PR 5 TBFO

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Exercise 4.1.1

a) Suppose L is a reg language & k is pumping lemma constant
$w = 0^n 1^n$, $n \geq 1$
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists only 0's
↳ for $k = 0$, xz must be in L, but xz consists of fewer than n 0's & followed by n 1's, therefore $xz \notin L$
∴ L not regular language

b) Suppose L is a reg language & k is pumping lemma constant
$w = "("^n ")"^n$
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists only "(" 's
↳ For $k > 0$, xz must be in L, but xz consists of fewer than n "(" 's & followed by n ")" 's, therefore $xz \notin L$
∴ L not regular language

c) Suppose L is a reg language & k is pumping lemma constant
$w = 0^n 1^n$, $n > 1$
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists only 0's
↳ for $k = 0$, xz must be in L, but xz consists of fewer than n 0's, followed by 1 and n 0's, therefore $xz \notin L$
∴ L is not regular language

d) Suppose L is a reg language, $w = 0^n 1^m 2^n$, m & n are arbitrary integers
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists of only 0's
↳ for $k = 0$, xz must be in L, but xz consists of fewer than n 0's followed by m 1's and n 2's, therefore $xz \notin L$
∴ L is not regular language

e) Suppose L is a reg language, $w = 0^n 1^m$; $n \leq m$
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists only 0's
↳ For $k = n$, $xy^m z$ must be in L, but $xy^m z$ consists of more than m 0's & m 1's, therefore $xy^m z \notin L$
∴ L is not regular language

f) Suppose L is a reg language, $w = 0^n 1^{2n}$; $n \geq 1$
↳ for $w = xyz$, $|xy| \leq n$, therefore y consists only 0's
↳ For $k = 0$, xz must be in L, but xz consists of fewer than n 0's & followed by 2n 1's, therefore $xz \notin L$
∴ L is not regular language.

Exercise 4.4.1

Table DFA to be minimized

	0	1
→ A	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D

a) Draw the table of distinguishabilities for this automaton

B	x						
C	x	x					
D	x	x	x				
E	x	x	•	x			
F	x	•	x	x	x		
G	•	x	x	x	x	x	
H	x	x	x	x	x	x	x
	A	B	C	D	E	F	G

G 0 Equivalence
{A, B, C, E, F, G, H}, {D}

G 1 Equivalence
{A, B, F, G}, {C, E}, {H}, {D}

G 2 Equivalence
{A, G}, {B, F}, {C, E}, {H}, {D}

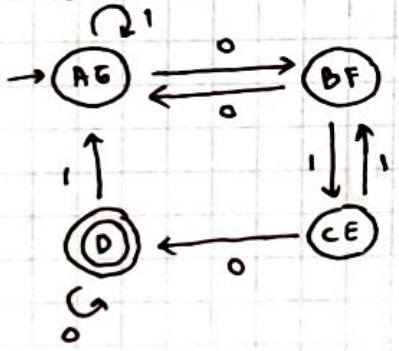
G 3 Equivalence
{A, G}, {B, F}, {C, E}, {H}, {D}

Lanjutan Exercise 4.4.1

b) Construct the minimum-state equivalent DFA

	0	1
→ AG	BF	AG
BF	AG	CE
CE	D	BF
*D	D	AG

Diagram transisi



Exercise 4.4.2

Table DFA to be minimized

	0	1
→ A	B	E
B	C	F
*C	D	H
D	E	H
E	F	I
*F	G	B
G	H	B
H	I	C
*I	A	E

a) Draw the table of distinguishabilities for the automaton

B	x							
C	x	x						
D	·	x	x					
E	x	·	x	x				
F	x	x	·	x	x			
G	·	x	x	·	x	x		
H	x	·	x	x	·	x	x	
I	x	x	·	x	x	·	x	x
	A	B	C	D	E	F	G	H

0 Equivalence
{A, B, D, E, G, H}, {C, F, I}

1 Equivalence
{A, D, G}, {B, E, H}, {C, F, I}

2 Equivalence
{A, D, G}, {B, E, H}, {C, F, I}

b) Construct the minimum-state equivalent DFA

	0	1
→ ADG	BEH	BEH
BEH	CFI	CFI
*CFI	ADG	BEH