

Ekivalensi Non deterministic ke Deterministic Finite Automata

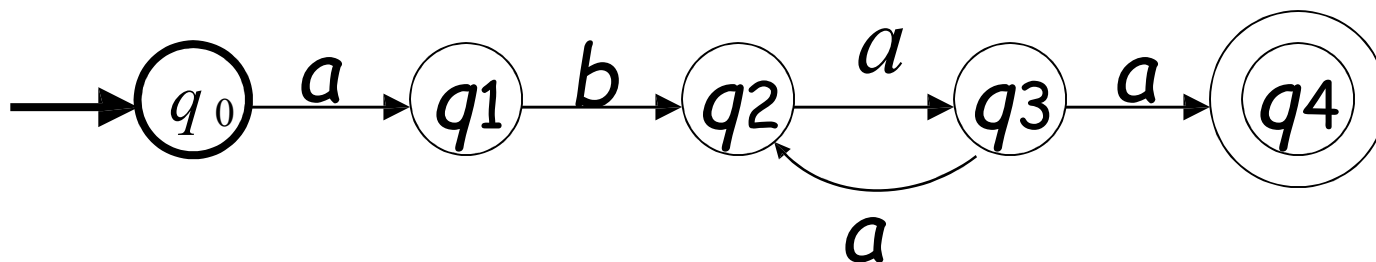
Pertemuan 3

Mahasiswa mampu menjelaskan arti, tujuan dan definisi pengubahan mesin Non Deterministic Finite Automata ke mesin Deterministic Finite Automata

Ekuivalensi Non-Deterministic Finite Automata ke Deterministic Finite Automata

Dari sebuah mesin Non-Deterministic Finite Automata dapat dibuat mesin Deterministic Finite Automata-nya yang ekuivalen (bersesuaian). Ekuivalen di sini artinya mampu menerima bahasa yang sama.

Mesin NFA



Gbr . Mesin 4

Tahapan pengubahan mesin Non-Deterministic Finite Automata ke mesin Deterministic Finite Automata

langkah 1

1. Buatlah 5 tuple dari mesin 4

$$Q = \{q_0, q_1, q_2, q_3, q_4\}$$

$$\Sigma = \{a, b\}$$

$$S = q_0$$

$$F = \{q_4\}$$

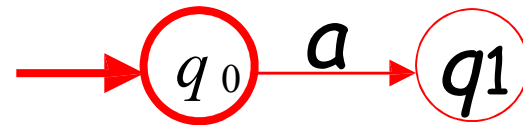
δ	a	b
q0	{q1}	\emptyset
q1	\emptyset	{q2}
q2	{q3}	\emptyset
q3	{q2, q4}	\emptyset
q4	\emptyset	\emptyset

Bagaimana mengubah mesin 4 menjadi DFA ?

langkah 2

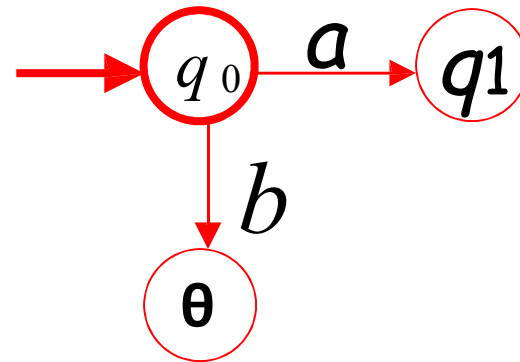
Buatlah mesin DFA berdasarkan state yang muncul, state dimulai dari state awal q_0

