Discrete Mathematics

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1 Propositional Logic

In propositional logic, propositions are denoted by letters (p, q) and are formed by connecting other propositions using logical connectives. Propositions can either be true (T) or false (F).

1.1 Logical Connectives

The logical connectives listed below are the basic connectives available in propositional logic in order of their precedence. Below are the truthtables corresponding to each of the connectives.

1. $\neg$, not
2. $\wedge$, and
3. $\vee$, or
4. $\rightarrow$, $\Rightarrow$, implies (only if)
5. $\leftrightarrow$, $\Leftrightarrow$, is equivalent to (if and only if, iff)

Negation

p	¬ p
T	F T
F	T F

Logical And

p q	p ∧ q
T T	T T T
T F	T F F
F T	F F T
F F	F F F

Logical Or

p q	p ∨ q
T T	T T T
T F	T T F
F T	F T T
F F	F F F

Implication

p q	p → q
T T	T T T
T F	T F F
F T	F T T
F F	F T F

Equivalence

p q	p ↔ q
T T	T T T
T F	T F F
F T	F F T
F F	F T F