

6.7

Bestäm mintermer till: $f(w_1, w_2, w_3) = \bar{w}_2 + \bar{w}_1 \bar{w}_3 + w_1 w_3$

Shannons expansionsteorem: Bryt ut w_1 : Sätt $w_1=0$ + $w_1=1$; två summer.
Gör om för $w_{i+1} \rightarrow n$

$$f(w_1, w_2, w_3) = \bar{w}_1 \bar{w}_2 \bar{w}_3 + w_1 \bar{w}_2 \bar{w}_3 + \bar{w}_1 w_2 \bar{w}_3 + \bar{w}_1 \bar{w}_2 w_3 + w_1 \bar{w}_2 w_3 + w_1 w_2 w_3$$

Komplettering: Se till att alla variabler finns med, lägg till de som saknas

$$f = (w_1 + \bar{w}_1) \cdot w_2 \cdot (w_3 + \bar{w}_3) + \bar{w}_1 (w_2 + \bar{w}_2) \bar{w}_3 + w_1 (w_2 + \bar{w}_2) w_3$$

Karnaugh: w_3

1	1	0	1
1	0	1	1

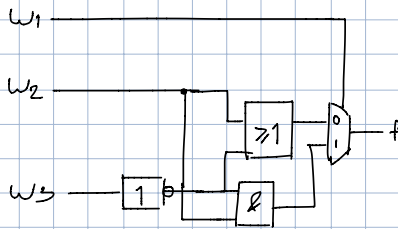
 $\bar{w}_1 \bar{w}_2 \bar{w}_3 + \bar{w}_1 w_2 \bar{w}_3 + \bar{w}_1 \bar{w}_2 w_3 + \bar{w}_1 w_2 w_3 + w_1 \bar{w}_2 \bar{w}_3 + w_1 \bar{w}_2 w_3 + w_1 w_2 \bar{w}_3 + w_1 w_2 w_3$

6.5

$$f(w_1, w_2, w_3) = \sum m(0, 2, 3, 6) = \bar{w}_1 \bar{w}_2 \bar{w}_3 + \bar{w}_1 w_2 \bar{w}_3 + \bar{w}_1 w_2 w_3 + w_1 w_2 \bar{w}_3$$

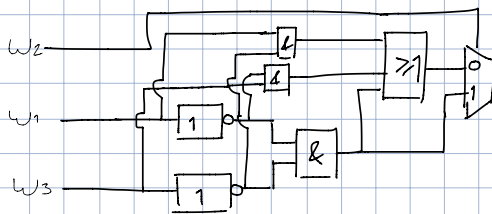
implementera med 2-1 mux.

$$\text{Räkning} \rightarrow = \bar{w}_1 (w_2 + \bar{w}_3) + w_1 w_2 \bar{w}_3$$



w_2 som switch

$$\begin{aligned} f &= \bar{w}_1 \bar{w}_2 \bar{w}_3 + \bar{w}_1 w_2 \bar{w}_3 + \bar{w}_1 w_2 w_3 + w_1 w_2 \bar{w}_3 = \\ &= w_2 (\bar{w}_1 \bar{w}_3 + \bar{w}_1 w_3 + w_1 \bar{w}_3) + \bar{w}_2 (\bar{w}_1 \bar{w}_3 + \bar{w}_1 w_3 + w_1 \bar{w}_3) = \\ &= w_2 (\bar{w}_1 \bar{w}_3 + \bar{w}_1 w_3 + w_1 \bar{w}_3) + \bar{w}_2 (\bar{w}_1 \bar{w}_3 + \bar{w}_1 w_3 + w_1 \bar{w}_3) = \end{aligned}$$



4.25

Minimera: $f(x_1, x_2, x_3, x_4) = \sum m(0, 3, 4, 5, 7, 9, 11) + D(8, 12, 13, 14)$

0	0000	✓	0,4: 0 - 00	✓
4	0100	✓	0,8: - 000	✓
8	1000	✓	4,5: 010 -	✓
3	0011	✓	4,12: - 100	✓
5	0101	✓	8,9: 100 -	✓
9	1001	✓	8,12: 1 - 00	✓
12	1100	✓	3,7: 0 - 11	←
7	0111	✓	3,11: - 011	←
11	1011	✓	5,7: 01 - 1	←
13	1101	✓	5,13: - 101	✓
14	1110	✓	9,11: 10 - 1	←
			9,13: 1 - 01	✓
			12,13: 110 -	✓
			12,14: 11 - 0	←

0,4,8,12:	- - 00	←
4,5,12,13:	- 1 0 -	←
8,9,12,13:	1 - 0 -	←

	0	3	4	5	7	9	11
P ₁	x				x		
P ₂	x						x
P ₃				x	x		
P ₄						x	x
P ₅							
P ₆	x		x				
P ₇			x	x			
P ₈						x	

	3	5	7	9	11
P ₁	x		x		
P ₂	x				x
P ₃	x	x			
P ₄			x	x	
P ₇	x				
P ₈			x		

OSV

Med karnaugh kan man se vilken som är billigast om antalet variabler ≤ 4

4.24

McQ-minimera: $f(x_1, x_2, x_3, x_4) = \sum m(0, 4, 6, 8, 9, 15) + D(3, 7, 11, 13)$

0	0000	✓	0,4: 0 - 00	×
4	0100	✓	0,8: - 000	×
8	1000	✓	4,6: 01 - 0	×
3	0011	✓	8,9: 100 -	×
6	0110	✓	3,7: 0 - 11	
9	1001	✓	3,11: - 011	
7	0111	✓	6,7: 011 -	
11	1011	✓	9,11: 10 - 1	
13	1101	✓	9,13: 1 - 01	
15	1111	✓	7,15: - 111	
			11,15: 1 - 11	
			13,15: 11 - 1	