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Kelas : TI 4 B/L B

No
Date

1. Diketahui bahasa kontekstual G dgn aturan produksi sbb:

$S \rightarrow abAB \mid C$
$A \rightarrow bAB \mid \varepsilon$
$C \rightarrow B \mid \varepsilon$
$B \rightarrow BAa \mid A \mid \varepsilon$

Hilangkan produksi ε, menjadi:

$S \rightarrow abAB \mid abA \mid abB \mid ab \mid C$
$A \rightarrow bAB \mid bA \mid bB \mid b$
$C \rightarrow B$
$B \rightarrow BAa \mid Ba \mid Aa \mid a \mid A$

Hilangkan produksi unit, sehingga menjadi:

$S \rightarrow abAB \mid abA \mid abB \mid ab \mid BAa \mid Ba \mid Aa \mid a \mid bAB \mid bA \mid bB \mid b$
$A \rightarrow bAB \mid bA \mid bB \mid b$
$C \rightarrow BAa \mid Ba \mid Aa \mid a \mid bAB \mid bA \mid bB \mid b$
$B \rightarrow BAa \mid Ba \mid Aa \mid a \mid bAB \mid bA \mid bB \mid b$

Hilangkan produksi useless, sehingga hasil akhir:

$S \rightarrow abAB \mid abA \mid abB \mid ab \mid BAa \mid Ba \mid Aa \mid a \mid bAB \mid bA \mid bB \mid b$
$A \rightarrow bAB \mid bA \mid bB \mid b$
$B \rightarrow BAa \mid Ba \mid Aa \mid a \mid bAB \mid bA \mid bB \mid b$

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2.) Dik : NFA $(Q, \Sigma, \delta, S, F)$

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

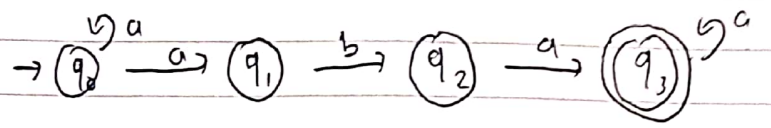
$\Sigma = \{a, b\}$

$S = q_0$

$F = \{q_3\}$

δ	a	b
q_0	$\{q_0, q_1\}$	$\emptyset$
q_1	$\emptyset$	$\{q_2\}$
q_2	$\{q_3\}$	$\emptyset$
q_3	$\{q_3\}$	$\emptyset$

a.) Gambar graf NFA



b) Buat 5 string diterima :

1.) a b a
↳ $\delta(q_0, aba) = \delta(q_1, ba) = \delta(q_2, a) = q_3 \in F$

2.) a a b a
↳ $\delta(q_0, aaba) = \delta(q_0, aba) = \delta(q_1, ba) = \delta(q_2, a) = q_3 \in F$

3.) a a a b a
↳ $\delta(q_0, aaaba) = \delta(q_0, aaba) = \delta\{q_0, aaba) = \delta(q_1, ba) = \delta(q_2, a)$
$= q_3 \in F$

4.) a b a a
↳ $\delta(q_0, abaa) = \delta(q_1, baa) = \delta(q_2, aa) = \delta(q_3, a) = \delta\, q_3 \in F$

5.) a b a a a
↳ $\delta(q_0, abaaa) = \delta(q_1, baaa) = \delta(q_2, aaa) = \delta(q_3, aa) = \delta(q_3, a) = q_3 \in F$

Buat 5 String ditolak :

1.) a a
↳ $\delta(q_0, aa) = \delta(q_0, a) = q_1 \notin F$

2.) a a b
↳ $\delta(q_0, aab) = \delta(q_0, ab) = \delta(q_1, b) = q_2 \notin F$

3.) a
↳ $\delta(q_0, a) = q_1 \notin F$

4.) a a a b
↳ $\delta(q_0, aaab) = \delta(q_0, aab) = \delta(q_0, ab) = \delta(q_1, b) = q_2 \notin F$

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5.) aaa

↳ $\delta(q_0, aaa) = \delta(q_0, aa) = \delta(q_0, a) = q_1 \notin F$

c. Tent. bahasa yg dihenali NFA diatas (ciri ? Sering).

↳ ciri-ciri sering nya adalah diawali dengan input 'a' dan diakhiri dengan input 'a' dengan input 'b' pada state q_1 ke q_2. Dengan pola $\{A^n b A^m \mid n \geq 1$ dan $m \geq 1\}$

