# Logiweb sequent calculus, Chores

Klaus Grue

GRD-2006-05-26.UTC:13:59:58.555187

## Contents

1 Test cases 1

2 Pyk definitions 3

3 TEX definitions 7
3.1 Variables . . . . . 15

4 Priority table 18

## 1 Test cases

$[\lceil\overline{x}\rceil\#^0\lceil\overline{y}=\overline{z}\Rightarrow\forall_{\mathrm{obj}}\overline{x}\colon\overline{x}=\overline{y}\rceil\ \text{'ijcar}]^{\cdot}$

$[\lceil\overline{x}\rceil\#^0\lceil\overline{x}=\overline{z}\Rightarrow\forall_{\mathrm{obj}}\overline{x}\colon\overline{x}=\overline{y}\rceil\ \text{'ijcar}]^{-}$

$[\lceil\overline{x}\rceil\#^0\lceil\overline{y}=\overline{x}\Rightarrow\forall_{\mathrm{obj}}\overline{x}\colon\overline{x}=\overline{y}\rceil\ \text{'ijcar}]^{-}$

$[\lceil\overline{x}\rceil\#^0\lceil\overline{y}=\overline{z}\Rightarrow\forall_{\mathrm{obj}}\overline{y}\colon\overline{x}=\overline{y}\rceil\ \text{'ijcar}]^{-}$

$[\langle\lceil\overline{a}\rceil\equiv^0\lceil\overline{a}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{\cdot}$

$[\langle\lceil\overline{b}\rceil\equiv^0\lceil\overline{a}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{-}$

$[\langle\lceil\overline{c}\rceil\equiv^0\lceil\overline{a}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{-}$

$[\langle\lceil\overline{a}\rceil\equiv^0\lceil\overline{b}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{-}$

$[\langle\lceil\overline{b}\rceil\equiv^0\lceil\overline{b}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{-}$

$[\langle\lceil\overline{c}\rceil\equiv^0\lceil\overline{b}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{\cdot}$

$[\langle\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=\overline{b}\rceil\equiv^0\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=\overline{b}\rceil||\lceil\overline{a}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{\cdot}$

$[\langle\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=\overline{c}\rceil\equiv^0\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=\overline{b}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\rceil\rangle\ \text{'ijcar}]^{\cdot}$

$[\langle\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=0+\overline{a}\Rightarrow\overline{c}\cdot\overline{d}=0+\overline{c}\cdot\overline{d}\rceil\equiv^0\lceil\forall_{\mathrm{obj}}\overline{a}\colon\overline{a}=0+\overline{a}\Rightarrow\overline{b}=0+\overline{b}\rceil||\lceil\overline{b}\rceil:=\lceil\overline{c}\cdot\overline{d}\rceil\rangle\ \text{'ijcar}]^{\cdot}$

$[\langle\lceil\forall_{\mathrm{obj}}\overline{\mathsf{a}}\colon\overline{\mathsf{a}}=0+\overline{\mathsf{a}}\Rightarrow\overline{\mathsf{b}}=0+\overline{\mathsf{b}}\rceil\equiv^{0}\lceil\forall_{\mathrm{obj}}\overline{\mathsf{a}}\colon\overline{\mathsf{a}}=0+\overline{\mathsf{a}}\Rightarrow\overline{\mathsf{b}}=0+\overline{\mathsf{b}}\rceil\,|\,\lceil\overline{\mathsf{a}}\rceil:=\lceil\overline{\mathsf{c}}\rceil\rangle\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\rceil,\lceil 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\rceil,\lceil 1\rceil)\,\text{'ijcar}]^{-}$

$[\mathrm{Ded}_8(\lceil\forall\underline{\mathsf{a}}\colon\underline{\mathsf{a}}\rceil,\mathsf{T})]^{\cdot}$

