

PR 1 TBFO

Erdianti Wiga P

13522053

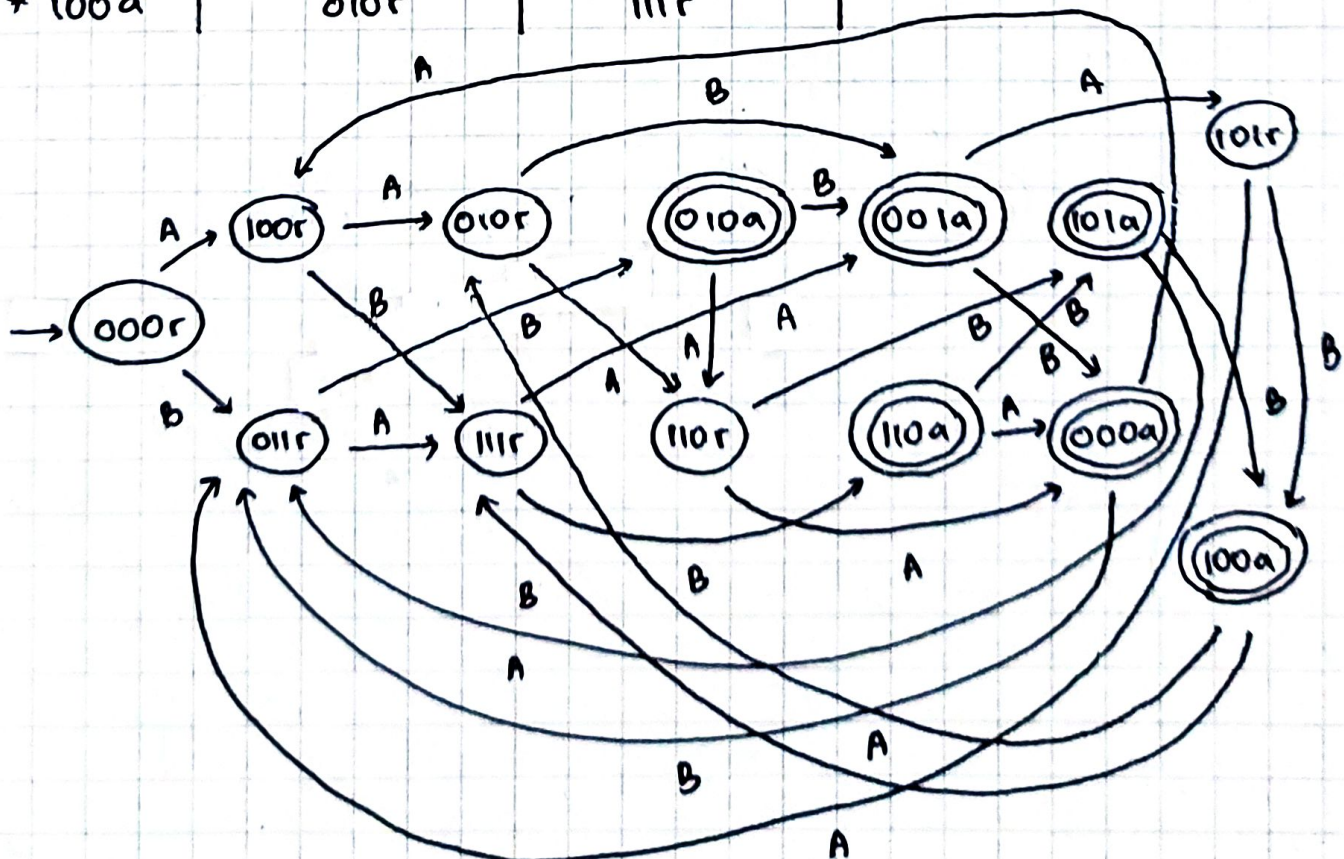
K-01

Exercise 2.2.1

a) drop di D → accepted
drop di C → rejected

Kiri → 0
Kanan → 1

	A	B
→ 000r	100r	011r
100r	010r	111r
011r	111r	010a
010r	110r	001a
111r	001a	110a
* 010a	110r	001a
110r	000a	101a
* 001a	101r	000a
* 110a	000a	101a
* 101a	011r	100a
* 000a	100r	011r
101r	011r	100a
* 100a	010r	111r



