



NFA dgn ϵ -Transition



NFA's With ϵ -Transitions

- We can allow state-to-state transitions on ϵ input.
- These transitions are done spontaneously, without looking at the input string.
- A convenience at times, but still only regular languages are accepted.



Contoh Soal

- **Soal**

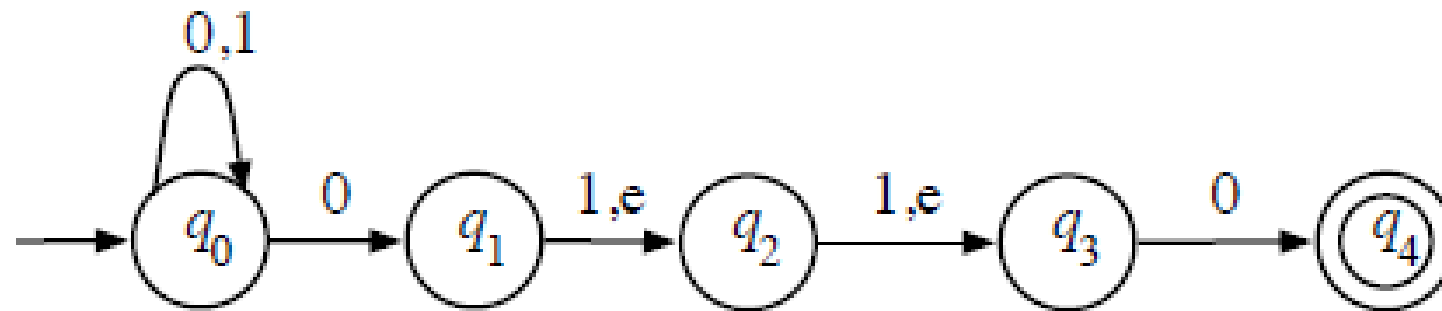
An NFA for the language of all strings over $\{0, 1\}$ that end with one of 0110, 010, and 00.

An NFA for the language of all strings over $\{a, b, c\}$ for which one of (the number of occurrences of a), (the number of occurrences of b), and (the number of occurrences of c) is a multiple of 3.



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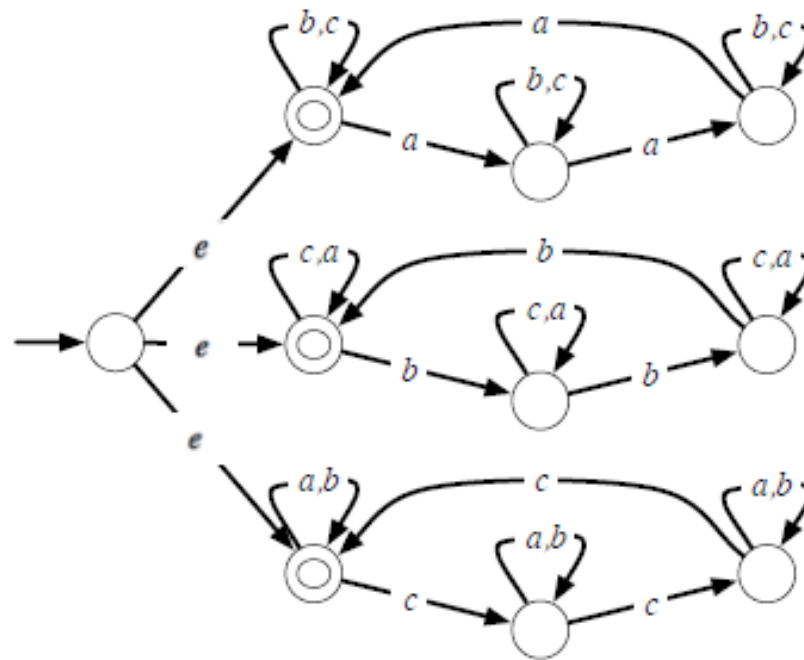
- **Jawab**