$[\mathrm{Ded}_7(\lceil\forall\underline{\mathsf{a}}\colon\underline{\mathsf{a}}\rceil)\stackrel{\mathrm{t}}{=}\lceil\underline{\mathsf{a}}\rceil]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\underline{\mathsf{a}}\rceil,\lceil\underline{\mathsf{a}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\underline{\mathsf{a}}\rceil,\lceil\underline{\mathsf{b}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\underline{\mathsf{a}}\rceil,\lceil\underline{\mathsf{b}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{b}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{a}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\rceil,\lceil\underline{\mathsf{b}}\Rightarrow\underline{\mathsf{b}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\rceil,\lceil 0\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{a}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\forall\underline{\mathsf{c}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\vdash\underline{\mathsf{c}}\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{b}}\Rightarrow\underline{\mathsf{c}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\vdash\underline{\mathsf{a}}\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{b}}\Rightarrow\underline{\mathsf{c}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall\underline{\mathsf{a}}\colon\forall\underline{\mathsf{b}}\colon\forall\underline{\mathsf{c}}\colon\underline{\mathsf{a}}\vdash\underline{\mathsf{b}}\vdash\underline{\mathsf{c}}\rceil,\lceil\underline{\mathsf{a}}\Rightarrow\underline{\mathsf{b}}\Rightarrow\underline{\mathsf{c}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\rceil,\lceil\overline{\mathsf{x}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\rceil,\lceil 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\rceil,\lceil\overline{\mathsf{x}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall_{\mathrm{obj}}\overline{\mathsf{x}}\colon\overline{\mathsf{x}}\rceil,\lceil\overline{\mathsf{x}}\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\rceil,\lceil\forall_{\mathrm{obj}}\overline{\mathsf{y}}\colon\overline{\mathsf{z}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\forall_{\mathrm{obj}}\overline{\mathsf{x}}\colon\overline{\mathsf{x}}\rceil,\lceil\forall_{\mathrm{obj}}\overline{\mathsf{x}}\colon\overline{\mathsf{x}}\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\vdash 0\rceil,\lceil 0\Rightarrow 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\vdash 0\rceil,\lceil 0\Rightarrow 0\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\vdash\overline{\mathsf{x}}\rceil,\lceil 0\Rightarrow 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\vdash\overline{\mathsf{x}}\rceil,\lceil 0\Rightarrow 0\rceil)\,\text{'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0\vdash 0\rceil,\lceil\forall_{\mathrm{obj}}\overline{\mathsf{x}}\colon 0\Rightarrow 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil\overline{\mathsf{x}}\vdash 0\rceil,\lceil\forall_{\mathrm{obj}}\overline{\mathsf{x}}\colon\overline{\mathsf{x}}\Rightarrow 0\rceil)\,\text{'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0 \vdash \overline{x}\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon 0 \Rightarrow \overline{x}\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} \vdash \overline{x}\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon \overline{x} \Rightarrow \overline{x}\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0 \vdash 0\rceil, \lceil 0 \Rightarrow \forall_{\mathrm{obj}}\overline{x}\colon 0\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} \vdash 0\rceil, \lceil 0 \Rightarrow \forall_{\mathrm{obj}}\overline{x}\colon 0\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0 \vdash \overline{x}\rceil, \lceil 0 \Rightarrow \forall_{\mathrm{obj}}\overline{y}\colon \overline{z}\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} \vdash \overline{x}\rceil, \lceil 0 \Rightarrow \forall_{\mathrm{obj}}\overline{x}\colon \overline{x}\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0 \vdash 0\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon 0 \Rightarrow \forall_{\mathrm{obj}}\overline{x}\colon 0\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} \vdash 0\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon \overline{x} \Rightarrow \forall_{\mathrm{obj}}\overline{x}\colon 0\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil 0 \vdash \overline{x}\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon 0 \Rightarrow 2\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} \vdash \overline{x}\rceil, \lceil \forall_{\mathrm{obj}}\overline{x}\colon \overline{x} \Rightarrow 3\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} + \overline{y} = \overline{y} + \overline{x}\rceil, \lceil 2 + 3 = 3 + 2\rceil)\text{ 'ijcar}]^{\cdot}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} + \overline{y} = \overline{y} + \overline{x}\rceil, \lceil 2 + 3 = 2 + 3\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} + \overline{y} = \overline{y} + \overline{x}\rceil, \lceil 2 + 3 = 2 + 2\rceil)\text{ 'ijcar}]^{-}$

