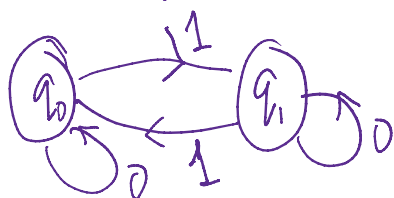


Game

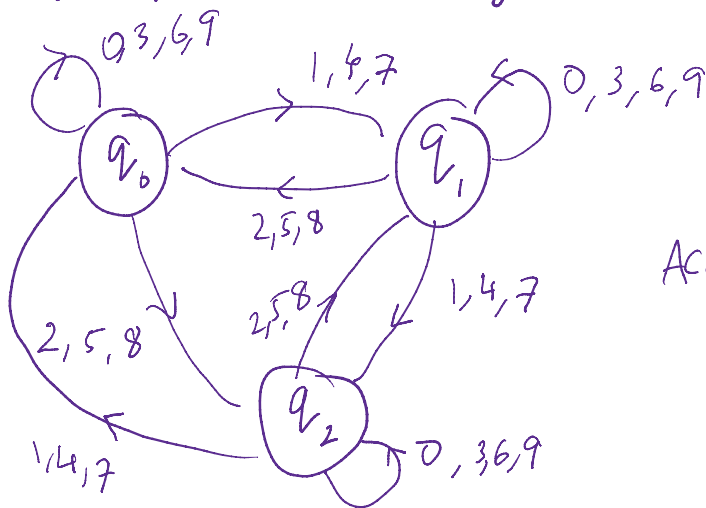
Course topics, motivation (hardware, AI, brains, the universe!)

Canvas, Piazza, Gradescope

① input: 01101-----output: YES if #1's is evenACCEPT if q_0 is final state

②

Accept if input decimal integer is divisible by 3.

ACCEPT if q_0 is final.Finite Automata (DFA) Q : finite set of states $Q = \{q_0, q_1, \dots\}$ Σ : input alphabet, e.g. $\Sigma = \{0, 1\}, \{a, b, c, \dots, z\}$
(finite) $\{0, 1, \dots, 9\}$.

(finite)

$\{0, 1, \dots, 9\}$

$$\delta: Q \times \Sigma \rightarrow Q$$

transition function $(q, a) \rightarrow q'$

$F \subseteq Q$: accepting states.

$q_0 \in Q$: start state.

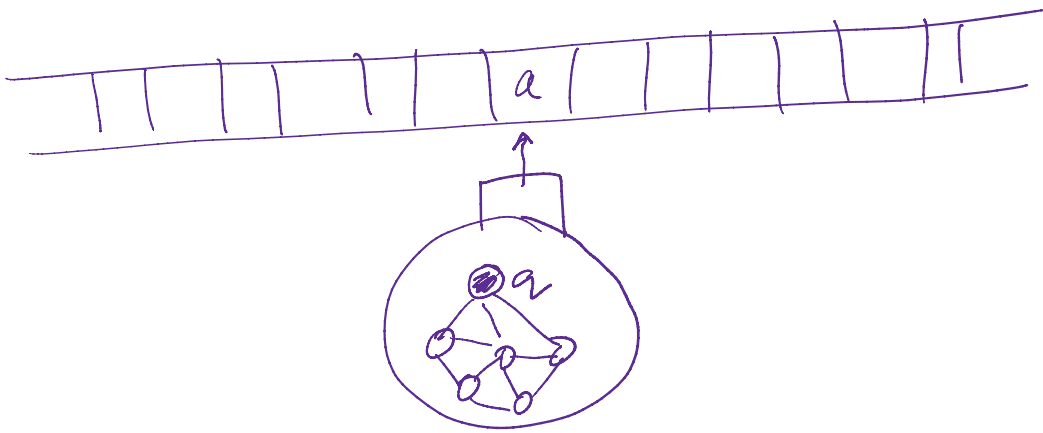
TM.

DFA + Tape + "head"

Γ : Tape alphabet, $\Sigma \cup \{-\}$

$$\delta: Q \times \Gamma \rightarrow Q \times \Gamma \times \{L, R\}$$

$$(q, a) \rightarrow (q', a', L)$$



Q. Does "tape"/Memory really help?!