

Karnaugh Map Simplification Process

NCEES® FE Reference Handbook Pages 224 - 225



STUDY FOR FE

1. Construct K-Map based on truth table
2. Group large sets of adjacent cells containing 1's and form least # of groups.

Groups can be formed in sets of 1, 2, 4, 8 etc.

3. Adjacent cells are the cells that differ in only one variable
4. Cells in Top and Bottom rows of the K Map are adjacent

		CD			
		00	01	11	10
AB	00	1	1	1	1
	01				
	11				
	10	1	1	1	1

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

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4. Cells in Top and Bottom rows of the K Map are adjacent
5. Cells in Left and Right columns are adjacent

		CD			
		00	01	11	10
AB	00	1			1
	01	1			1
	11	1			1
	10	1			1
		C'D'			CD'

$$CD' + C'D' = (C+C')D' = D'$$

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4. Cells in Top and Bottom rows of the K Map are adjacent
5. Cells in Left and Right columns are adjacent
6. Cells in the four corners of K Map are adjacent (non-diagonal)

		CD			
		00	01	11	10
AB	00	1			1
	01				
	11				
	10	1			1

The table is a 4x4 Karnaugh map. The columns are labeled 'CD' with values 00, 01, 11, 10. The rows are labeled 'AB' with values 00, 01, 11, 10. The cells at (00,00), (00,10), (10,00), and (10,10) contain the number '1' and are highlighted in yellow. Double-headed arrows connect the '1's in the top row (00,00) and (00,10), the bottom row (10,00) and (10,10), the left column (00,00) and (10,00), and the right column (00,10) and (10,10).

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4. Cells in Top and Bottom rows of the K Map are adjacent
5. Cells in Left and Right columns are adjacent
6. Cells in the four corners of K Map are adjacent
7. Write the OR sum of all groups

		CD			
		00	01	11	10
AB	00				
	01		1	1	
	11		1	1	
	10				

BD