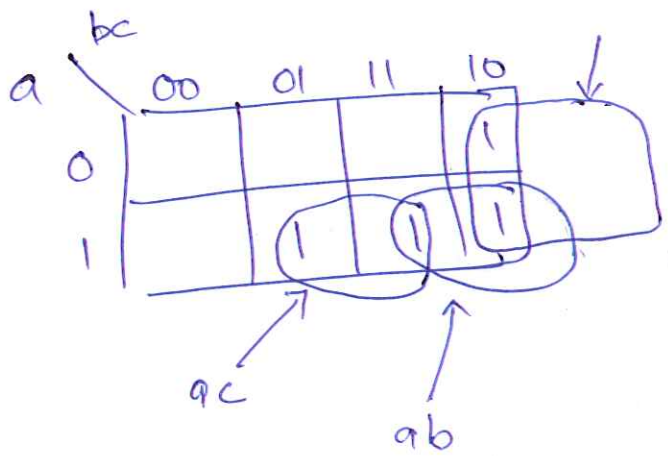
[Testability of prime & irredundant Two-Level circuits.]

$$f = ab + ac + b\bar{c}$$

a	b	c	f
1	1	–	1
1	–	1	1
–	1	0	1

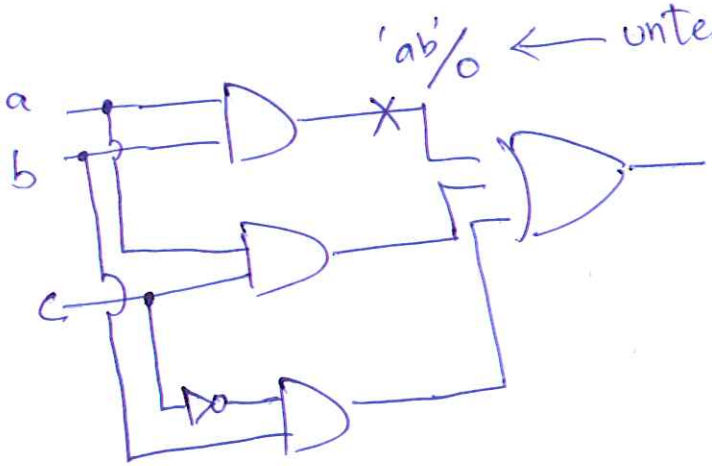


All cubes are prime.

'ab' = redundant ⇒ 'drop' ab from the cover of f

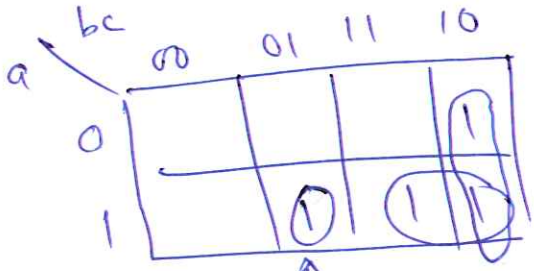
⇒ $f = ac + b\bar{c}$

Redundancy ⟺ untestable fault



Now consider the same function

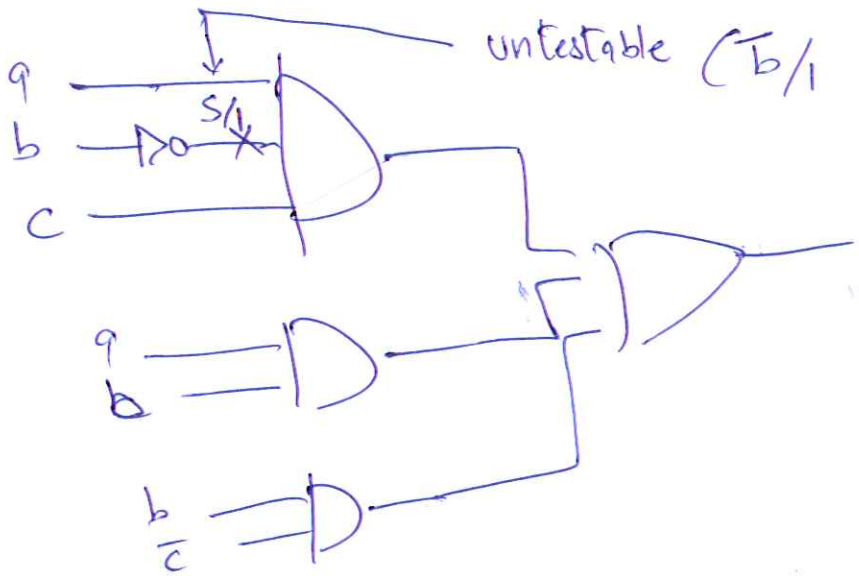
$$f = a\bar{b}c + ab + b\bar{c}$$



non-prime cube → $a\bar{b}c$

But, cover = irredundant

⇒ cannot 'drop' any cube from the cover.



Conclusion:-

Non-prime cubes ⇒ untestable s/1 on And gate inputs.

Non-irredundant cover ⇒ untestable s/0 on OR-gate inputs.

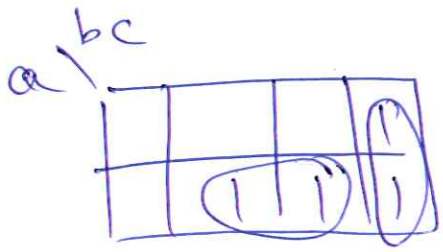
Make a two-level cover

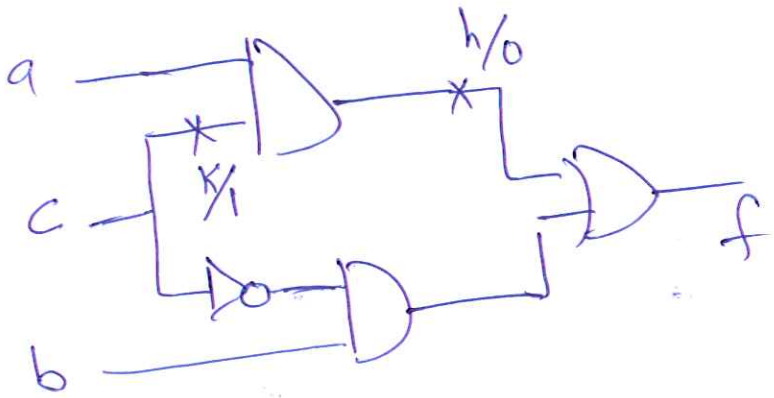
prime & irredundant

$\Leftrightarrow$ every fault testable

$$f = ab + ac + b\bar{c}$$

$$= ac + b\bar{c}$$





$T_{h/0}$ $a=1, c=1$ $f = 1/0$

$T_{k/1}$ $a=1, c=0, b=0, f = 0/1$

Concept of prime + irredundant too complicated for multi-level circuits.