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



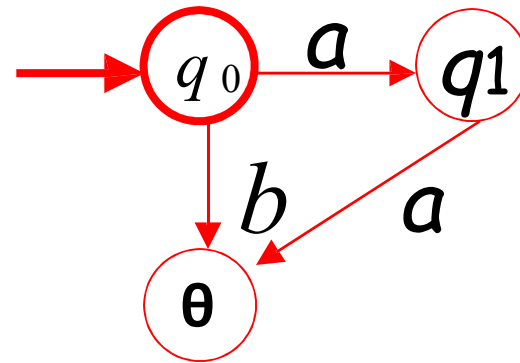
langkah 2

$$\delta (q_0, b) = \theta$$



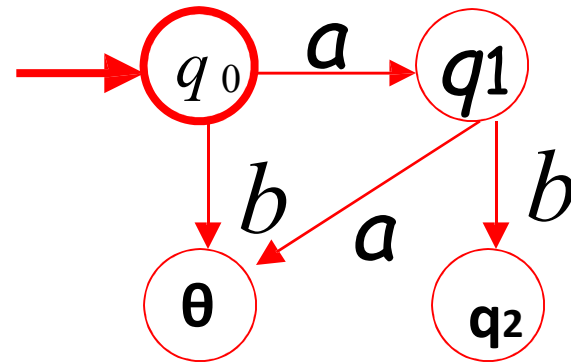
langkah 2

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



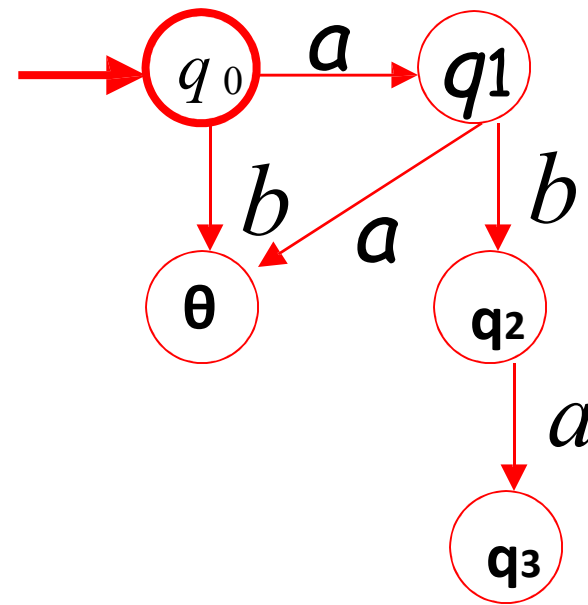
langkah 2

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



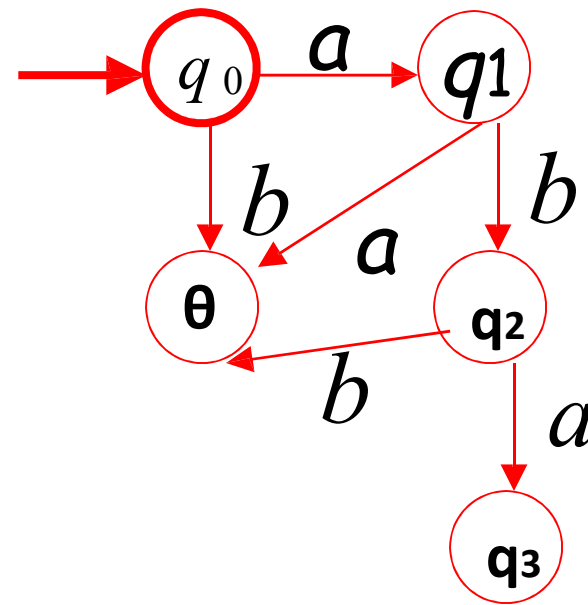
langkah 2

$$\delta(q_2, a) = q_3$$



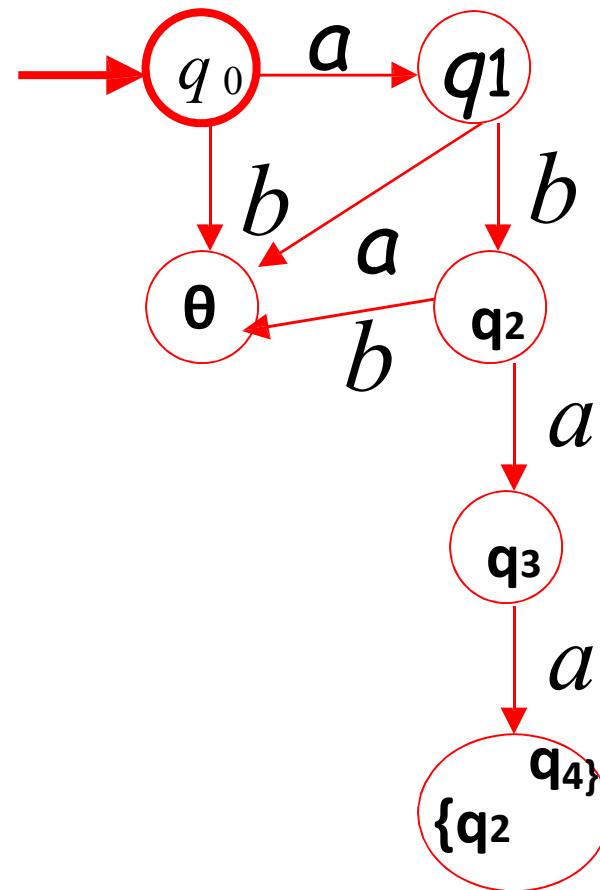
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$$\delta (q_2, b) = \theta$$



