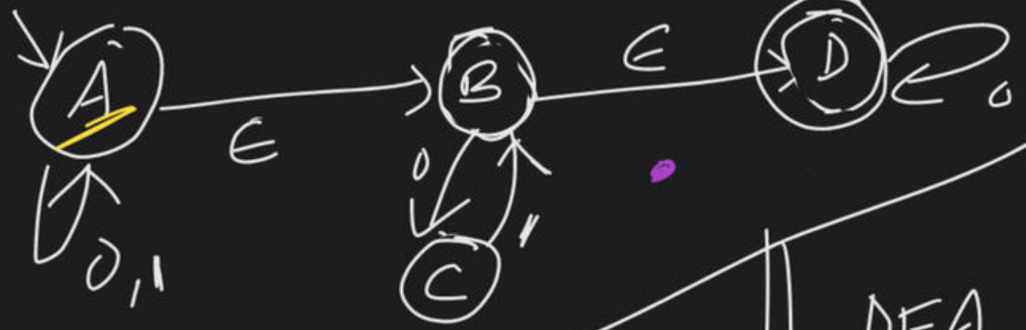
Conversion - I

Complete Course on Theory of Computation

Subbarao Lingamgunta • Lesson 17 • Feb 24, 2022



$\Longrightarrow$ ε, 0, 00000

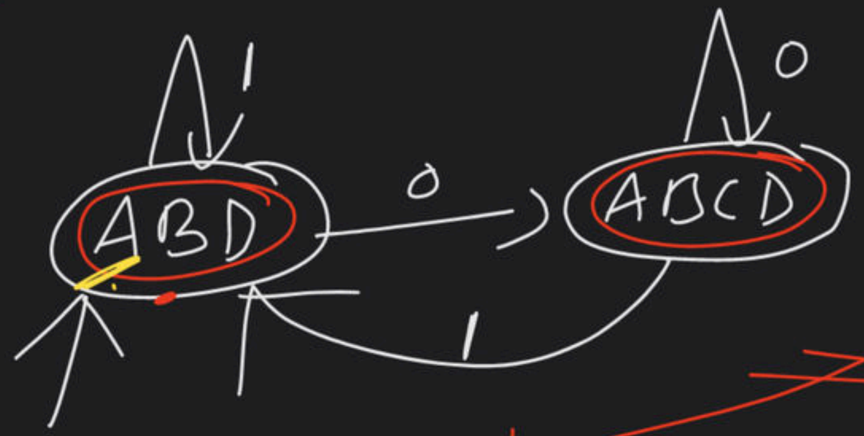
1, 11111, 000011111

11111 0000

10100

0100

DFA



$\Longrightarrow \Sigma^*$

$\Longrightarrow$ M-DFA

ABD

A, 0

B, 0

D, 0

ABD $\xrightarrow{0}$ A, 0 $\Longrightarrow$ ABCD

B, 0

D, 0

ABD, 1 $\Longrightarrow$ A, 1 $\Longrightarrow$ A, B, D

B, 1 $\Longrightarrow$ φ

D, 1 $\Longrightarrow$ φ

ABCD, 1 $\Longrightarrow$ A, 1 $\Longrightarrow$ ABD

B, 1 $\Longrightarrow$ φ

C, 1 $\Longrightarrow$ B, D

D, 1 $\Longrightarrow$ φ

NFA ⟹ DFA

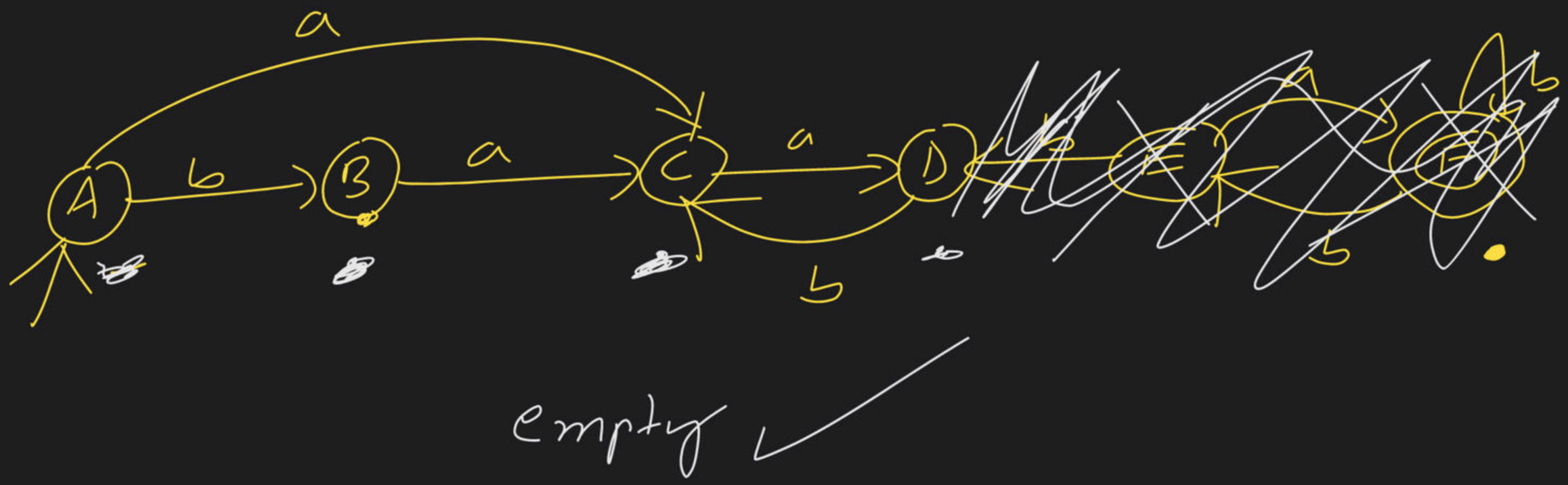
ε-NFA ⟹ NFA ⟹ DFA

Decidable problems of FA

1. Emptiness problem
2. Finiteness problem
3. Equality problem

Emptiness problem

ex Empty Language (or) not ?