$[\lambda x.\mathrm{Ded}_0(\lceil \overline{x} + \overline{y} = \overline{y} + \overline{x}\rceil, \lceil 2 + 3 = 3 + 3\rceil)\text{ 'ijcar}]^{-}$

# 2 Pyk definitions

$[[x \stackrel{\circ}{=} y] \overset{\mathrm{pyk}}{\rightarrow}$ "general macro define $*$ as $*$ end define"$]$

$[\mathrm{RootVisible}(x) \overset{\mathrm{pyk}}{\rightarrow}$ "make root visible $*$ end visible"$]$

$[\mathrm{ijcar} \overset{\mathrm{pyk}}{\rightarrow}$ "ijcar"$]$

$[x^{\mathrm{hide}} \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ hide"$]$

$[x' \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ suc"$]$

$[x = y \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ equal $*$"$]$

$[x \neq y \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ unequal $*$"$]$

$[x \Rightarrow y \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ imply $*$"$]$

$[x \Leftrightarrow y \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ if and only if $*$"$]$

$[x \mid y \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ alternative $*$"$]$

$[\exists \mathsf{x}\colon \mathsf{y} \overset{\text{pyk}}{\to} \text{“exist } * \text{ indeed } *\text{”}]$

$[\forall \mathsf{x}\colon \mathsf{y} \overset{\text{pyk}}{\to} \text{“for all } * \text{ indeed } *\text{”}]$

$[\forall_{\text{obj}} \mathsf{x}\colon \mathsf{y} \overset{\text{pyk}}{\to} \text{“for all objects } * \text{ indeed } *\text{”}]$

$[\Pi \mathsf{x}\colon \mathsf{y} \overset{\text{pyk}}{\to} \text{“for all terms } * \text{ indeed } *\text{”}]$

$[\text{Arbitrary} \gg \mathsf{i}; \mathsf{p} \overset{\text{pyk}}{\to} \text{“any term } * \text{ end line } *\text{”}]$

$[\mathsf{x} \backslash\backslash \mathsf{y} \overset{\text{pyk}}{\to} \text{“} * \text{ safe row } *\text{”}]$

$[\text{A} \overset{\text{pyk}}{\to} \text{“ijcar example axiom”}]$

$[\text{R} \overset{\text{pyk}}{\to} \text{“ijcar example rule”}]$

$[\text{C} \overset{\text{pyk}}{\to} \text{“ijcar example contradiction”}]$

$[\text{T} \overset{\text{pyk}}{\to} \text{“ijcar example theory”}]$

$[\text{L} \overset{\text{pyk}}{\to} \text{“ijcar example lemma”}]$

$[\{\mathsf{x}\} \overset{\text{pyk}}{\to} \text{“set } * \text{ end set”}]$

$[\text{S} \overset{\text{pyk}}{\to} \text{“system s”}]$

$[\text{Neg} \overset{\text{pyk}}{\to} \text{“double negation”}]$

$[\text{S1} \overset{\text{pyk}}{\to} \text{“axiom s one”}]$

$[\text{S2} \overset{\text{pyk}}{\to} \text{“axiom s two”}]$

$[\text{S3} \overset{\text{pyk}}{\to} \text{“axiom s three”}]$

$[\text{S4} \overset{\text{pyk}}{\to} \text{“axiom s four”}]$

$[\text{S5} \overset{\text{pyk}}{\to} \text{“axiom s five”}]$

$[\text{S6} \overset{\text{pyk}}{\to} \text{“axiom s six”}]$

$[\text{S7} \overset{\text{pyk}}{\to} \text{“axiom s seven”}]$

$[\text{S8} \overset{\text{pyk}}{\to} \text{“axiom s eight”}]$

$[\text{S9} \overset{\text{pyk}}{\to} \text{“axiom s nine”}]$

$[\text{MP} \overset{\text{pyk}}{\to} \text{“rule mp”}]$

$[\mathrm{Gen} \overset{\mathrm{pyk}}{\to} \text{“rule gen”}]$

$[\mathrm{Ded} \overset{\mathrm{pyk}}{\to} \text{“deduction”}]$

$[\mathrm{Repetition} \overset{\mathrm{pyk}}{\to} \text{“repetition”}]$

$[\mathrm{A1}' \overset{\mathrm{pyk}}{\to} \text{“lemma a one”}]$

$[\mathrm{A2}' \overset{\mathrm{pyk}}{\to} \text{“lemma a two”}]$

$[\mathrm{A4}' \overset{\mathrm{pyk}}{\to} \text{“lemma a four”}]$

$[\mathrm{A5}' \overset{\mathrm{pyk}}{\to} \text{“lemma a five”}]$

$[\mathsf{x}^{\mathrm{var}} \overset{\mathrm{pyk}}{\to} \text{“}*\text{ is object var”}]$