Exercise 2.2.1

b) Informally describe the language of automaton

- 1) 'a' menjelaskan kondisi accepted \rightarrow kelereng jatuh di D
- 2) 'r' menjelaskan kondisi rejected \rightarrow kelereng jatuh di C
- 3) 'o' menjelaskan kelereng jatuh ke kiri
- 4) 'i' menjelaskan kelereng jatuh ke kanan

$Q = \{000r, 100r, 011r, 010r, 111r, 010a, 110r, 001a, 110a, 101a, 000a, 101r, 100a\} \rightarrow \text{states}$

$Z = \{A, B\} \rightarrow \text{input}$

$q_0 = 000r \rightarrow \text{initial state}$

$F = \{010a, 001a, 110a, 101a, 000a, 100a\} \rightarrow \text{final states}$

$\delta = Q \times Z \rightarrow Q$ (semua di tabel)

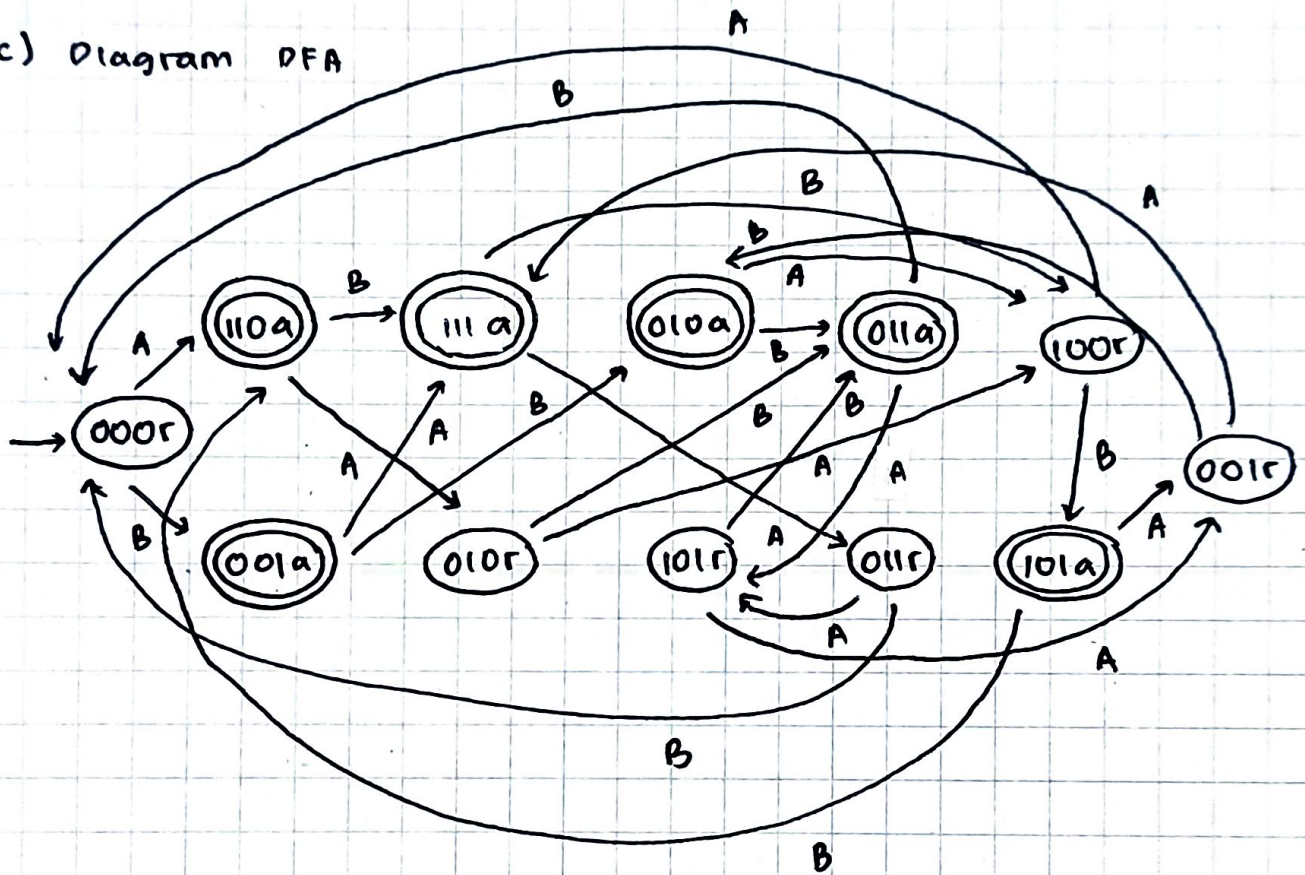
c) levers switched before marble pass. Jawaban (a) & (b) akan berubah karna state akan berubah shg hasil input A, B pd tiap state akan berubah.

