Exp. No 5 :

Write a program to convert NFA to DFA.

1 Start State

- Let q_0' = {q_0} → the start state of DFA is the set containing only the NFA start state.
- Create a set DStates = { q_0' } → this will hold all DFA states (subsets of NFA states).
- Initialize a worklist (queue or stack) with q_0'.

2 Process Each DFA State

While the worklist is not empty:

- Remove a set S from the worklist
- For each input symbol a ∈ Σ:
  - Initialize an empty set T = ∅
  - For each state s ∈ S, compute δ(s, a) and add all resulting states to T
  - So:

$$T = \bigcup_{s \in S} \delta(s, a)$$

  - If T is not in DStates, add T to DStates and the worklist
  - Define the DFA transition: δ'(S, a) = T

3 Define Final States

- A DFA state S is final if S ∩ F ≠ ∅
- So:

$$F' = \{S \in DStates \mid S \cap F \neq \emptyset\}$$