$[\mathsf{x}\#\mathsf{y} \overset{\mathrm{pyk}}{\to} \text{“}*\text{ avoid }*\text{”}]$

$[\mathsf{x}\#^0\mathsf{y} \overset{\mathrm{pyk}}{\to} \text{“}*\text{ avoid zero }*\text{”}]$

$[\mathsf{x}\#^1\mathsf{y} \overset{\mathrm{pyk}}{\to} \text{“}*\text{ avoid one }*\text{”}]$

$[\mathsf{x}\#^*\mathsf{y} \overset{\mathrm{pyk}}{\to} \text{“}*\text{ avoid star }*\text{”}]$

$[\langle \mathsf{x} \equiv \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{pyk}}{\to} \text{“sub }*\text{ is }*\text{ where }*\text{ is }*\text{ end sub”}]$

$[\langle \mathsf{x} \equiv^0 \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{pyk}}{\to} \text{“sub zero }*\text{ is }*\text{ where }*\text{ is }*\text{ end sub”}]$

$[\langle \mathsf{x} \equiv^1 \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{pyk}}{\to} \text{“sub one }*\text{ is }*\text{ where }*\text{ is }*\text{ end sub”}]$

$[\langle \mathsf{x} \equiv^* \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{pyk}}{\to} \text{“sub star }*\text{ is }*\text{ where }*\text{ is }*\text{ end sub”}]$

$[\mathrm{Ded}(\mathsf{x}, \mathsf{y}) \overset{\mathrm{pyk}}{\to} \text{“deduction }*\text{ conclude }*\text{ end deduction”}]$

$[\mathrm{Ded}_0(\mathsf{x}, \mathsf{y}) \overset{\mathrm{pyk}}{\to} \text{“deduction zero }*\text{ conclude }*\text{ end deduction”}]$

$[\mathrm{Ded}_1(\mathsf{x}, \mathsf{y}, \mathsf{z}) \overset{\mathrm{pyk}}{\to} \text{“deduction one }*\text{ conclude }*\text{ condition }*\text{ end deduction”}]$

$[\mathrm{Ded}_2(\mathsf{x}, \mathsf{y}, \mathsf{z}) \overset{\mathrm{pyk}}{\to} \text{“deduction two }*\text{ conclude }*\text{ condition }*\text{ end deduction”}]$

$[\mathrm{Ded}_3(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \overset{\mathrm{pyk}}{\to} \text{“deduction three }*\text{ conclude }*\text{ condition }*\text{ bound }*\text{ end deduction”}]$

$[\mathrm{Ded}_4(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \overset{\mathrm{pyk}}{\to} \text{“deduction four }*\text{ conclude }*\text{ condition }*\text{ bound }*\text{ end deduction”}]$

$[\mathrm{Ded}_4^*(\mathsf{x},\mathsf{y},\mathsf{z},\mathsf{u}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction four star $*$ conclude $*$ condition $*$ bound $*$ end deduction"$]$

$[\mathrm{Ded}_5(\mathsf{x},\mathsf{y},\mathsf{z}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction five $*$ condition $*$ bound $*$ end deduction"$]$

$[\mathrm{Ded}_6(\mathsf{p},\mathsf{c},\mathsf{e},\mathsf{b}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction six $*$ conclude $*$ exception $*$ bound $*$ end deduction"$]$

$[\mathrm{Ded}_6^*(\mathsf{p},\mathsf{c},\mathsf{e},\mathsf{b}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction six star $*$ conclude $*$ exception $*$ bound $*$ end deduction"$]$

$[\mathrm{Ded}_7(\mathsf{p}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction seven $*$ end deduction"$]$