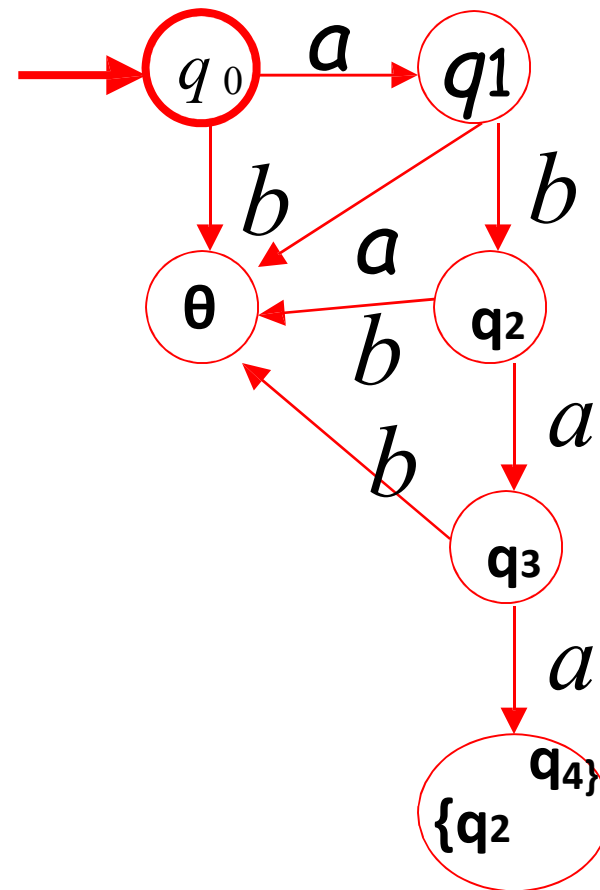
langkah 2

$$\delta(q_3, a) = \{q_2, q_4\}$$



langkah 2

$$\delta (q_3, b) = \theta$$



langkah 2

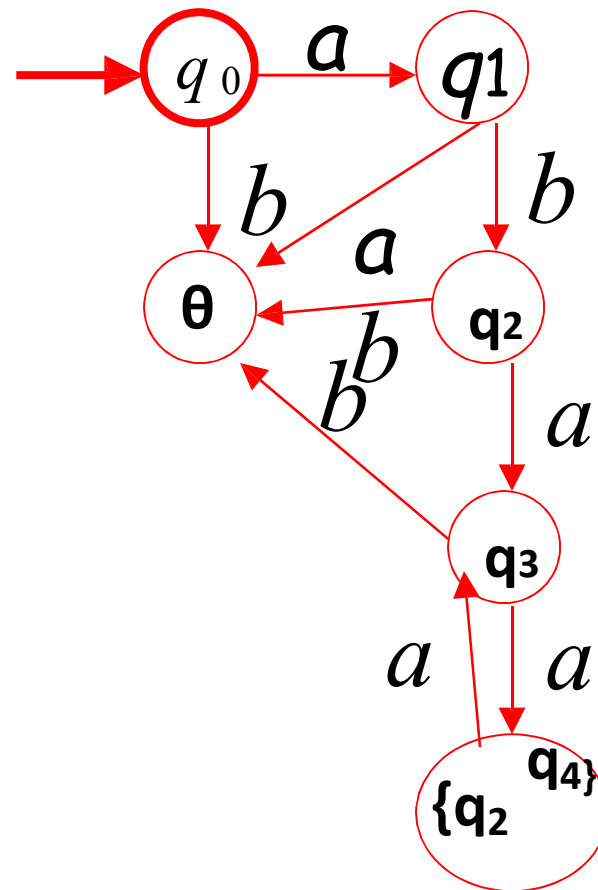
$$\delta(\{q_2, q_4\}, a) = ??$$

Jabarkan :

