$

$$Q = \{0, 1\}$$

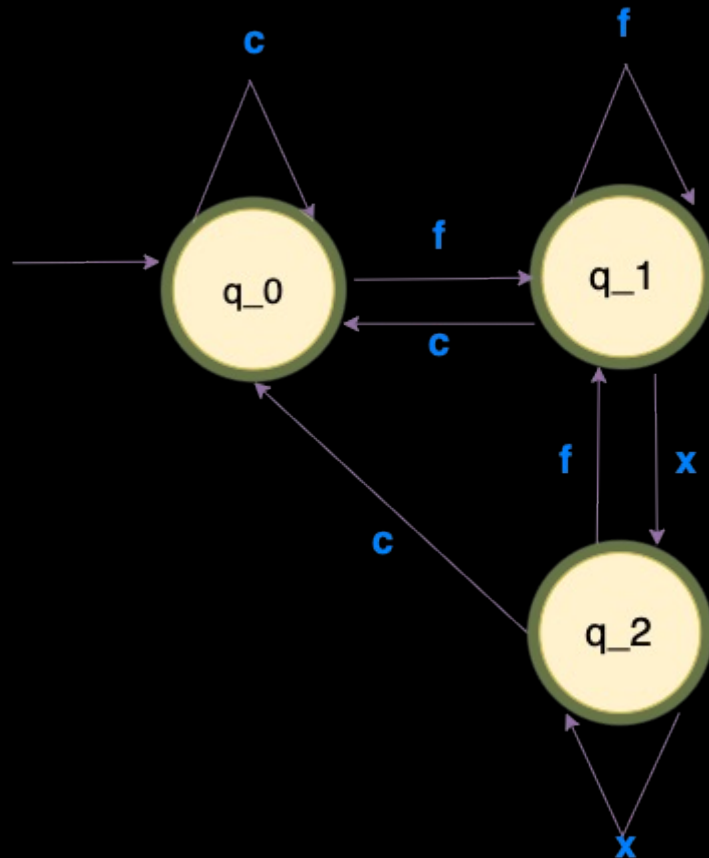
$$\Sigma = \{c, f, x\}$$

$$\delta = \{0c0, 0f1, 1c0, 0x1, 1x0, 1f1, 1x1\}$$

$$q_0 \in Q$$

$$F \subseteq Q$$

Büchi automaton: safety



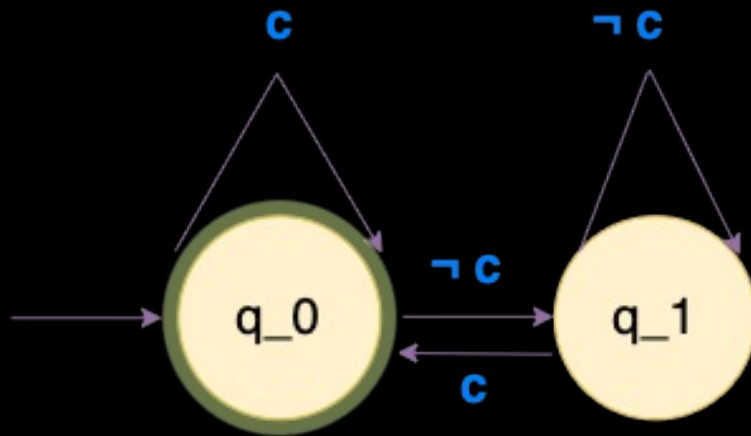
Safety property LTL:

$$\begin{aligned} & (G\ c \vee G(c \rightarrow X\ f)) \wedge \\ & (G\ f \vee (G(f \rightarrow X\ c) \vee G(f \rightarrow X\ x))) \wedge \\ & (G\ x \vee (G(x \rightarrow X\ f) \vee G(x \rightarrow X\ c))) \end{aligned}$$

Closure:

$$\begin{aligned} & (\{q_0, q_1, q_2\} \in F) \rightarrow \\ & cl(A) := \{Q, \Sigma, \delta, q_0, Q\} \end{aligned}$$

Büchi automaton: liveness



Liveness Property LTL:

GF c

Closure:

$cl(A) := \{Q, \Sigma, \delta, q_0, Q\}$
accepts all possible
traces in Σ^ω