$[\mathrm{Ded}_8(\mathsf{p},\mathsf{b}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction eight $*$ bound $*$ end deduction"$]$

$[\mathrm{Ded}_8^*(\mathsf{p},\mathsf{b}) \overset{\mathrm{pyk}}{\rightarrow}$ "deduction eight $*$ bound $*$ end deduction"$]$

$[\mathrm{Begin}\,\mathsf{b};\mathsf{l}:\mathrm{End};\mathsf{p} \overset{\mathrm{pyk}}{\rightarrow}$ "block $*$ line $*$ end block $*$"$]$

$[\mathrm{Last\ block\ line}\,\mathsf{l} \gg \mathsf{i}\,; \overset{\mathrm{pyk}}{\rightarrow}$ "because $*$ indeed $*$ end line"$]$

$[\mathsf{x} \trianglerighteq \mathsf{y} \overset{\mathrm{pyk}}{\rightarrow}$ "$*$ object modus ponens $*$"$]$

$[\mathrm{Prop\ 3.2a} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two a"$]$

$[\mathrm{Prop\ 3.2b} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two b"$]$

$[\mathrm{Prop\ 3.2c} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two c"$]$

$[\mathrm{Prop\ 3.2d} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two d"$]$

$[\mathrm{Prop\ 3.2e_1} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two e one"$]$

$[\mathrm{Prop\ 3.2e_2} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two e two"$]$

$[\mathrm{Prop\ 3.2e} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two e"$]$

$[\mathrm{Prop\ 3.2f_1} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two f one"$]$

$[\mathrm{Prop\ 3.2f_2} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two f two"$]$

$[\mathrm{Prop\ 3.2f} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two f"$]$

$[\mathrm{Prop\ 3.2g_1} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two g one"$]$

$[\mathrm{Prop\ 3.2g_2} \overset{\mathrm{pyk}}{\rightarrow}$ "prop three two g two"$]$

[Prop 3.2g $\overset{\text{pyk}}{\to}$ “prop three two g”]

[Prop 3.2h$_1$ $\overset{\text{pyk}}{\to}$ “prop three two h one”]

[Prop 3.2h$_2$ $\overset{\text{pyk}}{\to}$ “prop three two h two”]

[Prop 3.2h $\overset{\text{pyk}}{\to}$ “prop three two h”]

[MacroIndent(x) $\overset{\text{pyk}}{\to}$ “macro indent $*$”]

[Block$_1$(t, s, c) $\overset{\text{pyk}}{\to}$ “block one $*$ state $*$ cache $*$ end block”]

[Block$_2$(b) $\overset{\text{pyk}}{\to}$ “block two $*$ end block”]

[$\to \overset{\text{pyk}}{\to}$ “evaluates to”]

# 3 TEX definitions

[[x $\overset{\circ}{=}$ y] $\overset{\text{tex}}{\to}$ “
[#1/tex name/tex.
\stackrel {\circ}{=}#2.
]”]

[RootVisible(x) $\overset{\text{tex}}{\to}$ “#1/tex name/tex.”]

[RootVisible(x) $\overset{\text{name}}{\to}$ “
RootVisible(#1.
)”]

[x$^{\text{hide}}$ $\overset{\text{tex}}{\to}$ “#1.
{}^{hide}”]

[x$'$ $\overset{\text{tex}}{\to}$ “#1.
{}’”]

[x = y $\overset{\text{tex}}{\to}$ “#1.
= #2.”]

[x $\neq$ y $\overset{\text{tex}}{\to}$ “#1.
\neq #2.”]

[x $\Rightarrow$ y $\overset{\text{tex}}{\to}$ “#1.
\Rightarrow #2.”]