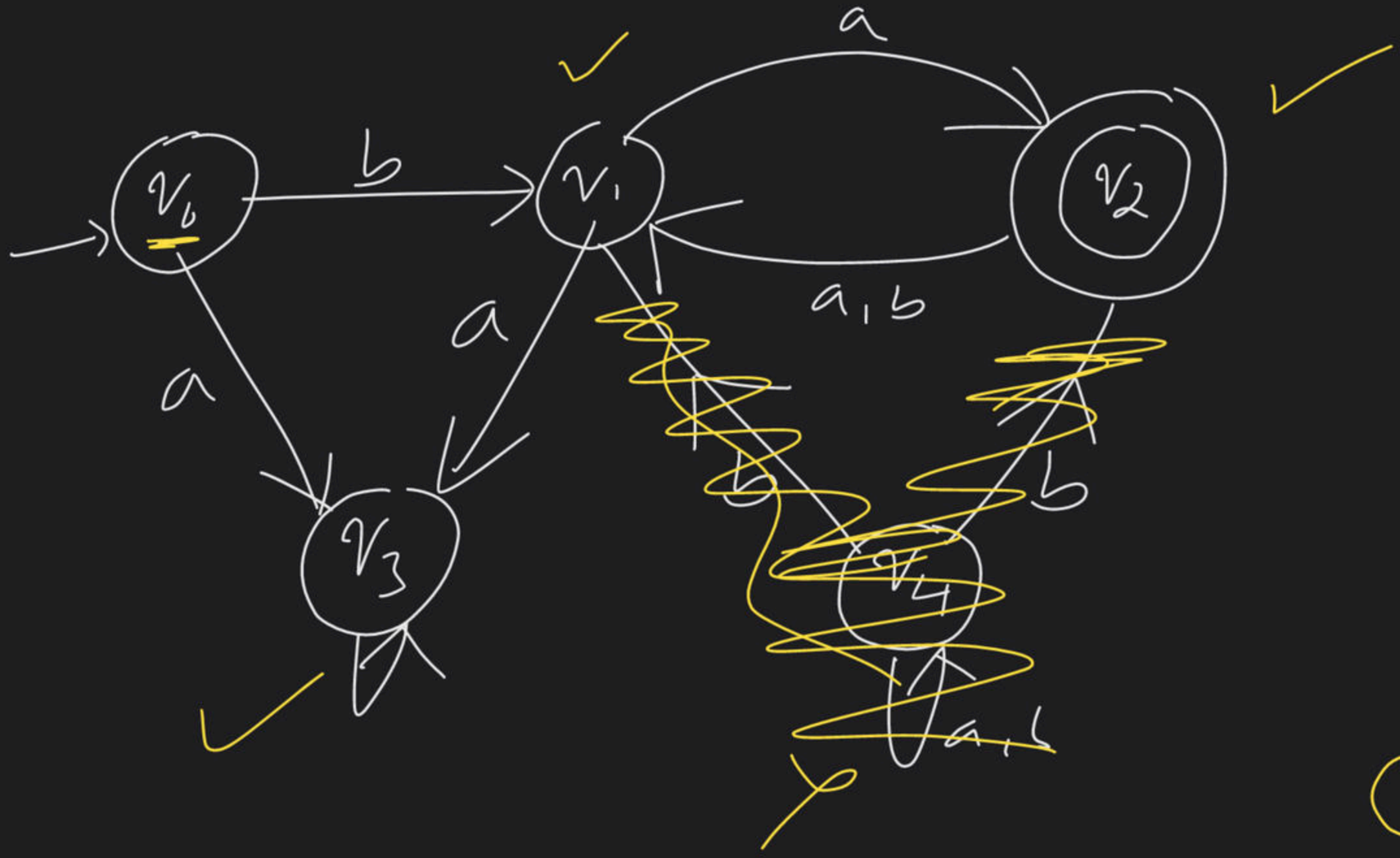
Algo

(1) Eliminate those states * which are not reachable from initial state and its transitions

(2) In the remaining FA if you found atleast 1 final state then given FA accepts non-empty otherwise empty.

