

# The Structure of a K-Map

A K-Map is a table made of cells or boxes. Each cell represents one possible combination of inputs from a truth table.

The total number of cells is  $2^n$ , where  $n$  is the number of variables.

Variabel		Y	
		0	1
X	0		
	1		

- For 2 variables (X, Y), we need  $2^2 = 4$  cells.

- For 3 variables (X, Y, Z), we need  $2^3 = 8$  cells.

Variabel		YZ			
		00	01	10	11
X	0				
	1				

- For 4 variables (W, X, Y, Z), we need  $2^4 = 16$  cells.

Variabel		YZ			
		00	01	10	11
WX	00				
	01				
	10				
	11				

A special rule for K-Maps is the way the rows and columns are labeled. The binary numbers are ordered so that only one bit changes between any two adjacent cells. This is why the labels are `00, 01, 11, 10` instead of the usual `00, 01, 10, 11`. This special ordering is the key that makes simplification possible.

This ordering also means the map "wraps around." The far-right column is considered adjacent to the far-left column, and the top row is adjacent to the bottom row.

---

Revision #1

Created 2025-09-19 13:09:23 UTC by DY

Updated 2025-09-19 13:16:58 UTC by DY