Definition

An expression in Boolean algebra is in <u>disjunctive normal form</u>, commonly written as DNF, if it is the sum of products, each of which contains each variable of the expression precisely once, although in either the form a or $\bar{a}$.

Examples

- The expression $ab + b\bar{c}$ is not in DNF. However, we can remedy that as follows.

$$ab + b\bar{c} = ab(c + \bar{c}) + (a + \bar{a})b\bar{c} \quad \text{using axiom (viii)}$$
$$= abc + ab\bar{c} + ab\bar{c} + \bar{a}b\bar{c} \quad \text{axiom (ix)}$$

which is in DNF. Notice that this approach is redolent of the algorithm in the first h/w for solving a set equation.

Notice that if, for example, our model of Boolean algebra were to be logic, then applying truth values to each of the summands would yield the overall truth value very simply. (There is also the dual conjunctive normal form if you prefer that approach.)