ex

E/NE

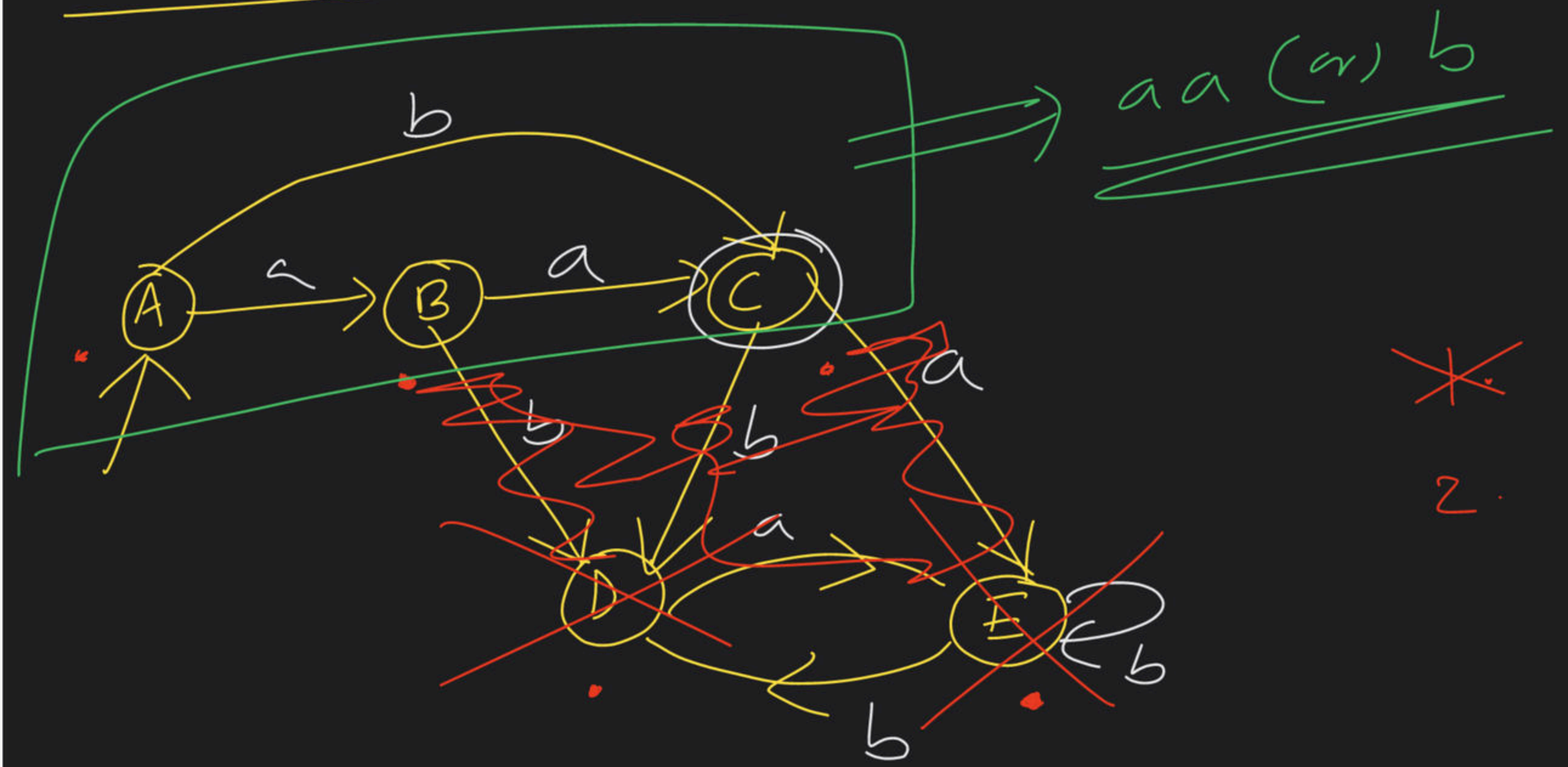


(1) Simplify

(2) Final ✓

NE ✓

Finite nets



$aa(a)b$

2.

Algo

(1) Eliminate those states & its transitions