[x $\Leftrightarrow$ y $\overset{\text{tex}}{\to}$ “#1.
\Leftrightarrow #2.”]

```
[x | y ↦tex "#1.
            \mathrel{|} #2."]

[∃x: y ↦tex "
            \exists #1.
            \colon #2."]

[∀x: y ↦tex "
            \forall #1.
            \colon #2."]

[∀_obj x: y ↦tex "
            \forall_{obj} #1.
            \colon #2."]

[Πx: y ↦tex "
            \Pi #1.
            \colon #2."]

[Arbitrary ≫ i; p ↦tex "
            \newline \makebox [0.1\textwidth ][l]{$
            \if \relax \csname lgwprooflinep\endcsname L_? \else
            \global \advance \lgwproofline by 1
            L\ifnum \lgwproofline <10 0\fi \number \lgwproofline
            \fi
            $:}\makebox [0.4\textwidth ][l]{$Arbitrary{}\gg{}$}\quad
            \parbox [t]{0.4\textwidth }{$#1.
            $\hfill \makebox [0mm][l]{\quad ;}}#2."]

[Arbitrary ≫ i; p ↦name "
            Arbitrary \gg #1.
            ;#2."]

[x\\y ↦tex "#1.
            \\{}#2."]

[x\\y ↦name "#1.
            \backslash \backslash #2."]

[A ↦tex "
            A"]

[R ↦tex "
            R"]

[C ↦tex "
            C"]
```

[T $\overset{\text{tex}}{\to}$ “
T”]

[L $\overset{\text{tex}}{\to}$ “
L”]

[{x} $\overset{\text{tex}}{\to}$ “
\{#1.
\}”]

[S $\overset{\text{tex}}{\to}$ “
S”]

[Neg $\overset{\text{tex}}{\to}$ “
Neg”]

[S1 $\overset{\text{tex}}{\to}$ “
S1”]

[S2 $\overset{\text{tex}}{\to}$ “
S2”]

[S3 $\overset{\text{tex}}{\to}$ “
S3”]

[S4 $\overset{\text{tex}}{\to}$ “
S4”]

[S5 $\overset{\text{tex}}{\to}$ “
S5”]

[S6 $\overset{\text{tex}}{\to}$ “
S6”]

[S7 $\overset{\text{tex}}{\to}$ “
S7”]

[S8 $\overset{\text{tex}}{\to}$ “
S8”]

[S9 $\overset{\text{tex}}{\to}$ “
S9”]

[MP $\overset{\text{tex}}{\to}$ “
MP”]

[Gen $\overset{\text{tex}}{\to}$ “
Gen”]

$[\mathrm{Ded} \overset{\mathrm{tex}}{\to} \text{“}$
Ded”]

$[\mathrm{Repetition} \overset{\mathrm{tex}}{\to} \text{“}$
Repetition”]

$[\mathrm{A1}' \overset{\mathrm{tex}}{\to} \text{“}$
A1’”]

$[\mathrm{A2}' \overset{\mathrm{tex}}{\to} \text{“}$
A2’”]

$[\mathrm{A4}' \overset{\mathrm{tex}}{\to} \text{“}$
A4’”]

$[\mathrm{A5}' \overset{\mathrm{tex}}{\to} \text{“}$
A5’”]

$[\mathsf{x}^{\mathrm{var}} \overset{\mathrm{tex}}{\to} \text{“}$#1.
{}^{var}”]

$[\mathsf{x}\#\mathsf{y} \overset{\mathrm{tex}}{\to} \text{“}$#1.
\#.#2.”]

$[\mathsf{x}\#^{0}\mathsf{y} \overset{\mathrm{tex}}{\to} \text{“}$#1.
\#.^0#2.”]

$[\mathsf{x}\#^{1}\mathsf{y} \overset{\mathrm{tex}}{\to} \text{“}$#1.
\#.^1#2.”]

$[\mathsf{x}\#^{*}\mathsf{y} \overset{\mathrm{tex}}{\to} \text{“}$#1.
\#.^*#2.”]

