

# Proof Examples: Using `bussproofs.sty`

15317 Constructive Logic

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`bussproofs.sty` provides a stack machine for programming proof type-setting (i.e. the state is a stack of proof trees).

- `\AxiomC{axiom}` adds a leaf to the stack.
- `\UnaryInfC{conclusion}`, `\BinaryInfC{conclusion}`, `\TrinaryInfC{conclusion}` combine the top 1,2,3 proof trees to obtain conclusion.
- `\LeftLabel{lab}`, `\RightLabel{lab}` adds a label to the next proof step on the left or right, respectively.

Two examples in natural deduction:

$$\frac{\overline{A \text{ true}}^u}{A \supset A \text{ true}} \supset I^u$$

$$\frac{\frac{\overline{A \wedge B \text{ true}}^u}{B \text{ true}} \wedge E_R \quad \frac{\overline{A \wedge B \text{ true}}^u}{A \text{ true}} \wedge E_L}{\frac{B \wedge A \text{ true}}{A \wedge B \supset B \wedge A \text{ true}} \supset I^u} \wedge I$$