

# Computer Science CSCI 355

## Digital Logic and Computer Organization

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## Example cont.

cd	00	01	11	10
ab	1	0	0	1
01	1	1	1	0
11	0	0	1	0
10	1	0	1	1

$b'd'$  is the only essential PI  
(red grouping)

## Example cont.

cd	00	01	11	10
ab	1	0	0	1
	1	1	1	0
	0	0	1	0
	1	0	1	1

Cover = {b'd'} U { ? }

## Example cont.

cd	00	01	11	10
ab	1	0	0	1
01	1	1	1	0
11	0	0	1	0
10	1	0	1	1

Cover = {b'd'} U {a'bc', acd, ?}

## Example cont.

cd	00	01	11	10
ab	00	01	11	10
	1	0	0	1
	1	1	1	0
	0	0	1	0
	1	0	1	1

Cover = {b'd'} U {a'bc', acd, ?}

? = a'bd or bcd

## Example cont.

f		cd			
		00	01	11	10
ab	00	1	0	0	1
	01	1	1	1	0
	11	0	0	1	0
	10	1	0	1	1

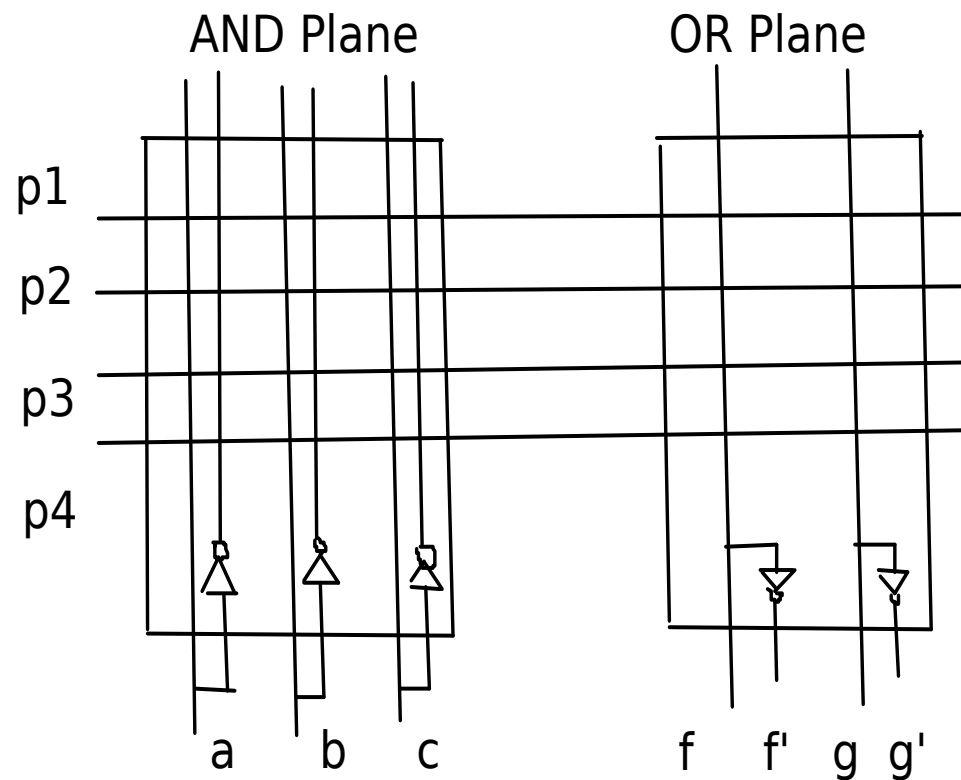
$$f = b'd' + a'bc' + acd + a'bd$$

## Logic Minimization

- SOP K-Maps Minimization Criteria
  - the total number of product terms (✓)
  - the size of product terms (?)
  - the number of inverters (×)
- Technology Mapping
  - TTL ICs (×)
  - Programmable Logic Arrays (✓)

# Programmable Logic Array (PLA)

- Abstract View





# Programmable Logic Array (PLA) cont.

- Abstract View