Tabel transisinya menjadi:

	A	B
$\rightarrow 000r$	110a	001a
* 110a	010r	111a
* 001a	111a	010a
010r	100r	011a
* 111a	011r	100r
* 010a	100r	011a
101r	001r	110a
* 011a	101r	000r
011r	101r	000r
100r	000r	101a
* 101a	001r	110a
001r	111a	010a

Exercise 2.2.1

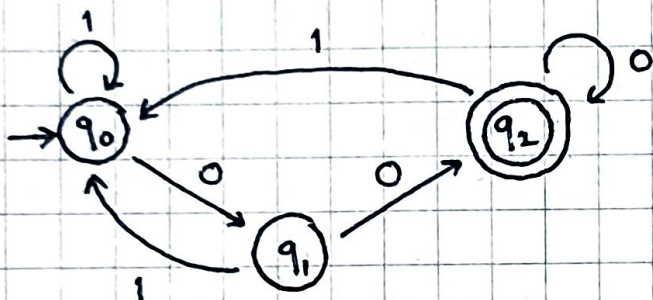
c) Diagram DFA



Exercise 2.2.1

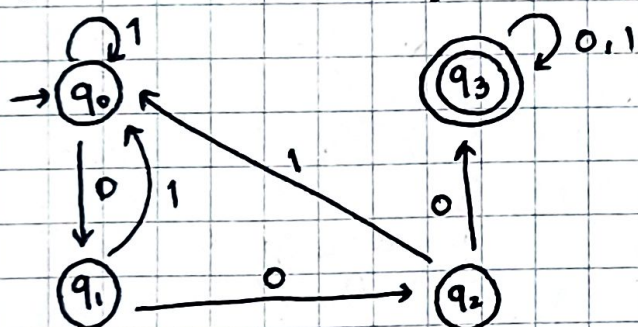
$$\Sigma = \{0, 1\}$$

a) $L = \{\text{set of all strings ending in } 00\}$



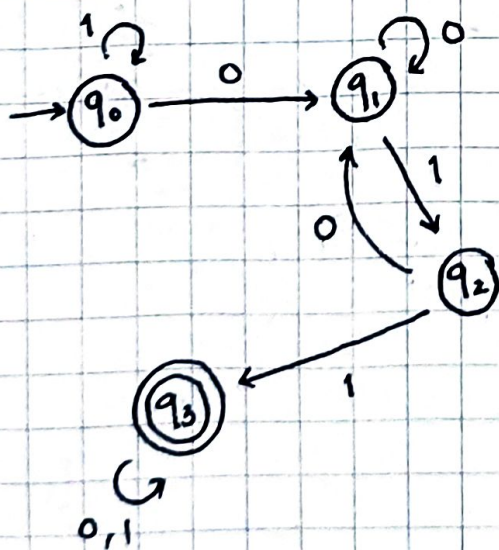
	0	1
→ q ₀	q ₁	q ₀
q ₁	q ₂	q ₀
* q ₂	q ₂	q ₀

