Describe BNF Grammar Propositional Logic

Propositional Logic

Propositional logic is a subset of the predicate logic.

! Syntax

! Semantics

! Models

! Inference Rules

! Complexity

Syntax of Propositional Logic

! symbols

! logical constants True, False

! propositional symbols P, Q, …

! logical connectives ! conjunction ∧, disjunction ∨, ! negation ¬,

! implication ⇒, equivalence ⇔ ! parentheses (, )

! sentences ! constructed from simple sentences ! conjunction, disjunction, implication, equivalence, negation

BNF Grammar Propositional

Logic Sentence → AtomicSentence | ComplexSentence

AtomicSentence → True | False | P | Q | R | ...

ComplexSentence → (Sentence ) | Sentence

Connective Sentence | ¬ Sentence Connective → ∧ | ∨ | ⇒ | ⇔

ambiguities are resolved through precedence ¬∧∨⇒⇔ or parentheses e.g. ¬ P ∨ Q ∧ R ⇒ S is equivalent to (¬ P) ∨ (Q ∧ R)) ⇒ S

Semantics of Propositional Logic

! interpretation of the propositional symbols and constants

! symbols can be any arbitrary fact

! sentences consisting of only a propositional symbols are satisfiable, but not valid

! the constants True and False have a fixed interpretation

! True indicates that the world is as stated

! False indicates that the world is not as stated