Vocabulary and Grammar of SL

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Vocabulary of SL (Sentential Logic)

- Sentences (sentence letters)
  - Can have subscripts if more are needed
- Truth-Functional Connectives → Truth value of resulting sentence is entirely dependent on input values and Truth Table of connective
  - Conjunction
  - Disjunction
  - Conditional
  - Negation
  - Biconditional
- Punctuation (,)

Grammar of SL

* P is just a placeholder for any sentence, atomic or molecular

- Every sentence letter is a sentence
- If P is a sentence, so is ~P.
- If P and Q are sentences, then P & Q, P ∨ Q, P → Q, and P ≡ Q are all sentences.
- Nothing is a sentence unless it can be reduced to atomic sentences according to these rules.

Main Connective

- Determines what kind of sentence a sentence is.
- Determines, in the end, the Truth Value of a sentence.

definition

- If P is atomic, it has no main connective.
- If P is the negation of another sentence, P's main connective is ~.
- If P is Q & R, Q ∨ R, Q → R, Q ≡ R, then that connective is the main connective.

Ex.

D ~((D ≡ F) ∨ M)

F not D if and only if F or M

M

Main connective is negation
- Truth-value is dependent on the input and output of the ~.

((D ≡ F) ∨ M) → Main connective is disjunction.

(D ≡ F) → Main connective is biconditional

Example with TV assignment

D → F
F → T
M → T

Truth Value assignment out of 8 possible

~((D ≡ F) ∨ M)

D ≡ F → F

F ∨ M → T

~(T) → F

Given these truth-values, this sentence as a whole is false.