b) $L = \{\text{set of all strings with 3 consecutive 0's}\}$



	0	1
→ q ₀	q ₁	q ₀
q ₁	q ₂	q ₀
q ₂	q ₃	q ₀
* q ₃	q ₃	q ₃

c) $L = \{\text{set of strings with 011 as a substring}\}$

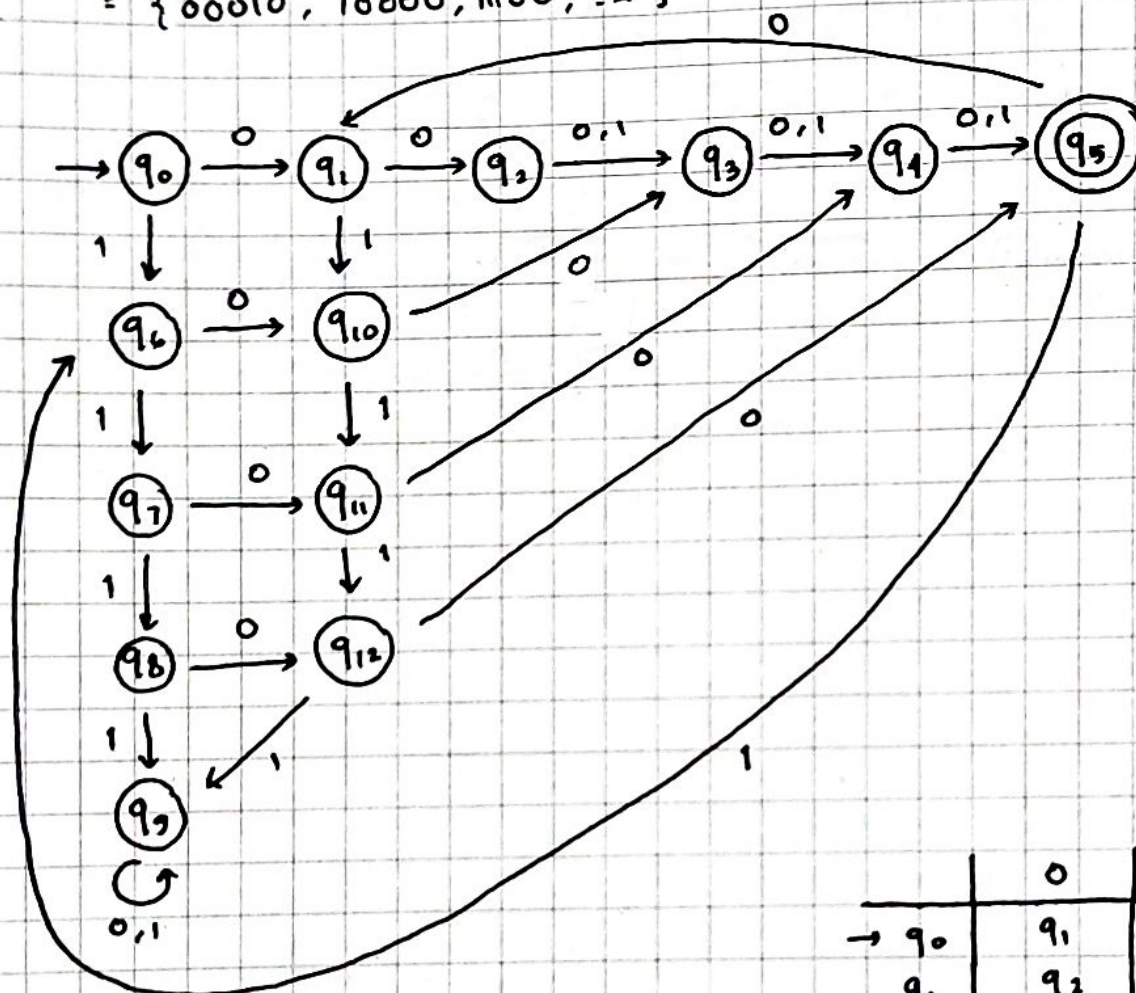


	0	1
→ q ₀	q ₁	q ₀
q ₁	q ₁	q ₂
q ₂	q ₁	q ₃
* q ₃	q ₃	q ₃

Exercise 2.2.5

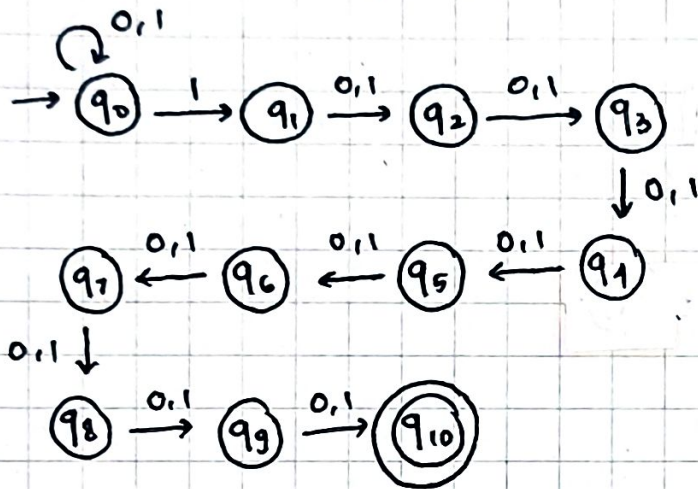
$$\Sigma = \{0, 1\}$$

- a) $L = \{ \text{set of all strings that each block of five consecutive symbols contains at least two '0's'} \}$
 $= \{00010, 10000, 11100, \dots\}$



