Phil 120, Review Notes

Stuff

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1 References

1.1 BasicLogic Operators

The followings are for A * B, where '*' is an operator, A is top row, B is left column.

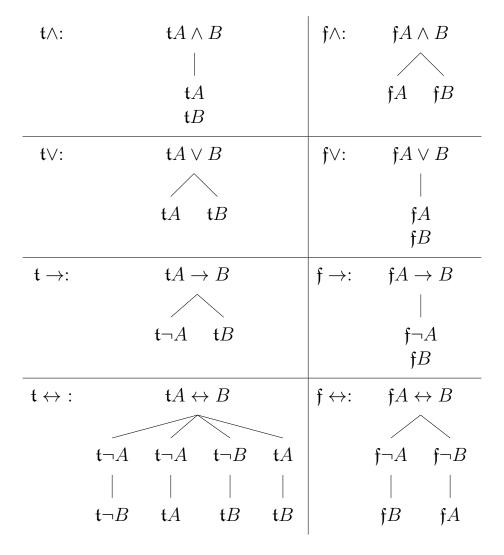
\wedge	$T \mid$	F	
\overline{T}	Т	F	AND. Conjuction. $A \wedge B$ is true only when both A and B are true.
F	F	F	

1.2 Some Logic Identities

$A \vee \neg A = T$	Excluded Middle, either A or not A must be true.
$\neg(A \land \neg A)$	Non-contradiction. It is true that not both A and not A hold at the same time.
$A \to B, A \implies B$	Modus ponenes, to prove. If A implies and B and A is true, then B is true.
$A \to B, \neg B \implies \neg A$	Modus tollens, to disprove. If the conclusion is false, then the premise is false also.
$A \vee B, \neg A \implies B$	Disjunctive syllogism. If at least one of A or B is true, then if one of them is false, the other must be true.
$(A \to B) \iff (\neg B \to \neg A)$	Contrapositive. Similar to Modus tollens.
$A, \neg A \implies B$	Explosion. From a false premise you can arrive at any conclusion.
$ \neg(A \lor B) \iff \neg A \land \neg B \neg(A \land B) \iff \neg A \lor \neg B $	De Morgan's Law.

$$\begin{array}{c} A \vee (B \wedge C) \iff (A \vee B) \wedge (A \vee C) \\ A \wedge (B \vee C) \iff (A \wedge B) \vee (A \wedge C) \end{array} \text{ Distributability}$$

1.3 Tableaux Identities



Note:

- Use De Morgan's Law to deal with negations (\neg) , also, $\neg(A \to B) = (\neg B \land A)$.
- To prove a consequence, set the premise to true, conclusion to false. This proves that there is no possible counter example, since the negation is never satisfied.
 - If there are atomic branches left open, then those are valid counter examples.
- A branch is closed any of following pairs occurs in a branch: $\{(fA, tA), (fA, f\neg A), (tA, t\neg A)\}$