Turing Machine

Turing machine is the most powerful mathematical model which is same like computer.

A Turing Machine M is defined by

$M = (Q, \Sigma, \delta, q_0, \Gamma, \square, F)$

where,

Q is set of internal states

Σ is the input alphabet

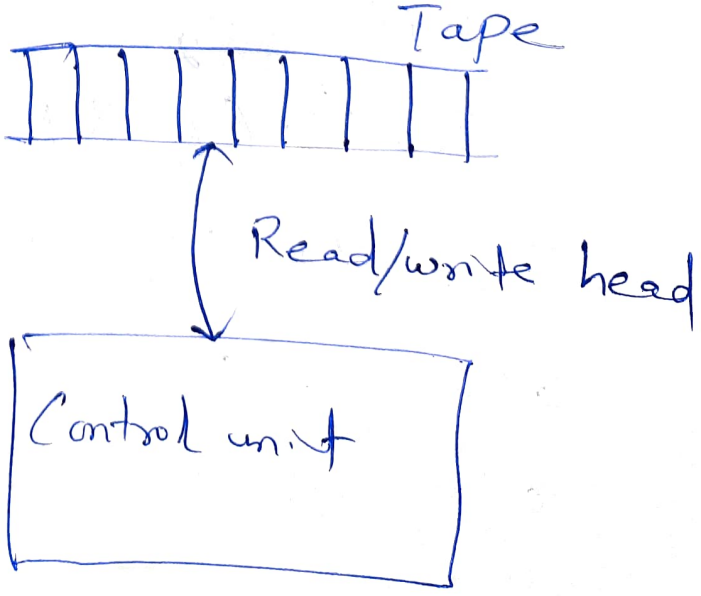
Γ is the finite set of symbols called as tape alphabet

$\square \in \Gamma$ is a special symbol called the blank.

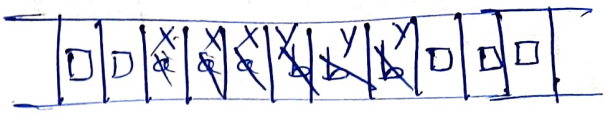
$q_0 \in Q$ is the initial state

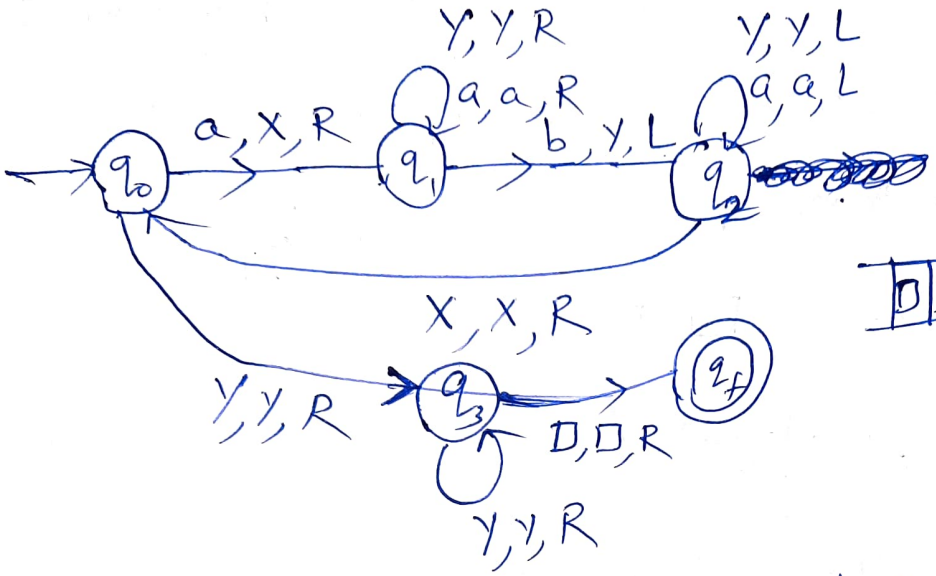
$F \subseteq Q$ is the set of final states

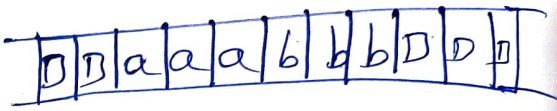
$\delta : Q \times \Gamma \rightarrow Q \times \Gamma \times \{L, R\}$



Ex $L = \{a^n b^n : n \geq 1\}$







q_0 is initial state

q_f is the final state

$\delta(q_0, a) = (q_1, X, R)$

$\delta(q_1, a) = (q_1, a, R)$

$\delta(q_1, Y) = (q_1, Y, R)$

$\delta(q_1, b) = (q_2, Y, L)$

$\delta(q_2, a) = (q_2, a, L)$

$\delta(q_2, Y) = (q_2, Y, L)$

$\delta(q_2, X) = (q_0, X, R)$

$\delta(q_0, Y) = (q_3, Y, R)$

$\delta(q_3, Y) = (q_3, Y, R)$

$\delta(q_3, \square) = (q_f, \square, R)$