Canonical Forms

Canonical forms are standardized ways to express Boolean functions, making it easier to build and simplify circuits. The 2 main types are Sum of Products (SOP) and Product of Sums (POS), which describe when a circuit should output a 1 or a 0.

SOP expressions are built from **minterms**, which represent truth table rows where the output is 1, while POS expressions are built from **maxterms**, which represent rows where the output is 0.

Sum of Products:
- SOP uses minterms
- Look at rows where f=1 in the truth table
- Each 1 becomes an ANDed term (A'B'C)
- OR all AND terms together

For example, if F=1 at (A=0, B=1, C=0), the minterm is A'BC'

Product of Sums:
- POS uses maxterms
- Look at rows where F=0 in the truth table
- Each 0 becomes an ORed term (A+B'+C)
- AND all the OR terms together

for example, if F=0 at (A=1, B=0, C=1), the maxterm is A'+B+C'