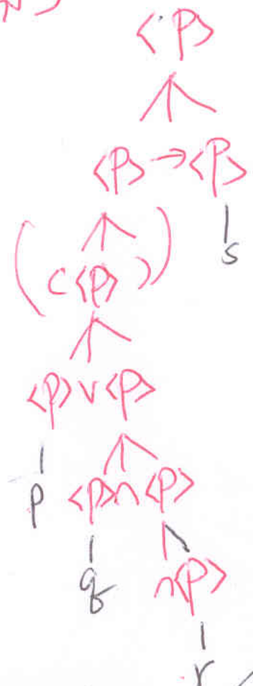
2/28 제 2강 propositional & predicate

precedence & associativity of operators
(infix binary operator)

syntax grammar (文法) N. Chomsky

$$\langle p\rangle = \underbrace{T \mid F \mid \overset{p|q|r|s|\cdots}{v}}_{\text{basis}} \mid \underbrace{\neg\langle p\rangle \mid \langle p\rangle \vee \langle p\rangle \mid \langle p\rangle \wedge \langle p\rangle \mid \langle p\rangle \to \langle p\rangle \mid \langle p\rangle \leftrightarrow \langle p\rangle \mid (\langle p\rangle)}_{\text{recursion}}$$

~~recursion~~ basis



parse tree

$p \vee q \wedge \neg r \to s$

ex) $\langle \cancel{P}S\rangle \to \langle S\rangle\ \langle V\rangle$

$\mid \langle S\rangle\ \langle V\rangle\ \langle C\rangle$

$\mid \langle S\rangle \langle V\rangle\ \langle O\rangle$

$\mid \langle S\rangle \langle V\rangle\ \langle O\rangle \langle O\rangle$

$\mid \langle S\rangle\ \langle V\rangle\ \langle O\rangle\ \langle C\rangle$

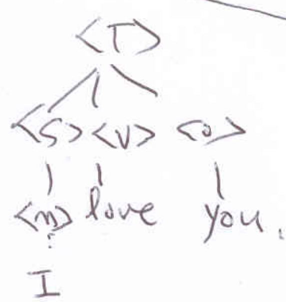
=

$\langle T\rangle, \langle S\rangle\ \langle V\rangle \langle O\rangle \langle C\rangle$ syntactic category

$\{\langle p\rangle\}$ - nonterminals

$\{T, F, v\}$ - terminals

$v \leftarrow p, q, r, s, \ldots$



Definition 5 implication

$p \to q$

$A = \{x \in U \mid p(x)\}$ if $A \subseteq B$
$B = \{x \in U \mid q(x)\}$ then $p \to q$ is true.

Def 6 biconditional

$$p \leftrightarrow q \equiv p \to q \wedge q \to p \equiv \neg(p \oplus q)$$

p	q	$p \leftrightarrow q$
T	T	T
F	F	F
F	T	F
F	F	T

p	q	T	$p \vee q$				
T	T	T	T	T	T	T	F
T	F	T	T	T	T	F	F
F	T	T	T	F	F	T ...	F
F	F	T	F	T	F	T	F

$2^4 = 16$

1.2 Propositional Equivalence

- Tautology
- Contradiction
- Contingency

$p \leftrightarrow q$ is tau. p, iff q is true.

$p \equiv q$ or $p \Leftrightarrow q$

If $p \to q$ is a tautology, we write $p \Rightarrow q$.

3)

p	F	$p \vee F$
T	F	T
F	F	F

$\therefore p \equiv p \vee F$

$\Leftrightarrow$

$=$

set complement

$(\vee, \wedge, \neg)$ vs $(\cup, \cap, \overline{})$

$\underline{T}, F$ $\qquad$ $U, \emptyset$