

# Latihan Ekuivalensi NFA-DFA

## Soal 1-3

### Soal 1

Misalkan diberikan NFA sebagai berikut:

- States:  $\{q_0, q_1, q_2\}$
- Alphabet:  $\{a, b\}$
- Start state:  $q_0$
- Accept states:  $\{q_2\}$
- Transition function:

$$\delta(q_0, a) = \{q_0, q_1\}, \quad \delta(q_0, b) = \{q_0\}, \quad \delta(q_1, b) = \{q_2\}, \quad \delta(q_2, a) = \emptyset, \quad \delta(q_2, b) = \emptyset$$

#### Konversi ke DFA:

Mulai dengan state awal DFA adalah  $\{q_0\}$  (subset awal).

Tabel transisi DFA:

DFA State	$a$	$b$	Accept State?
$\{q_0\}$	$\{q_0, q_1\}$	$\{q_0\}$	Tidak
$\{q_0, q_1\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$	Tidak
$\{q_0, q_2\}$	$\{q_0, q_1\}$	$\{q_0\}$	Ya (karena ada $q_2$ )

Semua state lain yang muncul sudah tercakup pada tabel di atas.

### Soal 2

Misalkan NFA diberikan sebagai berikut:

- States:  $\{p_0, p_1\}$
- Alphabet:  $\{0, 1\}$
- Start state:  $p_0$
- Accept states:  $\{p_1\}$

- Transition:

$$\delta(p_0, 0) = \{p_0, p_1\}, \quad \delta(p_0, 1) = \{p_0\}, \quad \delta(p_1, 0) = \emptyset, \quad \delta(p_1, 1) = \emptyset$$

**Konversi ke DFA:**

State awal DFA:  $\{p_0\}$ .

Tabel transisi DFA:

DFA State	0	1	Accept State?
$\{p_0\}$	$\{p_0, p_1\}$	$\{p_0\}$	Tidak
$\{p_0, p_1\}$	$\{p_0, p_1\}$	$\{p_0\}$	Ya (karena $p_1$ )

—

## Soal 3

Misalkan NFA berikut:

- States:  $\{r_0, r_1, r_2\}$
- Alphabet:  $\{x, y\}$
- Start state:  $r_0$
- Accept states:  $\{r_2\}$
- Transition:

$$\delta(r_0, x) = \{r_1\}, \quad \delta(r_1, y) = \{r_2\}, \quad \delta(r_2, x) = \emptyset, \quad \delta(r_2, y) = \emptyset$$

**Konversi ke DFA:**

State awal DFA:  $\{r_0\}$ .

Tabel transisi DFA:

DFA State	$x$	$y$	Accept State?
$\{r_0\}$	$\{r_1\}$	$\emptyset$	Tidak
$\{r_1\}$	$\emptyset$	$\{r_2\}$	Tidak
$\{r_2\}$	$\emptyset$	$\emptyset$	Ya