$$\delta(\{q_2\}, a) = q_3$$

$$\delta(\{q_4\}, a) = \theta$$

$$\begin{aligned} \delta(\{q_2, q_4\}, a) &= q_3 \cup \theta \\ &= q_3 \end{aligned}$$



langkah 2

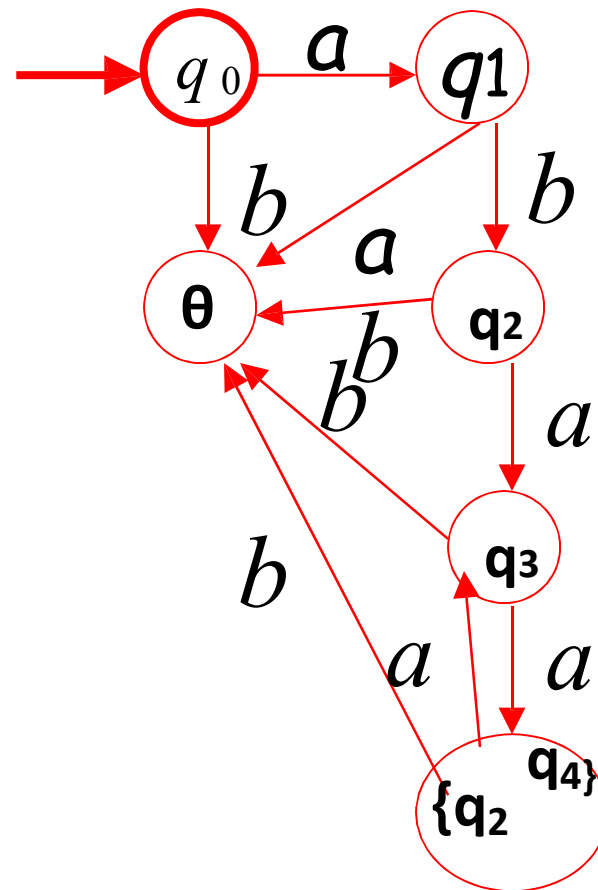
$$\delta(\{q_2, q_4\}, b) = ??$$

Jabarkan :

$$\delta(\{q_2\}, b) = \theta$$

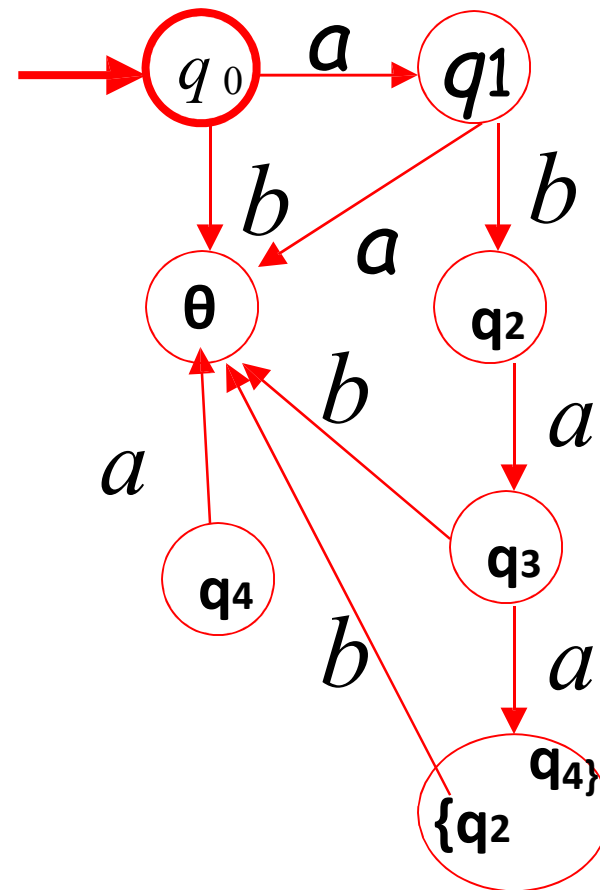
$$\delta(\{q_4\}, b) = \theta$$

$$\begin{aligned}\delta(\{q_2, q_4\}, b) &= \theta \cup \theta \\ &= \theta\end{aligned}$$



