<u>Date</u>:- 04-08-22
<u>Scribed Lecture 3 Notes</u>

<u>Student Id</u>:-
202212011
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<u>Structural Induction:-</u>

Building bigger formulae from smaller formulae using logical connectives

<u>Logical Connectives</u>

1: NOT : ¬
2: OR / DISJUNCTION : ∨
3: AND / CONJUNCTION : ∧
4: EXCLUSIVE OR (XOR) : ⊕ , ⊻
5: IMPLICATION : →
6: EQUIVALENCE / BI-IMPLICATIONS : ⇔
7: NAND -> NOT + AND
8: NOR -> NOT + OR

<u>Note : all operations are generally binary except negation</u>
<u>Note : Implications are not commutative</u>

<u>Atomic Propositions</u>

An atomic proposition is a statement or assertion that must be true or false.

Example : P = {(P0),(P1),(P2) … }

Complicated Formulae

(i) If Ψ is a formula then so is: ¬ (Ψ)
(ii) If Ψ1 is a formula and Ψ2 is a formula then so are :

a. Ψ1 V Ψ2
b. Ψ1 ∧ Ψ2
c. Ψ1 => Ψ2
d. Ψ1< = > Ψ2
e. Ψ1 XOR Ψ2

* formula trees

$(p_0 \Rightarrow ((\neg(p_1)) \wedge (p_2 \vee p_1)))$