

SOP & POS in kmaps

Goal \rightarrow	Starting Form	Ending Form
	Σm	
	ΠM	SOP _{min}
	SOP	POS _{min}
	POS	

Method Build a plan for conversion using following properties

- ① Negating a Kmap for F negates F
 Flip all bits in kmap yield function for F'
- ② Negating SOP expression for F yields POS expression for F'

$$F = ABC' + A'B + C'$$

$$F' = (ABC' + A'B + C')'$$

$$= (ABC')'(A'B)'(C')'$$

$$= (A+B+C')(A+B')(C)$$

swap AND, OR
negate vars
- ③ Negating POS expression for F yields SOP expression for F'
 run previous derivation backwards
- ④ $\Sigma m(\text{list}) = \Pi M(\text{list}')$
 list' are #'s not in list
- ⑤ $F'' = F$

Plan 1 Σ_m to SOP_{min}

Step	1	2	3
Function	F	F	F
Form	Σ_m	Kmap	SOP _{min}

Plan 2 Σ_m to POS_{min}

Step	1	2	3	4	5
Function	F	F	F'	F'	F'' = F
Form	Σ_m	Kmap	Kmap	SOP _{min}	POS _{min}

Step 1 $F = \Sigma_m(3, 4, 5)$

Step 2

	bc	00	01	11	10
a	0			1	
	1	1	1		

F

Step 3

	bc	00	01	11	10
a	0	1	1		1
	1			1	1

F'

Step 4 $F' = a'b' + ab + bc'$

Step 5 $F'' = F = (a+b)(a'+b')(b'+c)$

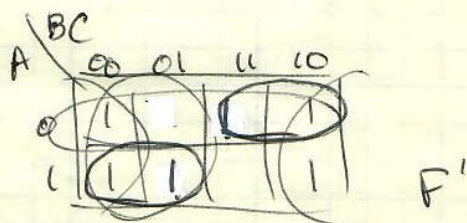
Plan 3 POS to POS_{min}

Step	1	2	3	4	5
Function	POS	SOP	Kmap	SOP _{min}	POS _{min}
Form	F	F'	F'	F'	F'' = F

Step 1 $F = (A' + B + C')(A + B')(C)$

Step 2 $F' = A'B'C + A'B + C'$

Step 3



Step 4 $F' = C' + AB' + A'B$

Step 5 $F'' = F = C(A' + B)(A + B')$