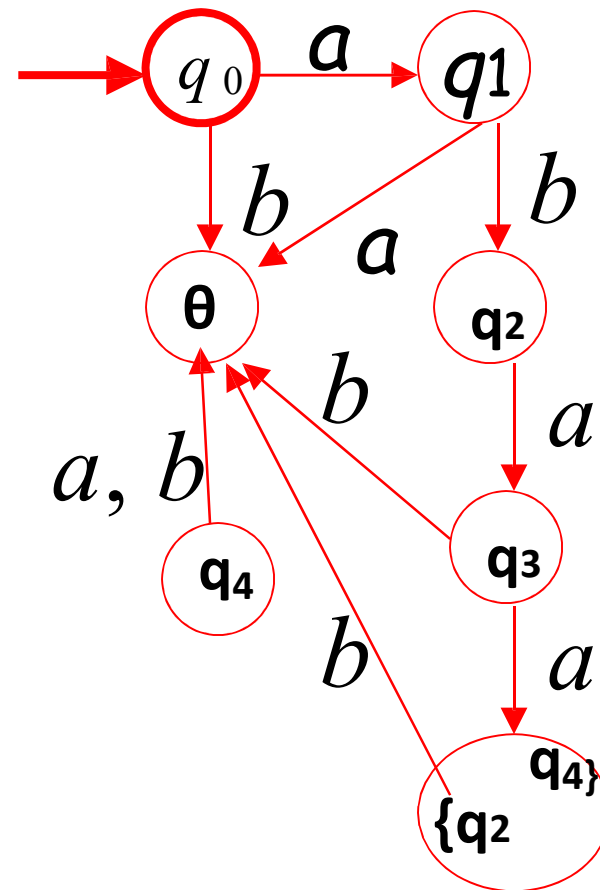
langkah 2

$$\delta(q_4, a) = \theta$$



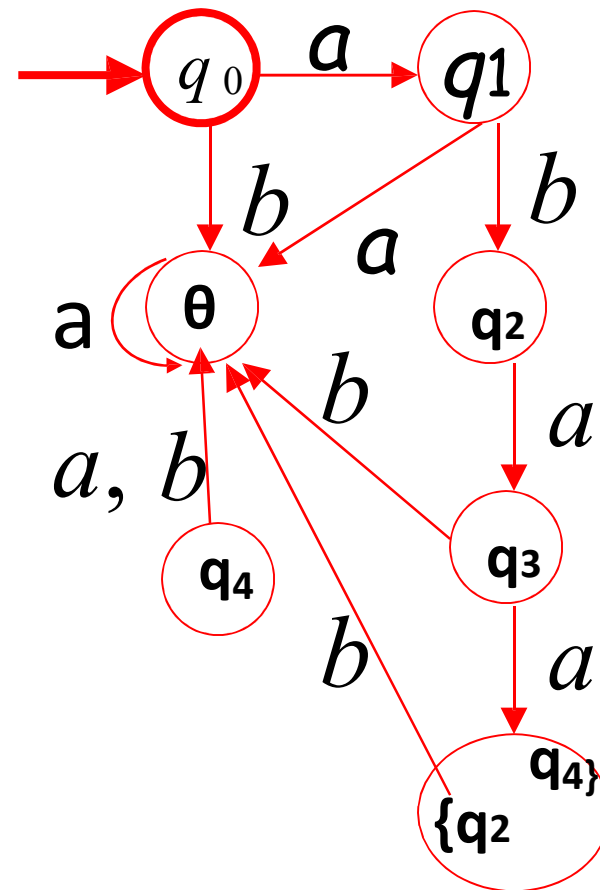
langkah 2

$$\delta(q_4, b) = \theta$$



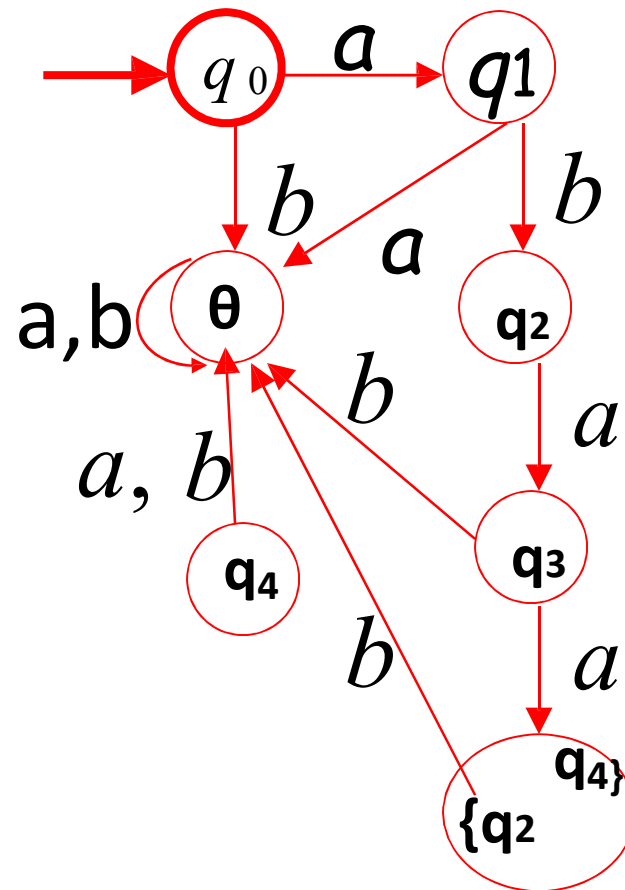
langkah 2

$$\delta(\theta, a) = \theta$$