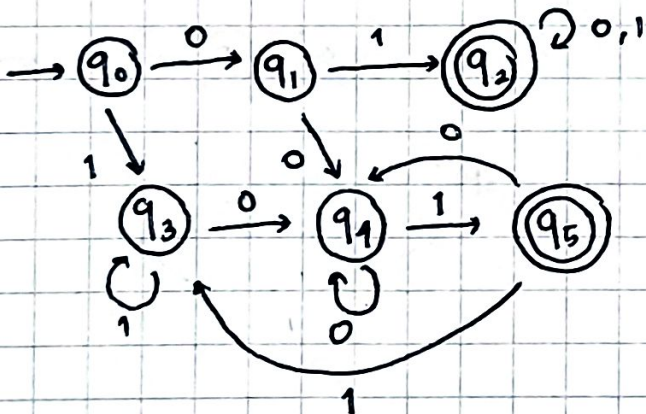
	0	1
→ q ₀	q ₁	q ₆
q ₁	q ₂	q ₁₀
q ₂	q ₃	q ₃
q ₃	q ₄	q ₄
q ₄	q ₅	q ₅
* q ₅	q ₁	q ₆
q ₆	q ₁₀	q ₇
q ₇	q ₁₁	q ₈
q ₈	q ₁₂	q ₉
q ₉	q ₀	q ₉
q ₁₀	q ₃	q ₁₁
q ₁₁	q ₄	q ₁₂
q ₁₂	q ₅	q ₉

b) $L = \{ \text{set of all strings whose tenth symbol from the right end is a 1} \}$ (NFA)



	0	1
q_0	q_0	$\{q_0, q_1\}$
q_1	q_2	q_2
q_2	q_3	q_3
q_3	q_4	q_4
q_4	q_5	q_5
q_5	q_6	q_6
q_6	q_7	q_7
q_7	q_8	q_8
q_8	q_9	q_9
q_9	q_{10}	q_{10}
q_{10}	\emptyset	\emptyset

c) $L = \{ \text{set of all strings that either begin or end (or both) with 01} \}$



	0	1
$\rightarrow q_0$	q_1	q_3
q_1	q_4	q_2
$*q_2$	q_2	q_2
q_3	q_1	q_3
q_4	q_4	q_5
$*q_5$	q_1	q_3

d) $L = \{ \text{set of strings such that the number of 0's is divisible by five, \& the number of 1's is divisible by 3} \}$

$a = \text{JMI '1'}$
 $b = \text{JMI '0'}$

$q_0 = \text{initial state} \rightarrow a \bmod 3 = 0$
 $b \bmod 5 = 0$

$$\left. \begin{array}{l} q_0 = a \bmod 3 = 0 \\ q_1 = a \bmod 3 = 1 \\ q_2 = a \bmod 3 = 2 \end{array} \right\} b \bmod 5 = 0$$

$$\left. \begin{array}{l} q_3 = a \bmod 3 = 0 \\ q_4 = a \bmod 3 = 1 \\ q_5 = a \bmod 3 = 2 \end{array} \right\} b \bmod 5 = 1$$

$$\left. \begin{array}{l} q_6 = a \bmod 3 = 0 \\ q_7 = a \bmod 3 = 1 \\ q_8 = a \bmod 3 = 2 \end{array} \right\} b \bmod 5 = 2$$

$$\left. \begin{array}{l} q_9 = a \bmod 3 = 0 \\ q_{10} = a \bmod 3 = 1 \\ q_{11} = a \bmod 3 = 2 \end{array} \right\} b \bmod 5 = 3$$

$$\left. \begin{array}{l} q_{12} = a \bmod 3 = 0 \\ q_{13} = a \bmod 3 = 1 \\ q_{14} = a \bmod 3 = 2 \end{array} \right\} b \bmod 5 = 4$$