which are not reachable from initial state.

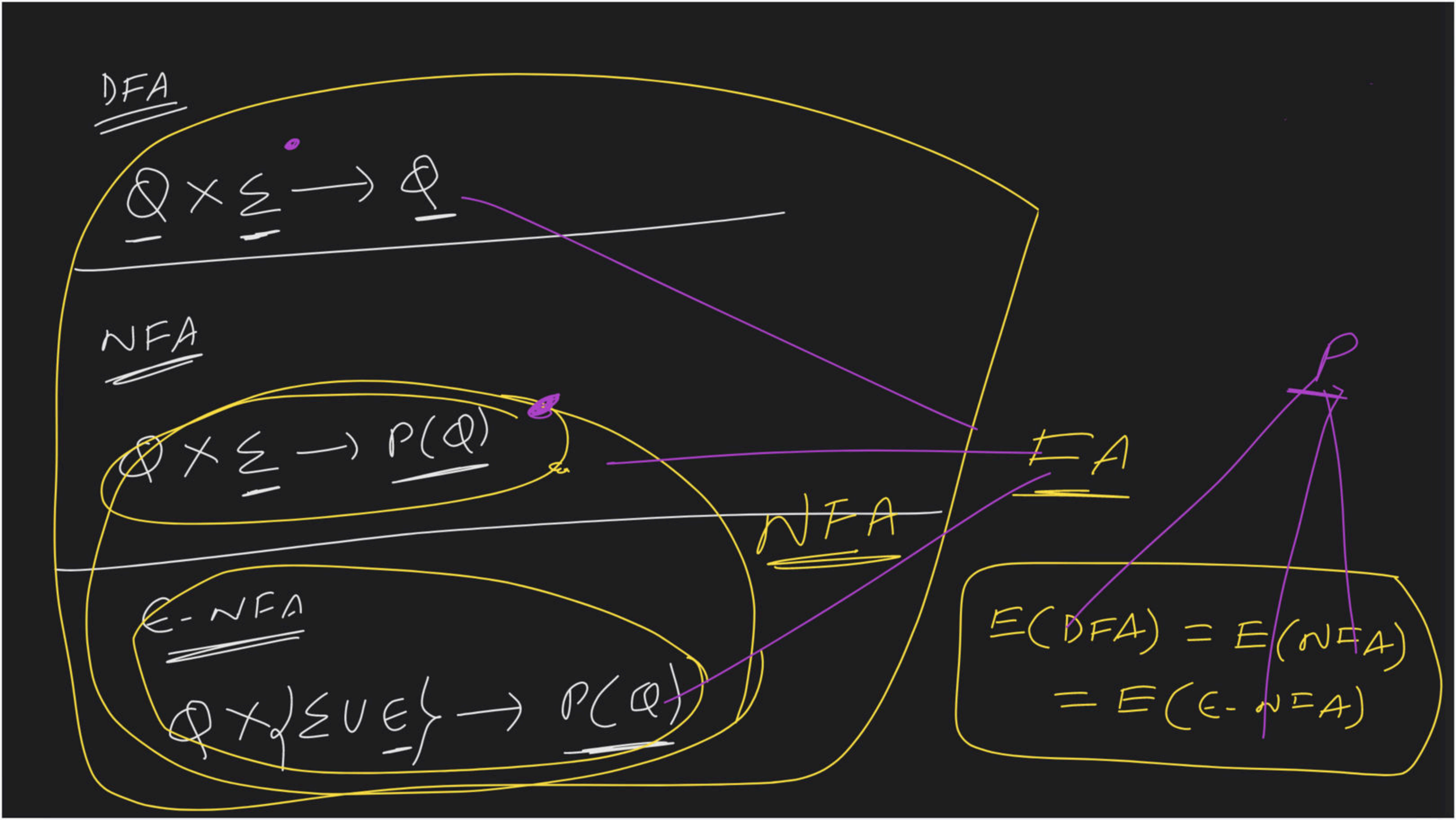
(2) Eliminate those states & its transitions from which we can't reach final.

