HW02

Friday, September 19, 2025 2:06 PM

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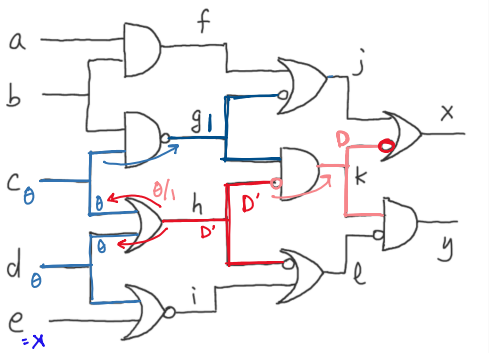
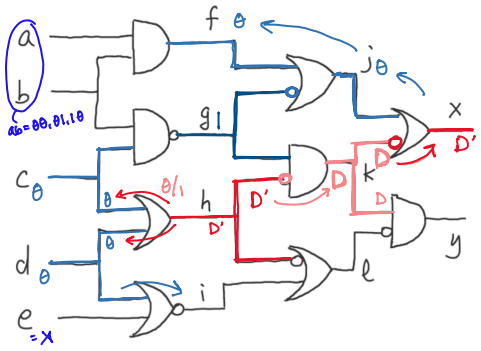


① Activate h-SA1

↳ $h = D'$ ∴ $CD = 00$

↳ $C = 0$ ∴ $g = 1$ ∴ $K = D$

$D = 0$ ∴ $i = e$



② Propogate h SA1

↳ Propogate to x

↳ $g = 1$, invert h @ input ∴ $K = D$

↳ $K = D$, invert K @ input ∴ $X = D'$, $J = 0$

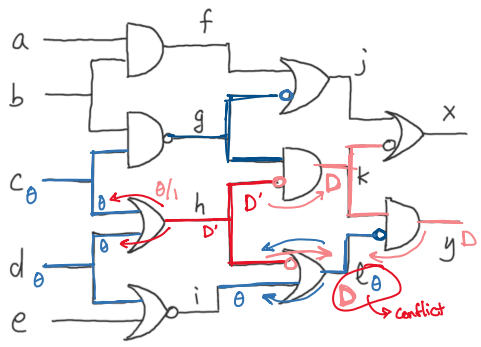
↳ $J = 0$ ∴ $fg = 01$, no conflict at g √

↳ A≠B = θ, AB = 00, 01, 10

↳ E has no impact on x

for $X = D'$

$TV = \begin{pmatrix} 00 \\ 01 \\ 10 \end{pmatrix} 0 0 X$ ⇒ 6 possible TV



↳ Propogate to Y

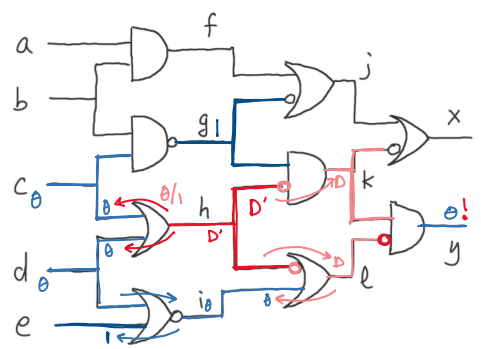
↳ propogate through K

$K = D$ ∴ $y = d$, $l = 0$

$l = 0$ ∴ $hi = 10$

$h = D'$ ∴ h cannot be 1

Conflict! y cannot propogate through K



↳↳ propogate through l

$h = D'$ ∴ $l = D$

↳ if $l = D$ then $y = D \not\equiv D' = 0$

Conflict! $y = 0$

fail to propogate

In order to activate fault h-SA-1, which of the followings must be correct? (Select all that apply.)

- ☐ we have to create a D @ location h
- ☑ we have to create a D' @ location h — $D' = 0/1$ for good/Bad
- ☐ input b must be set to 0
- ☑ input c must be set to 0
- ☐ input d must be set to 1 — $d = 0$!
- ☑ in a good circuit, g = 1
- ☑ in a bad circuit, g = 1

} $C = 0$ ∴ $g = 1$ — Property of NAND

To activate fault h-SA-1 and propagate a difference via output x, one can get:

- ○ neither D nor D' at output x
- ○ D only at output x
- ☑ D' only at output x
- ○ either D or D' are possible at output x

How many test vectors exists to observe a difference at output x?

6 — TV = (A NAND B) 00 X, 3 * 2

To activate fault h-SA-1 and propagate a difference via output y, one can get:

- ☑ neither D nor D' at output y
- ○ D only at output y
- ○ D' only at output y
- ○ either D or D' are possible at output y

How many test vectors exists to observe a difference at output y?

0 — h-SA1 is not Detectable on Y