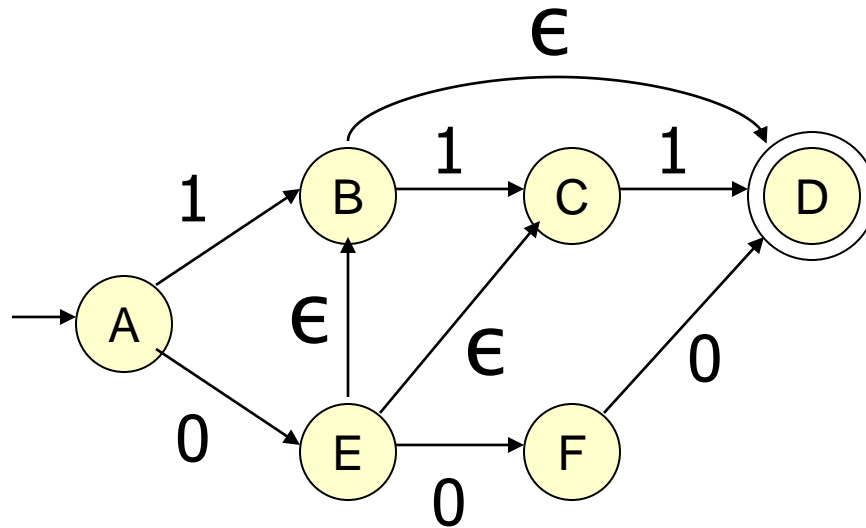
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NFA dgn ϵ -Transition



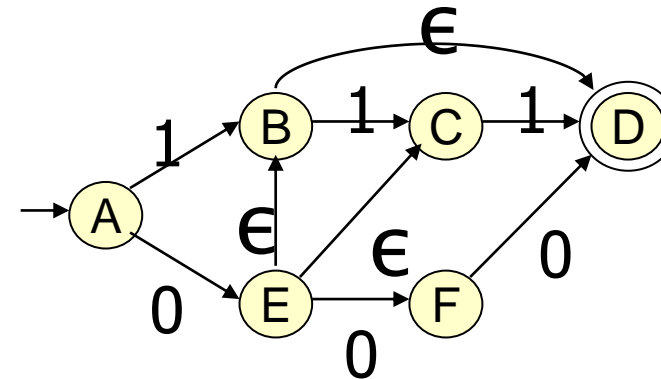
	0	1	ϵ
→ A	{E}	{B}	\emptyset
B	\emptyset	{C}	{D}
C	\emptyset	{D}	\emptyset
* D	\emptyset	\emptyset	\emptyset
E	{F}	\emptyset	{B, C}
F	{D}	\emptyset	\emptyset

- memungkinkan adanya transisi antar state dgn input ϵ



Closure of States

- $CL(q)$ = sekumpulan state yang bisa dicapai dari state q dengan hanya mengikuti busur berlabel ϵ termasuk status dirinya.
- $CL(A) = \{A\}$
- $CL(E) = \{B, C, D, E\}$
- **Closure dari kumpulan state:**
 - gabungan closure setiap state



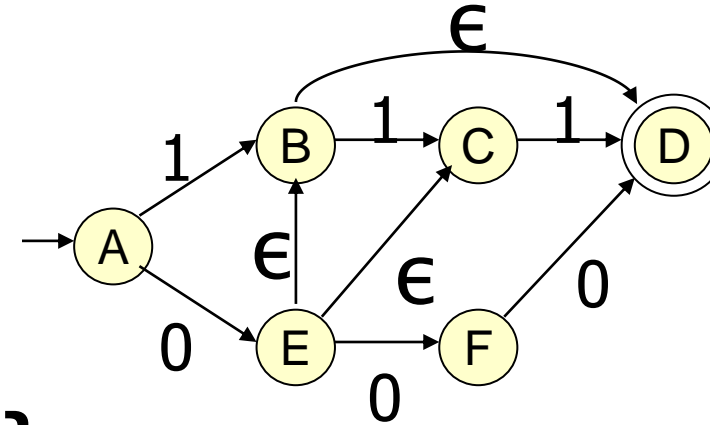


Extended Delta

- **Basis:** $\delta(q, \epsilon) = CL(q)$.
- **Induction:** $\delta(q, xa)$ sbb:
 1. misal $\delta(q, x) = S$.
 2. = union dari $CL(\delta(p, a))$ utk semua p di S .
- **Intuisi:** $\delta(q, w)$ adalah sekumpulan state yang dapat dicapai dari q dengan mengikuti path busur w



Cth: Extended Delta



- $\delta(A, \epsilon) = \text{CL}(A) = \{A\}$.
- $\delta(A, 0) = \text{CL}(\{E\}) = \{B, C, D, E\}$.
- $\delta(A, 01) = \text{CL}(\{C, D\}) = \{C, D\}$.
- **Language** dari sebuah ϵ -NFA adalah sekumpulan string w dimana $\delta(q_0, w)$ mengandung final state.