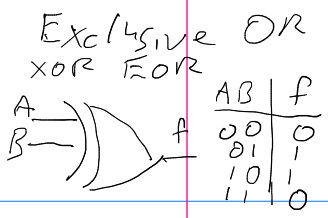


Optimization

Chapter 2 in the text

(Was Chapter 4 in the older texts)

K-maps (Karnaugh)

Truth Tables

Venn Diagram

Different ways to represent a function

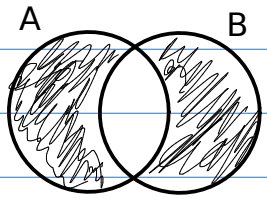
There are different arrangements for showing all possibilities in combinations of inputs

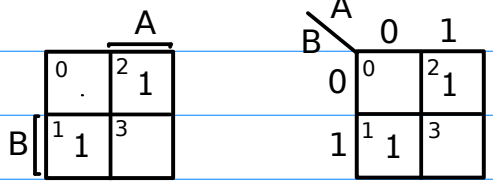
Each region (or row) corresponds to a minterm or maxterm of the function

Two ways to do the labeling

2 variables:

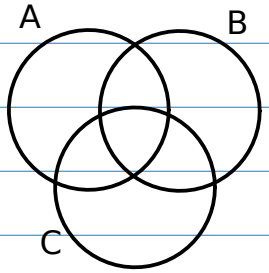
A	B	f
0	0	0
0	1	1
1	0	1
1	1	0

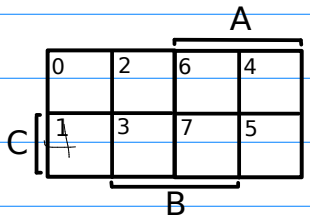


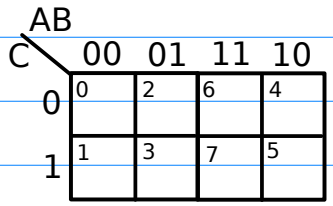


3 variables:

A	B	C	f
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

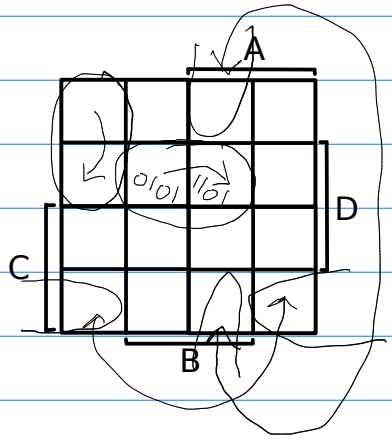


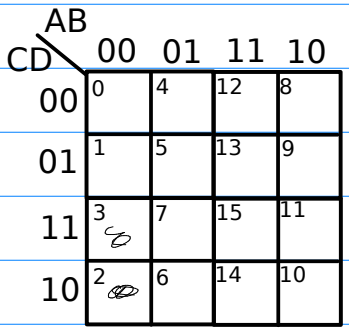




4 variables:

Remember: the order of the variables is significant: f(A,B,C,D) would lay out differently from f(D,C,B,A)





5 variables:

f(A,B,C,D,E)

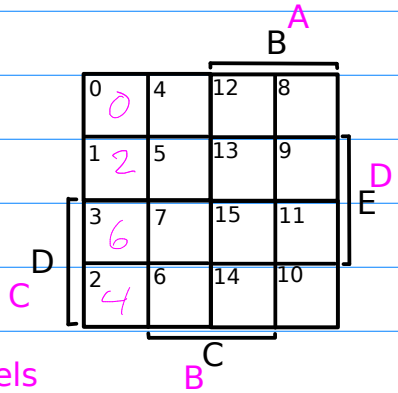
0 0 0 0 0

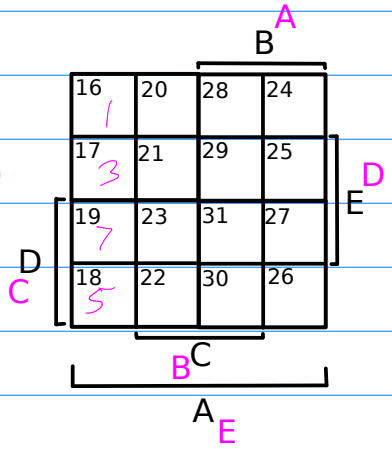
0 0 0 0 1

0 0 0 1 0

0 0 0 1 1

etc.