$[\langle \mathsf{x} \equiv \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{tex}}{\to} \text{“}$
\langle #1.
{\equiv} #2.
| #3.
{:=} #4.
\rangle ”]

$[\langle \mathsf{x} \equiv^{0} \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\mathrm{tex}}{\to} \text{“}$
\langle #1.
{\equiv}^0 #2.
| #3.
{:=} #4.
\rangle ”]

$[\langle \mathsf{x} \equiv^1 \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\text{tex}}{\to} \text{“}$
\langle #1.
{\equiv}^1 #2.
| #3.
{:=} #4.
\rangle ”]

$[\langle \mathsf{x} \equiv^* \mathsf{y} | \mathsf{z} := \mathsf{u} \rangle \overset{\text{tex}}{\to} \text{“}$
\langle #1.
{\equiv}^* #2.
| #3.
{:=} #4.
\rangle ”]

$[\mathrm{Ded}(\mathsf{x}, \mathsf{y}) \overset{\text{tex}}{\to} \text{“}$
Ded(#1.
, #2.
)”]

$[\mathrm{Ded}_0(\mathsf{x}, \mathsf{y}) \overset{\text{tex}}{\to} \text{“}$
Ded_0(#1.
, #2.
)”]

$[\mathrm{Ded}_1(\mathsf{x}, \mathsf{y}, \mathsf{z}) \overset{\text{tex}}{\to} \text{“}$
Ded_1(#1.
, #2.
, #3.
)”]

$[\mathrm{Ded}_2(\mathsf{x}, \mathsf{y}, \mathsf{z}) \overset{\text{tex}}{\to} \text{“}$
Ded_2(#1.
, #2.
, #3.
)”]

$[\mathrm{Ded}_3(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \overset{\text{tex}}{\to} \text{“}$
Ded_3(#1.
, #2.
, #3.
, #4.
)”]

$[\mathrm{Ded}_4(\mathsf{x}, \mathsf{y}, \mathsf{z}, \mathsf{u}) \overset{\text{tex}}{\to} \text{“}$
Ded_4(#1.
, #2.
, #3.

$$
\begin{array}{l}
\quad , \#4. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_4^*(\mathsf{x},\mathsf{y},\mathsf{z},\mathsf{u}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_4\hat{}}*(\#1. \\
\quad , \#2. \\
\quad , \#3. \\
\quad , \#4. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_5(\mathsf{x},\mathsf{y},\mathsf{z}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_5}(\#1. \\
\quad , \#2. \\
\quad , \#3. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_6(\mathsf{p},\mathsf{c},\mathsf{e},\mathsf{b}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_6}(\#1. \\
\quad , \#2. \\
\quad , \#3. \\
\quad , \#4. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_6^*(\mathsf{p},\mathsf{c},\mathsf{e},\mathsf{b}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_6\hat{}}*(\#1. \\
\quad , \#2. \\
\quad , \#3. \\
\quad , \#4. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_7(\mathsf{p}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_7}(\#1. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_8(\mathsf{p},\mathsf{b}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_8}(\#1. \\
\quad , \#2. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Ded}_8^*(\mathsf{p},\mathsf{b}) \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \mathrm{Ded\_8\hat{}}*(\#1. \\
\quad , \#2. \\
\quad )"]
\end{array}
$$

$$
\begin{array}{l}
[\mathrm{Begin}\,\mathsf{b};\mathsf{l} : \mathrm{End};\mathsf{p} \overset{\mathrm{tex}}{\rightarrow} \text{“} \\
\quad \backslash\mathrm{newline}\ \backslash\mathrm{makebox}\ [0.1\backslash\mathrm{textwidth}]\{\}\% \\
\quad \backslash\mathrm{parbox}\ [\mathrm{b}]\{0.4\backslash\mathrm{textwidth}\ \}\{\backslash\mathrm{raggedright}
\end{array}
$$

\setlength {\parindent }{-0.1\textwidth }%
\makebox [0.1\textwidth ][l]{$
\if \relax \csname lgwproofinep\endcsname L_? \else
\global \advance \lgwproofline by 1
L\ifnum \lgwproofline <10 0\fi \number \lgwproofline
\fi
$:}$Block {}\gg {}$}\quad
\parbox [t]{0.4\textwidth }{$Begin
$\hfill \makebox [0mm][l]{\quad ;}}#1.
\newline \makebox [0.1\textwidth]{}%
\parbox [b]{0.4\textwidth }{\raggedright
\setlength {\parindent }{-0.1\textwidth }%
\makebox [0.1\textwidth ][l]{$#2.
$:}$Block {}\gg {}$}\quad
\parbox [t]{0.4\textwidth }{$End
$\hfill \makebox [0mm][l]{\quad ;}}#3."]

