

Solutions to Homework 6 Problems

ELEC 7250 VLSI Testing (Spring 2006)

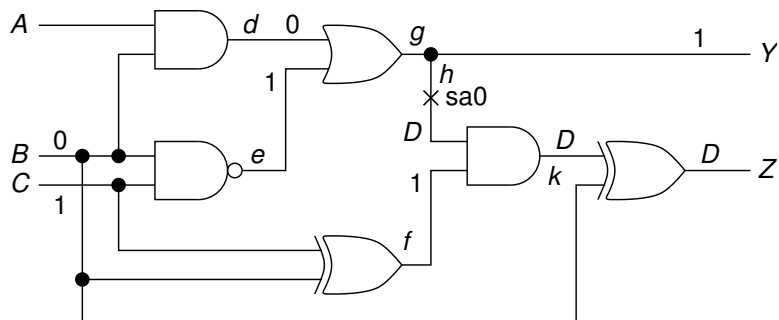
March 3, 2006

Problem 7.4 D-ALG

We level order the signals and proceed as follows:

Step no.	Action	Signals										<i>D</i> front.	Impl. stack		
		<i>A</i>	<i>B</i>	<i>C</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>Y</i>	<i>h</i>	<i>k</i>			<i>Z</i>	
1	Fault activation							1	1	<i>D</i>			<i>k</i>	<i>g</i> = 1	
2	<i>D</i> -drive <i>h</i> → <i>k</i>							1	1	1	<i>D</i>	<i>D</i>	<i>Z</i>	<i>f</i> = 1 <i>g</i> = 1	
3	<i>D</i> -drive <i>k</i> → <i>Z</i>	0						1	1	1	<i>D</i>	<i>D</i>	<i>D</i>	<i>PO</i>	<i>B</i> = 0 <i>f</i> = 1 <i>g</i> = 1
	Immediate Impl.	0	0					1	1	1	<i>D</i>	<i>D</i>	<i>D</i>	<i>PO</i>	"
	Immediate Impl.	0	0	1				1	1	1	<i>D</i>	<i>D</i>	<i>D</i>	<i>PO</i>	"
	Immediate impl.	0	1	0	1			1	1	1	<i>D</i>	<i>D</i>	<i>D</i>	<i>PO</i>	"

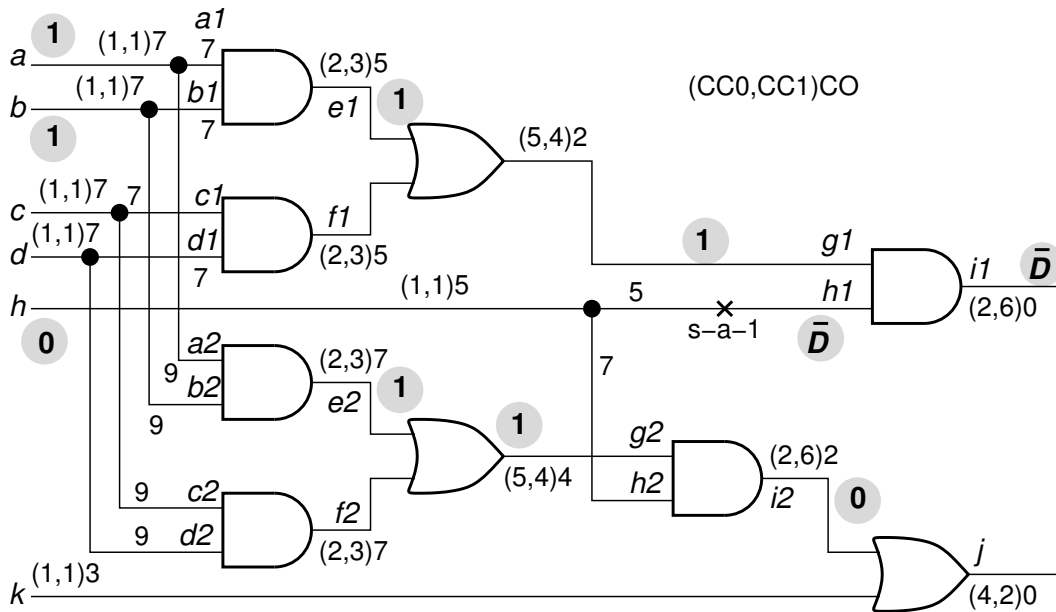
The test is: $A = X$, $B = 0$, $C = 1$ as shown in the following figure; 0 backtracks.



Problem 7.14 PODEM

Step	Objective (goal)	Impl. stack	Forward implications	D frontier	X path
1	Fault act.	$h = 0$	$h = 0, h1 = \bar{D}, i2 = 0$	$i1$	ok
2	Fault prop. $g1 = 1$	$h = 0, a = 1$	$a = 1, h = 0, h1 = \bar{D}$ $i2 = 0$	$i1$	ok
3	Fault prop. $g1 = 1$	$h = 0, a = 1$ $b = 1$	$a = 1, b = 1, e1 = 1$ $e2 = 1, g1 = 1, g2 = 1$ $h = 0, h1 = \bar{D}, i1 = \bar{D}$ $i2 = 0$	PO	ok
<i>Test found: $(a, b, c, d, h, k) = (1, 1, X, X, 0, X)$; $i1 = \bar{D}$</i>					

The following figure shows the SCOAP testability measures used to guide the PODEM algorithm, and the signal values determined.



This test is found without any backtracks.