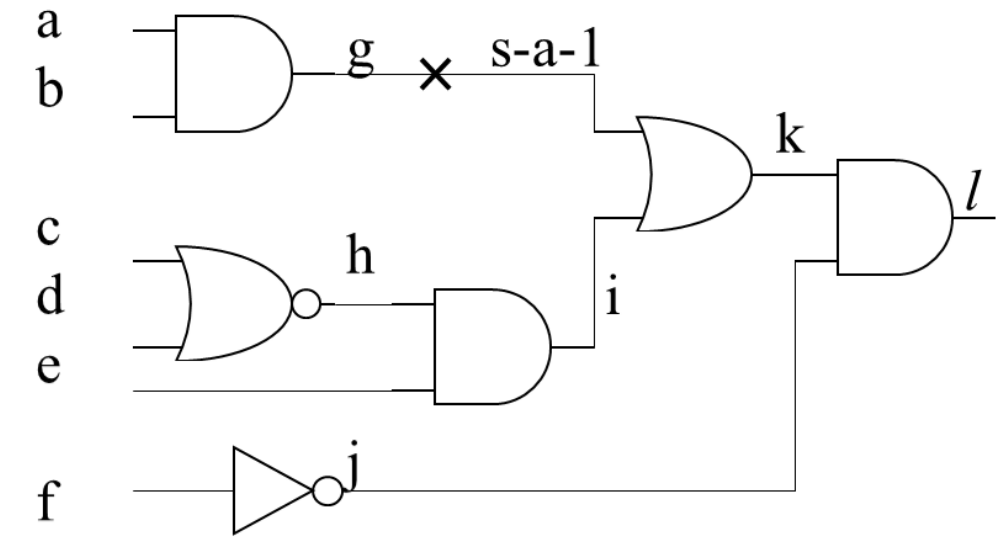
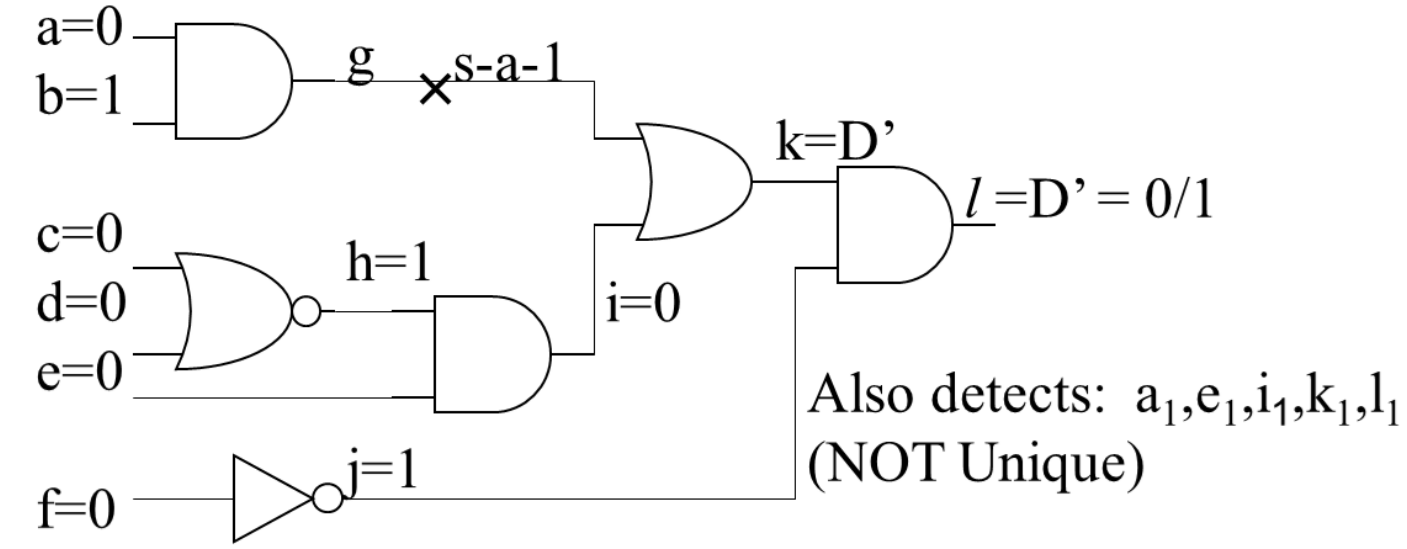
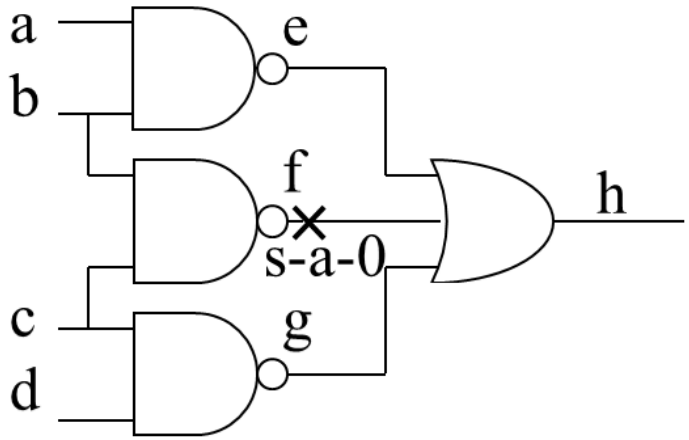
6.1 – Generate a test for g s-a-1. List all other faults detected.