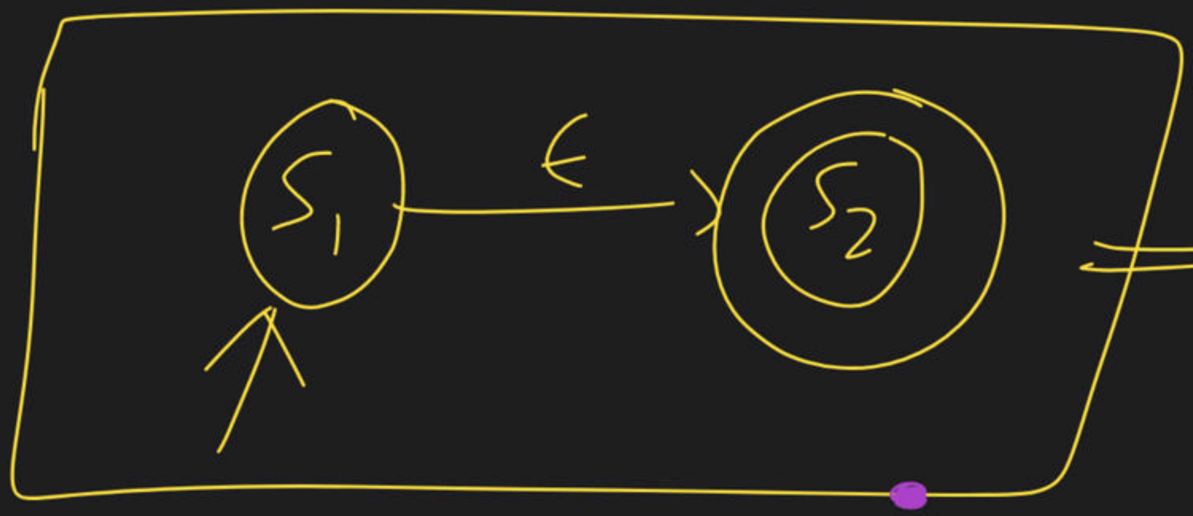
(3) In the remaining FA if loop is present then it accepts infinite language otherwise Finite Language.

Thanks

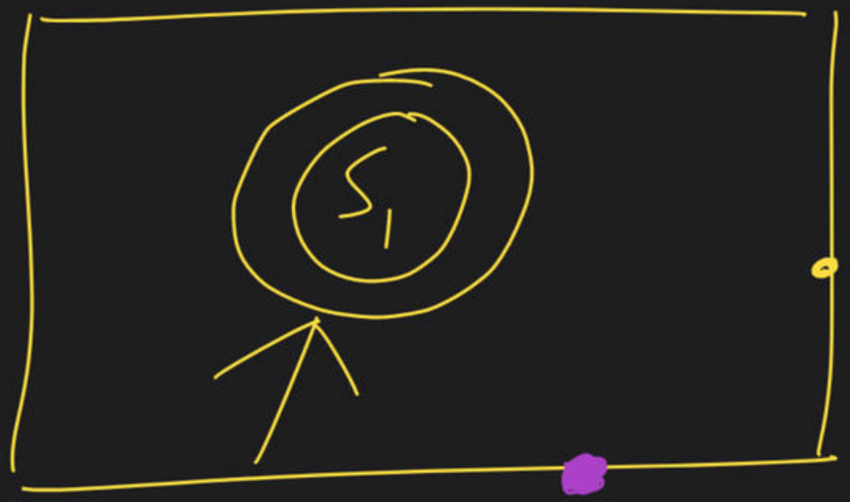
Goto hell

Dedicate Hate


DFA
Q × Σ → Q
NFA
Q × Σ → P(Q)
ε-NFA
Q × {Σ ∪ ε} → P(Q)
NFA
FA
E(DFA) = E(NFA)
= E(ε-NFA)



ϵ-NFA accepts ϵ



DFA accepts ϵ