

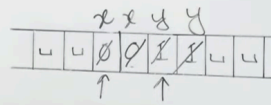
Turing Machines

Formal Definition

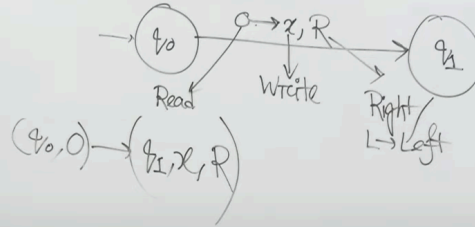
7-tuple $(Q, \Sigma, \Gamma, \delta, q_0, q_{\text{accept}}, q_{\text{reject}})$

- ① $Q \rightarrow$ Finite set of states.
- ② $\Sigma \rightarrow$ Input Alphabet $\rightarrow \cup / \emptyset$
- ③ $\Gamma \rightarrow$ Tape Alphabet $\rightarrow \Sigma \in \Gamma$
 $\cup \in \Gamma$
 $xy \in \Gamma$
- ④ $\delta: Q \times \Gamma \rightarrow Q \times \Gamma \times \{L, R\}$
- ⑤ $q_0 \rightarrow$ starting state
- ⑥ $q_{\text{accept}} \rightarrow$ Accept State
- ⑦ $q_{\text{reject}} \rightarrow$ Reject State.

$0^N 1^N$

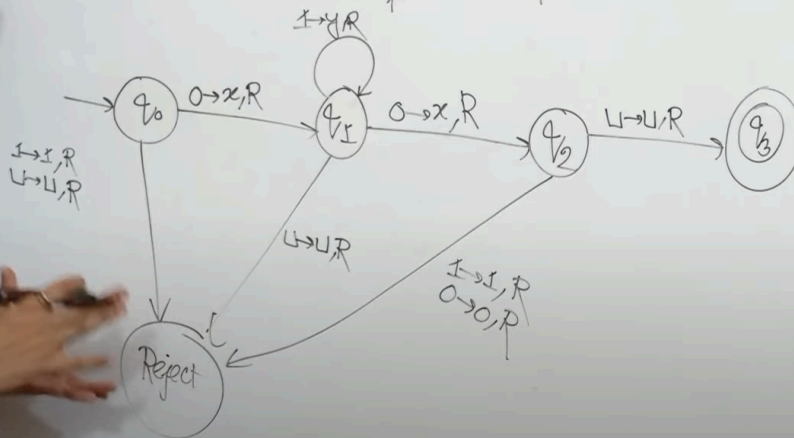
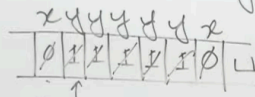


Read, Write
Right / Left



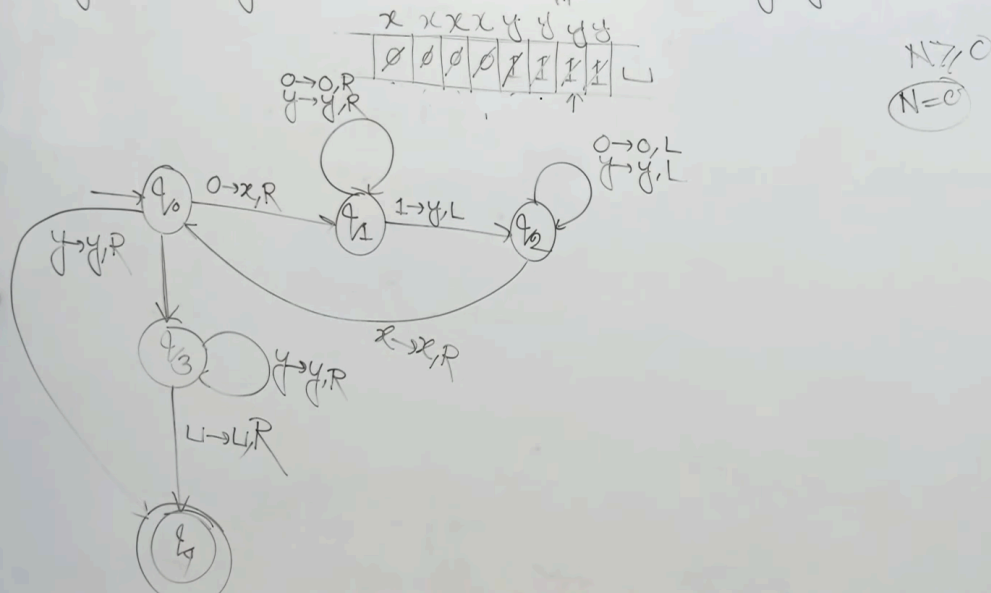
Turing Machines

* Design a Turing machine which recognize the Language, $L = 01^*0$



Turing Machines

* Design a Turing machine which recognize the language, $L = 0^n 1^n ; n \geq 0$



Turing Machines

* Design a Turing machine which recognize the language, $L = \{a^n b^n \mid n \geq 1\}$

