

SOP & POS Forms

Electrical Engineering

Turning a truth table into a canonical expression, by minterms or by maxterms.

Both forms describe the same function; only the cost differs.

1 Write the truth table

One row per input combination, listed in binary counting order.

2 For sum of products

Take every row that outputs 1 and write its minterm as a product.

3 Build the sum

OR those minterms. Complement any input that is 0 in that row.

4 For product of sums

Take every row that outputs 0 and write its maxterm as a sum.

5 Build the product

AND those maxterms. Complement any input that is 1 in that row.

SOP is cheaper when few rows output 1, POS when few output 0. Count the rows before choosing which form to expand.