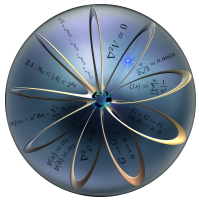

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truth table

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A *truth table* is a tabular listing of all possible input value combinations for a logical function and their corresponding output values. Similarly, the truth table of a logical proposition is the truth table of the corresponding logical function.

For instance, the truth table of the connective "or" is as follows:

a	b	$a \vee b$
F	F	F
F	T	T
T	F	T
T	T	T

For n input variables, there will always be 2^n rows in the truth table. A sample truth table for "$(a \wedge b) \rightarrow c$" would be

a	b	c	$(a \wedge b) \rightarrow c$
F	F	F	T
F	F	T	F
F	T	F	T
F	T	T	F
T	F	F	T
T	F	T	F
T	T	F	T
T	T	T	T

(Note that $\wedge$ represents logical and, while $\rightarrow$ represents the conditional truth function).

To compute truth tables of expressions, one often proceeds in steps. for instance, to compute a truth table for "$\neg p \vee (p \wedge q)$, one might proceed as follows:

p	q	$\neg p$	$(p \wedge q)$	$\neg p \vee (p \wedge q)$
F	F	T	F	T
F	T	T	F	T
T	F	F	F	F
T	T	F	T	T

For reference, here is a truth table of some popular connectives:

p	q	$p \vee q$	$p \wedge q$	$p \veebar q$	$p \to q$	$p \leftrightarrow q$
F	F	F	F	F	T	T
F	T	T	F	T	T	F
T	F	T	F	T	F	F
T	T	T	T	F	T	T

For completeness, here are the remaining connectives, excluding trivial connectives which depend on only one or none of their arguments:

p	q	$p \barwedge q$	$p \bar{\vee} q$	$p \leftarrow q$	$p \not\to q$	$p \not\leftarrow q$
F	F	T	T	T	F	F
F	T	T	F	F	F	T
T	F	T	F	T	T	F
T	T	F	F	T	F	F