Non-deterministic Finite Automata (NFA) : NFA is a finite automaton where for some cases when a single input is given to a single state, the machine goes to more than 1 states, i.e. some of the moves cannot be uniquely determined by the present state and the present input symbol.

An NFA can be represented as **M = { Q, Σ, ∂, q0, F}**

Q → Finite non-empty set of states.

∑ → Finite non-empty set of input symbols.

∂ → Transitional Function.

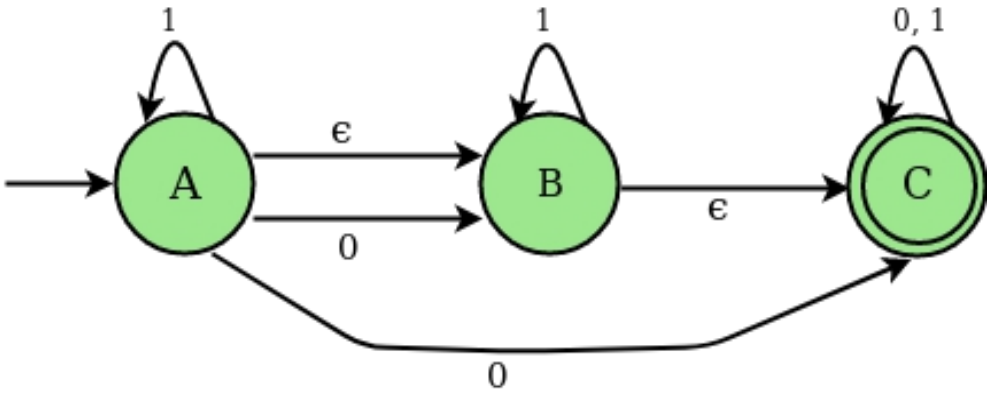
q0 → Beginning state.

F → Final State

NFA with (null) or ∈ move : If any finite automata contains ε (null) move or transaction, then that finite automata is called NFA with ∈ moves

Example :

Consider the following figure of NFA with ∈ move :



Transition state table for the above NFA

STATES	0	1	epsilon
A	B, C	A	B
B	–	B	C
C	C	C	–

Epsilon (∈) – closure : Epsilon closure for a given state X is a set of states which can be reached from the states X with only (null) or ε moves including the state X itself. In other words, ε-closure for a state can be obtained by union operation of the ε-closure of the states which can be reached from X with a single ε move in recursive manner.

For the above example ∈ closure are as follows :

∈ closure(A) : {A, B, C}**∈ closure(B) :** {B, C}**∈ closure(C) :** {C}