

PR-10 TBFO

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Ex. 8.2.1

State	SYMBOL				
	0	1	X	Y	B
q_0	(q_1, X, R)	-	-	(q_2, Y, R)	-
q_1	$(q_1, 0, R)$	(q_2, Y, L)	-	(q_1, Y, R)	-
q_2	$(q_2, 0, L)$	-	(q_0, X, R)	(q_2, Y, L)	-
q_3	-	-	-	(q_3, Y, R)	(q_4, B, R)
q_4	-	-	-	-	-

a.) 00

$$[q_0]_{00} \vdash x[q_1]_0 + x^0[q_1]$$

b.) 000111

$$\begin{aligned} & [q_0]000111 \vdash x[q_1]00111 \vdash x0[q_1]0111 \vdash x00[q_1]111 \vdash x0[q_2]0Y111 \vdash \\ & x[q_2]00Y11 \vdash [q_2]x00Y11 \vdash x[q_0]00Y11 \vdash xx[q_1]0Y11 \vdash xx0[q_1]Y11 \\ & \vdash xx0Y[q_1]11 \vdash xx0[q_2]YY1 \vdash xx[q_2]0YY1 \vdash x[q_2]x0YY1 \vdash \\ & xx[q_0]0YY1 \vdash xxx[q_1]YY1 \vdash xxxY[q_1]Y1 \vdash xxxYY[q_1]1 \vdash \\ & xxxY[q_2]YY \vdash xxx[q_2]YY \vdash xx[q_2]xYYY \vdash xxx[q_0]YYY \vdash \\ & xxxY[q_3]YY \vdash xxxYY[q_3]Y \vdash xxxYYY[q_3] \vdash xxxYYYB[q_4] \end{aligned}$$

c.) 00111

$$\begin{aligned} & \vdash x[q_0]00111 \vdash x[q_1]0111 \vdash x0[q_1]111 \vdash x[q_2]0Y11 \vdash [q_2]x0Y11 \\ & \vdash x[q_0]0Y11 \vdash xx[q_1]Y11 \vdash xxY[q_1]11 \vdash xx[q_2]YY1 \\ & \vdash x[q_2]xYY1 \vdash xx[q_0]YY1 \vdash xxY[q_3]Y1 \vdash xxYYq_31 \end{aligned}$$

Ex. 8.2.2. a.) Set of strings with an equal number of 0's and 1's

State	0	1	B	X	Y
q_0	(q_2, X, R)	(q_1, X, R)	(q_f, B, R)	-	(q_0, Y, R)
q_1	(q_3, Y, R)	$(q_1, 1, R)$	-	-	(q_1, Y, R)
q_2	$(q_2, 0, R)$	(q_3, Y, L)	-	-	(q_2, Y, R)
q_3	$(q_3, 0, L)$	$(q_3, 1, L)$	-	(q_0, X, R)	(q_3, Y, L)
q_f	-	-	-	-	-

q_0 : State awal
 q_1 : State bertemu
 0 single
 q_2 : State bertemu
 1 single
 q_3 : State bertemu
 Pasangan 0 - 1
 q_f : final state

b) $\{a^n b^n c^n \mid n \geq 1\}$

State	a	b	c	B
q_0	(q_1, a, R)	-	-	-
q_1	(q_1, a, R)	(q_2, b, R)	-	-
q_2	-	(q_2, b, R)	(q_3, c, R)	-
q_3	-	-	(q_3, c, R)	(q_f, B, R)
q_f	-	-	-	-

$q_0 \rightarrow \text{start}$
 $q_1 \rightarrow \text{Saat bertemu a}$
 $q_2 \rightarrow \text{Saat bertemu b}$
 $q_3 \rightarrow \text{Saat bertemu c}$
 $q_f \rightarrow \text{final state}$

c. $\{ww^R \mid w \text{ is any string of 0's and 1's}\}$

State	0	1	x	y	B
q_0	(q_1, x, R)	(q_2, x, R)	-	(q_0, y, R)	(q_4, B, R)
q_1	$(q_1, 0, R)$	$(q_1, 1, R)$	-	(q_3, y, L)	(q_3, B, L)
q_2	$(q_2, 0, R)$	$(q_2, 1, R)$	-	(q_4, y, L)	(q_4, B, L)
q_3	(q_5, y, L)	-	-	-	-
q_4	-	(q_5, y, L)	-	-	-
q_5	$(q_5, 0, L)$	$(q_3, 1, L)$	(q_0, x, R)	-	-
q_f	-	-	-	-	-

$q_0 \rightarrow \text{start}$
 $q_1 \rightarrow 0 \text{ di awal}$
 $q_2 \rightarrow 1 \text{ di awal}$
 $q_3 \rightarrow 0 \text{ di akhir}$
 $q_4 \rightarrow 1 \text{ di akhir}$
 $q_5 \rightarrow \text{skip "x"}$
 $q_f \rightarrow \text{final state}$