langkah 2

$$\delta(\theta, b) = \theta$$

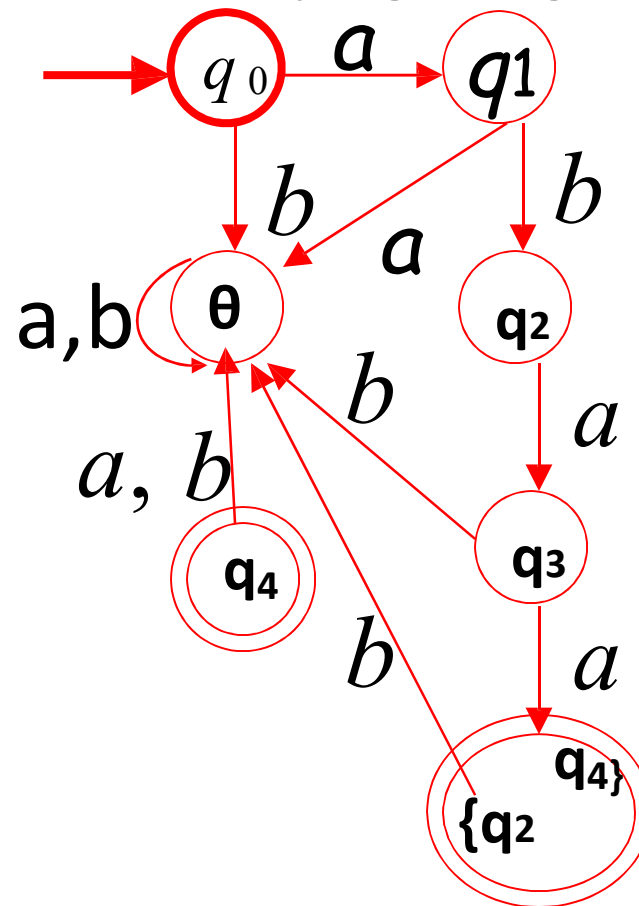


langkah 3

menentukan state akhir

FSA mesin 4 $F=q_4$ maka

Ekivalensi FSA Ke DFA = Semua state yang mengandung state akhir yaitu q_4



Hasil ekivalensi NFA mesin 4 ke DFA