6.3 – Use only implications to show that the fault f s-a-0 is undetectable.



SOLUTION:

f s-a-0 requires f=1 (activation)
Unique D-drive thru h implies e=0, and g=0
e=0 implies a=b=1
g=0 implies c=d=1
b=1 and c=1 implies f=0 (CONTRADICTION)

6.4 – Construct a 5-value truth table for a 2-input XOR gate.

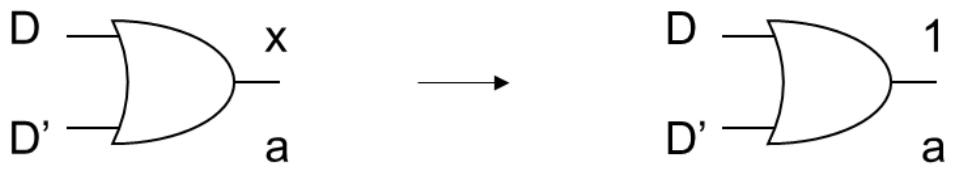
XOR	0	1	D	D’	x
0	0	1	D	D’	X
1	1	0	D’	D	X
D	D	D’	0	1	X
D’	D’	D	1	0	X
X	X	X	X	X	X

6.5 – Can a gate on the D-frontier have bothD and D' among its input values?

SOLUTION:

YES. However, it will not propagate to the gate output.

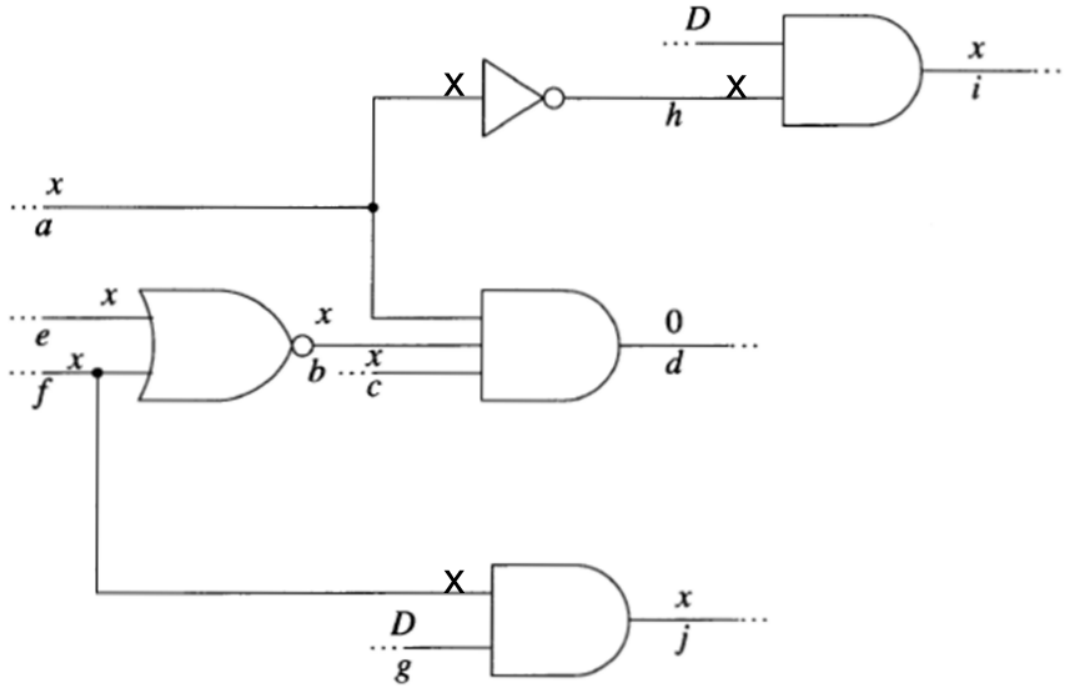
For example:



D-Frontier = {…,a}

D-Frontier = {…}

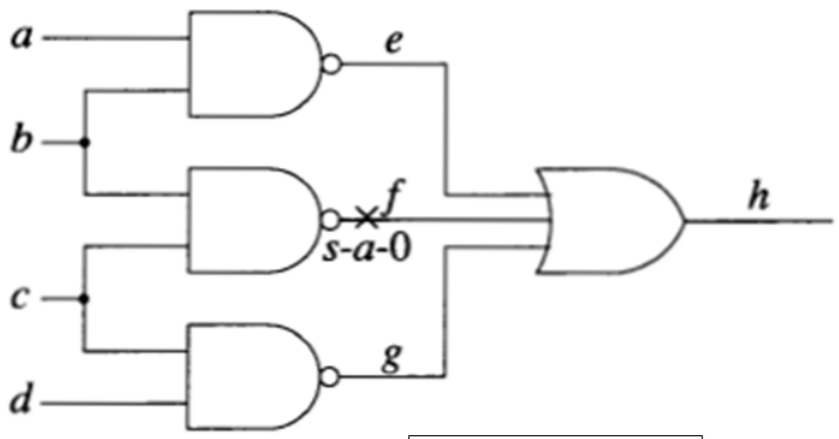
6.8 – Assume that trying to justify d=0 via a=0 failed as a result of an inconsistency. Reverse the decision and perform all implications.



Objective	Assignment	Action	Implication
d=0	a=0	conflict, backtrack	d=0, h=1
d=0	a=1, c=0	objective is met	h=0, i=0

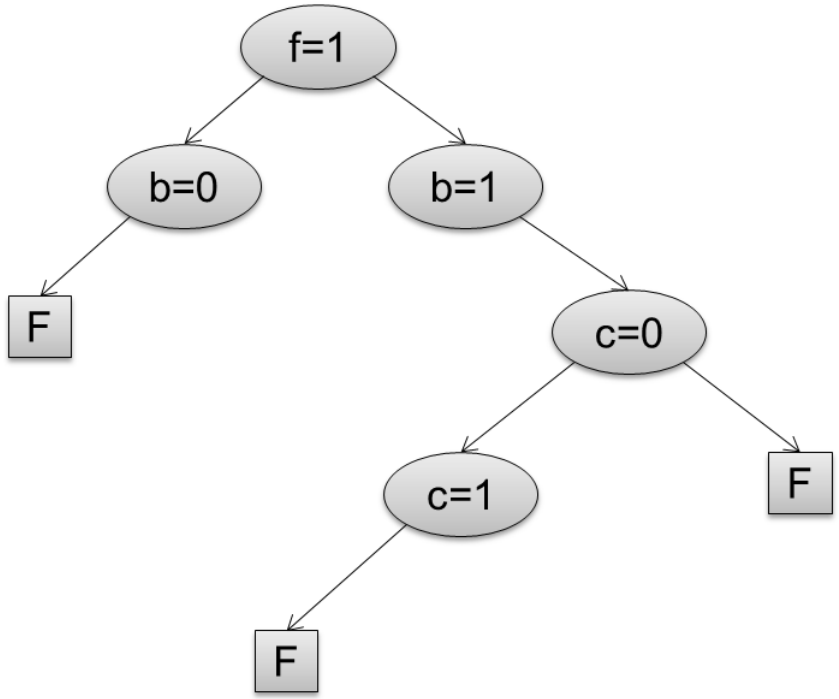
i.e. pick another input

6.12 – Apply PODEM to:

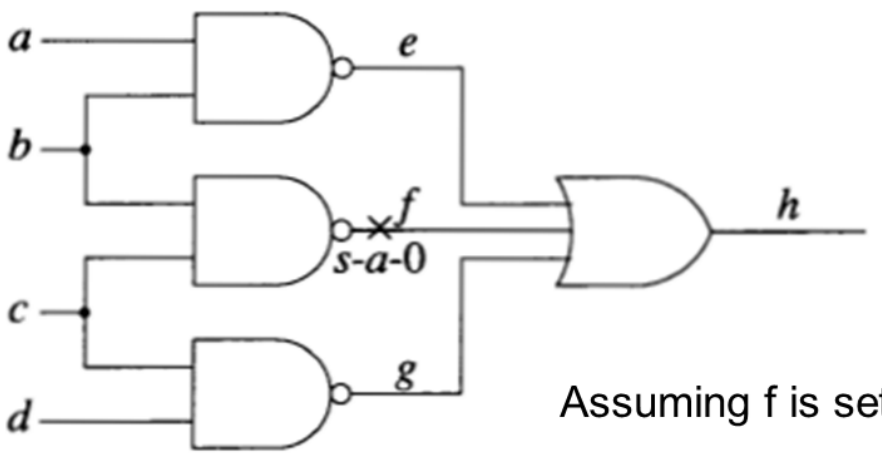


objective	f=1
backtrace to PI	Set b=0
imply	Failure (e=1 ➡ h=1) X
reverse decision	Set b=1
backtrace to PI	Set c=0
imply	Failure (g=1 ➡ h=1) X
reverse decision	Set c=1
imply	Failure f=0 X

Decision Tree



6.12 – Apply PODEM to:

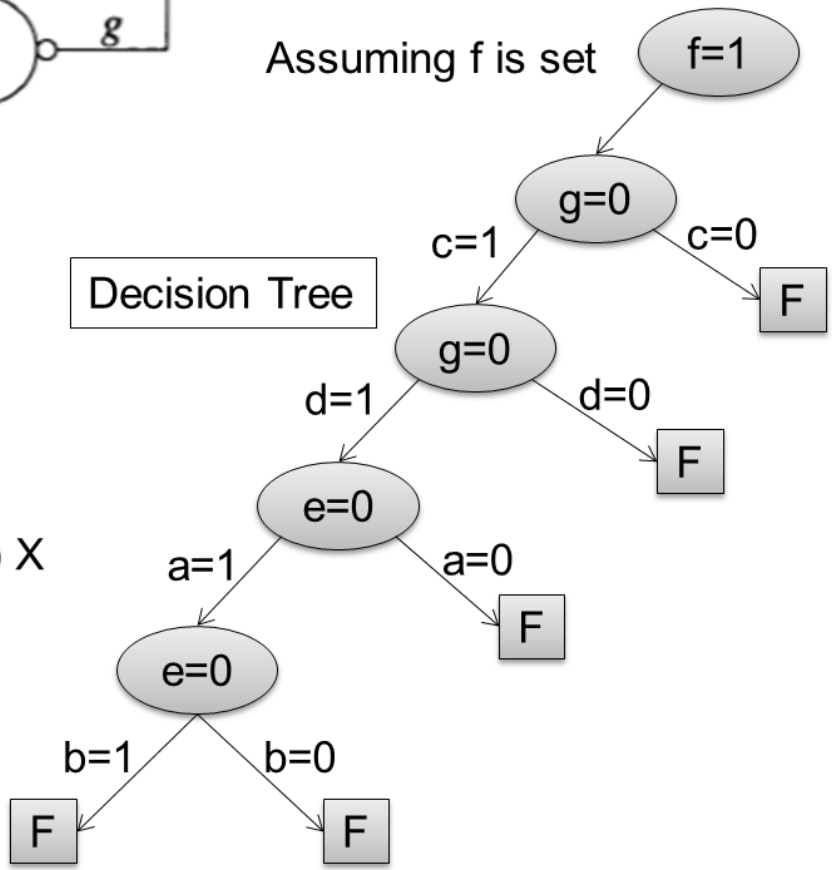


objective	f=1
objective	g=0
assign	c=1
assign	d=1
objective	e=0
assign	a=1
assign	b=1 ➡ Failure (b,c=1,1 ➡ f=0) X

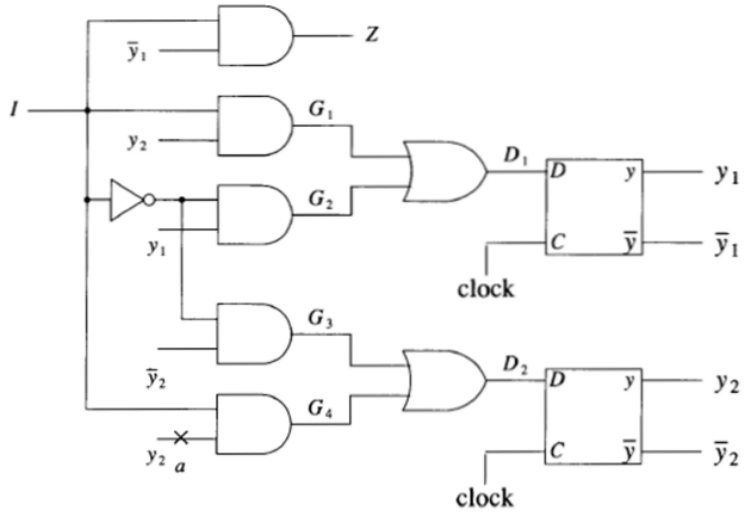
♣ Backtrack ➡ b=0 ➡ Failure (i.e. ➡ e=1) X

Assuming f is set

Decision Tree



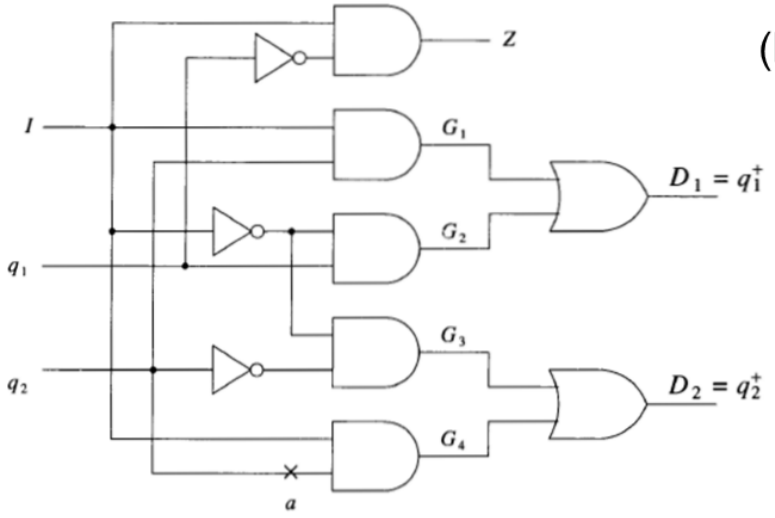
6.32 – Derive a test sequence for Z s-a-0.



(a)

(a) Assume an initial state of (q_1=q_2=1)

	I	q_1	q_2	q_1^+	q_2^+	Z
Timeframe 1	0	1	1	1	0	0
Timeframe 2	1	1	0	0	0	0
Timeframe 3	1	0	0			1



(b)

(b) Assume an unknown initial state (x,x)

If I=0 then next states are (x,x)

If I=1 then next states are (x,x)

Can not initialize!!