3.) Diket : NFA $(Q, \Sigma, \delta, S, F)$

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

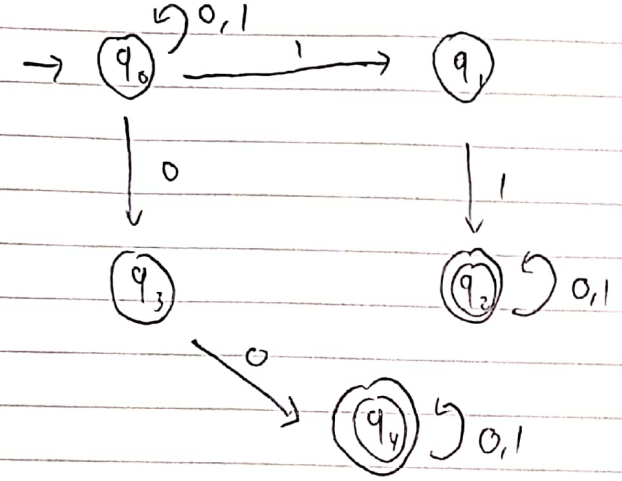
$\Sigma = \{0, 1\}$

$S = q_0$

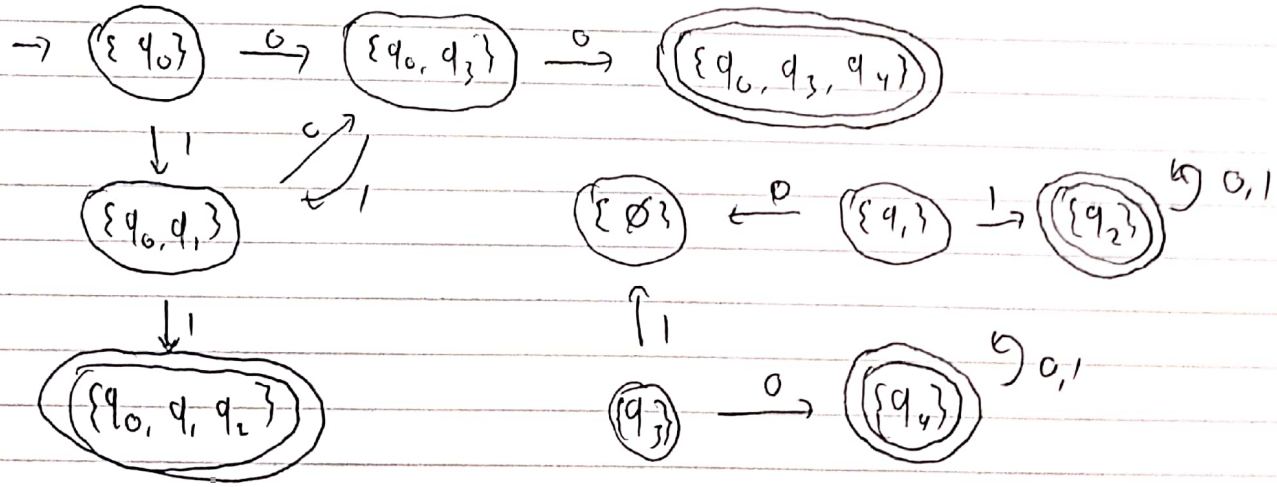
$F = \{q_2, q_4\}$

δ	0	1
q_0	$\{q_0 q_3\}$	$\{q_0, q_1\}$
q_1	$\emptyset$	$\{q_2\}$
q_2	$\{q_2\}$	$\{q_2\}$
q_3	$\{q_4\}$	$\emptyset$
q_4	$\{q_4\}$	$\{q_4\}$

a.) Gambar graf NFA

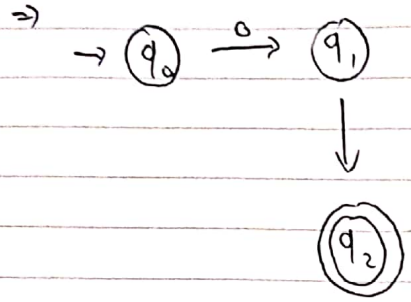


b.) DFA

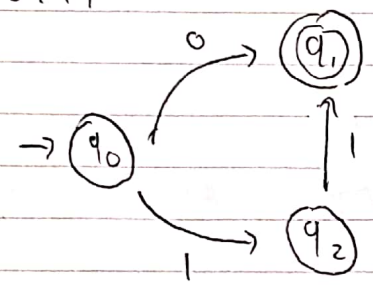


$\{q_0, q_3, 0\}$	$\{q_0, q_1, 0\}$
$\{q_0, 0\} = \{q_0, q_3\}$	$\{q_0, 0\} = \{q_0, q_3\}$
$\{q_3, 0\} = \{q_4\}$	$\{q_1, 0\} = \{\emptyset\}$
$\{q_0, q_3, 1\}$	$\{q_0, q_1, 1\}$
$\{q_0, 1\} = \{q_0, q_1\}$	$\{q_0, 1\} = \{q_0, q_1\}$
$\{q_3, 1\} = \emptyset$	$\{q_1, 1\} = \{q_2\}$

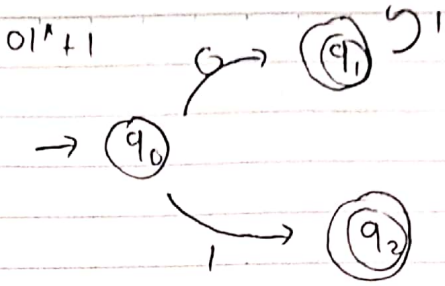
4. a.) 01



b.) 0+11



c.) 01*+1



d.) (0+1*)*

5. Selain String dari ER ((a+b)* b (a+ab)*)

1.) b
2.) bb
3.) ab
4.) ba
5.) bbb
6.) aab
7.) bab
8.) baa
9.) abb
10.) aba
11.) bba