The book labels this differently

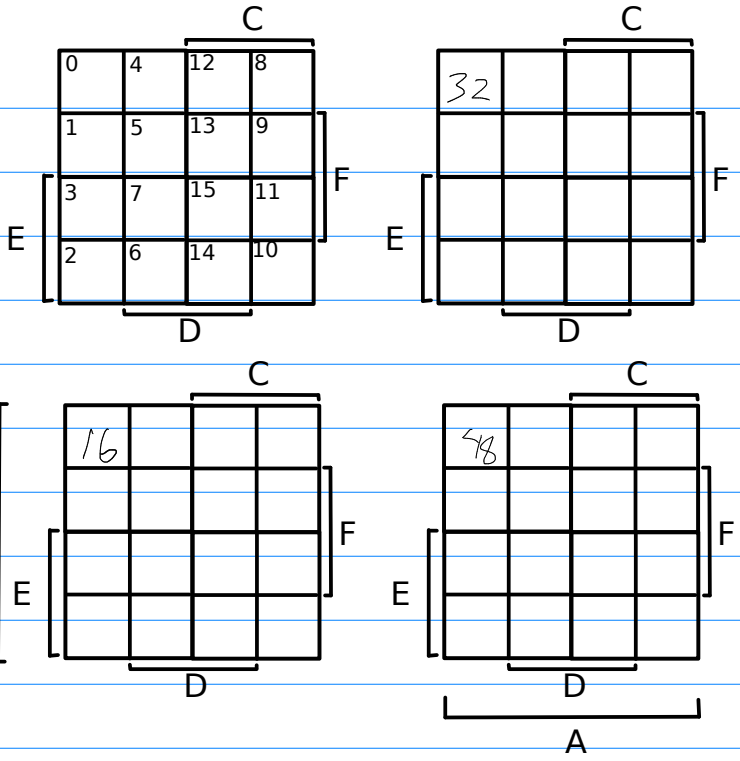
6 variables:

AB C D E F

16 = 010000

32 = 100000

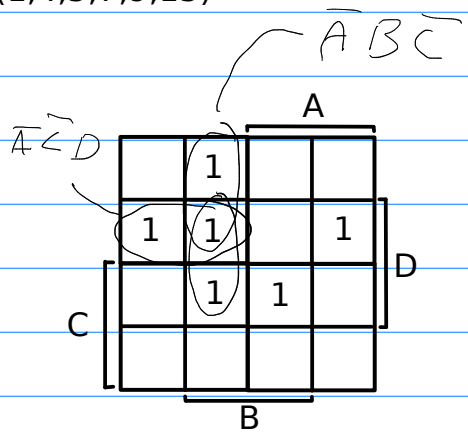
48 = 110000



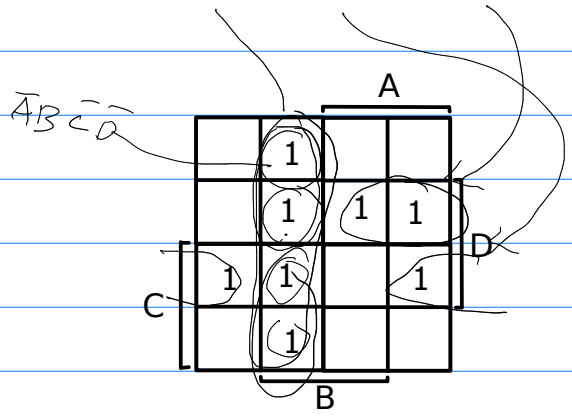
Representing a function in the K-map

$f(A,B,C,D) = \sum m(1,4,5,7,9,15)$

A	B	C	D	f
0	0	0	0	0
0	0	0	1	1
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	1
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1



$f(A,B,C,D) = \bar{A}B + \bar{B}CD + A\bar{C}\bar{D}$



We usually only put in the 1's
(And leave out the 0's)