Logik für Informatiker
Logic for computer scientists

Strategies in Fitch

Till Mossakowski, Lutz Schröder

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Conjunction Elimination ($\wedge$ Elim)

$$\begin{array}{l|l} & \mathsf{P}_1 \wedge \ldots \wedge \mathsf{P}_i \wedge \ldots \wedge \mathsf{P}_n \\ & \vdots \\ \triangleright & \mathsf{P}_i \end{array}$$

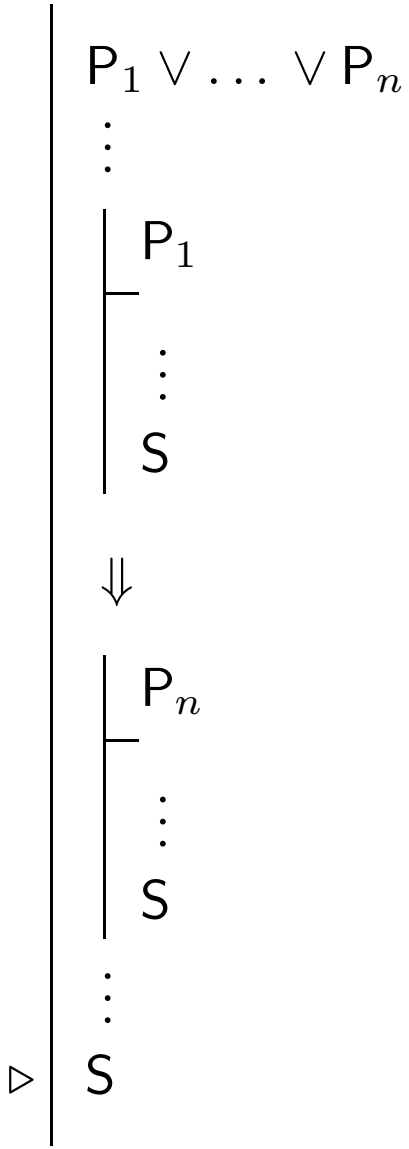
Conjunction Introduction ($\wedge$ Intro)

$$\begin{array}{l|l} & \mathsf{P}_1 \\ & \Downarrow \\ & \mathsf{P}_n \\ & \vdots \\ \triangleright & \mathsf{P}_1 \wedge \ldots \wedge \mathsf{P}_n \end{array}$$

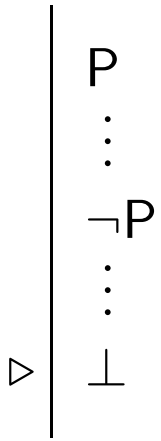
Disjunction Introduction ($\vee$ Intro)

$$\begin{array}{l|l} & \mathsf{P}_i \\ & \vdots \\ \triangleright & \mathsf{P}_1 \vee \ldots \vee \mathsf{P}_i \vee \ldots \vee \mathsf{P}_n \end{array}$$

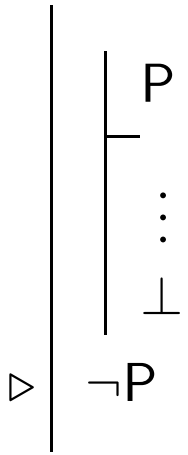
Disjunction Elimination ($\vee$ Elim)



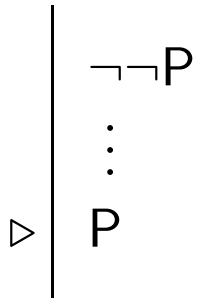
$\bot$ Introduction ($\bot$ Intro)



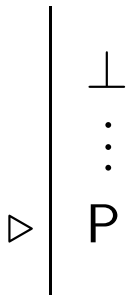
Negation Introduction ($\neg$ Intro)



Negation Elimination ($\neg$ Elim)



$\bot$ Elimination
($\bot$ Elim)



Strategies and tactics in Fitch

1. *Understand* what the sentences are saying.
2. *Decide* whether you think the conclusion follows from the premises.
3. If you think it does not follow, or are not sure, try to find a *counterexample*.
4. If you think it does follow, try to give an *informal proof*.
5. If a *formal proof* is called for, use the *informal proof to guide* you in finding one.
6. In giving consequence proofs, both formal and informal, don't forget the tactic of *working backwards*.
7. In working backwards, though, always check that your *intermediate goals are consequences* of the available information.

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Strategies in Fitch, cont'd

- Always try to *match* the situation in your proof with the *rules* in the book (see book appendix for a complete list)
- Look at the *main connective* in a *premise*, apply the corresponding *elimination rule* (forwards)
- Or: look at the *main connective* in the *conclusion*, apply the corresponding *introduction rule* (backwards)