[Begin $\mathsf{b}$; $\mathsf{l}$ : End; $\mathsf{p}$ $\overset{\text{name}}{\to}$ "
Begin \, #1.
; #2.
: End ; #3."]

[Last block line $\mathsf{a} \gg \mathsf{i}$ ; $\overset{\text{tex}}{\to}$ "
\newline \makebox [0.1\textwidth]{}%
\parbox [b]{0.4\textwidth }{\raggedright
\setlength {\parindent }{-0.1\textwidth }%
\makebox [0.1\textwidth ][l]{$
\if \relax \csname lgwproofinep\endcsname L_? \else
\global \advance \lgwproofline by 1
L\ifnum \lgwproofline <10 0\fi \number \lgwproofline
\fi
$:}$#1.
{}\gg {}$}\quad
\parbox [t]{0.4\textwidth }{$#2.
$\hfill \makebox [0mm][l]{\quad ;}}"]

[Last block line $\mathsf{a} \gg \mathsf{i}$ ; $\overset{\text{name}}{\to}$ "
Last\ block\ line \, #1.
\gg #2.
\, ; "]

[$\mathsf{x} \trianglerighteq \mathsf{y}$ $\overset{\text{tex}}{\to}$ "#1.
\unrhd #2."]

[Prop 3.2a $\overset{\text{tex}}{\to}$ "
Prop\ 3.2a"]

[Prop 3.2b $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2b”]

[Prop 3.2c $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2c”]

[Prop 3.2d $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2d”]

[Prop 3.2e$_1$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2e_1”]

[Prop 3.2e$_2$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2e_2”]

[Prop 3.2e $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2e”]

[Prop 3.2f$_1$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2f_1”]

[Prop 3.2f$_2$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2f_2”]

[Prop 3.2f $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2f”]

[Prop 3.2g$_1$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2g_1”]

[Prop 3.2g$_2$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2g_2”]

[Prop 3.2g $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2g”]

[Prop 3.2h$_1$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2h_1”]

[Prop 3.2h$_2$ $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2h_2”]

[Prop 3.2h $\overset{\text{tex}}{\rightarrow}$ “
Prop\ 3.2h”]

[MacroIndent(x) $\overset{\text{tex}}{\rightarrow}$ “
$%
\leftskip=1em%
$#1.”]

$[\mathrm{MacroIndent}(\mathsf{x}) \overset{\text{name}}{\to} \text{“}$
MacroIndent(#1.
)”]

$[\mathrm{Block}_1(\mathsf{t},\mathsf{s},\mathsf{c}) \overset{\text{tex}}{\to} \text{“}$
Block_1(#1.
, #2.
, #3.
)”]

$[\mathrm{Block}_2(\mathsf{b}) \overset{\text{tex}}{\to} \text{“}$
Block_2(#1.
)”]

$[\to \overset{\text{tex}}{\to} \text{“}$
\rightarrow ”]

## 3.1 Variables

$[\overline{\mathsf{x}} \overset{\text{pyk}}{\to} \text{“object var} * \text{end var”}]$

$[\overline{\mathsf{x}} \overset{\text{tex}}{\to} \text{“\overline\{\#1.\}”}]$

$[a \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[a \doteq \overline{\mathsf{a}}]\rceil)]$

$[b \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[b \doteq \overline{\mathsf{b}}]\rceil)]$

$[c \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[c \doteq \overline{\mathsf{c}}]\rceil)]$

$[d \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[d \doteq \overline{\mathsf{d}}]\rceil)]$

$[e \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[e \doteq \overline{\mathsf{e}}]\rceil)]$

$[f \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[f \doteq \overline{\mathsf{f}}]\rceil)]$

$[g \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[g \doteq \overline{\mathsf{g}}]\rceil)]$

$[h \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[h \doteq \overline{\mathsf{h}}]\rceil)]$

$[i \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[i \doteq \overline{\mathsf{i}}]\rceil)]$

$[j \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[j \doteq \overline{\mathsf{j}}]\rceil)]$

$[k \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[k \doteq \overline{\mathsf{k}}]\rceil)]$

$[l \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[l \doteq \overline{\mathsf{l}}]\rceil)]$

$[m \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[m \doteq \overline{\mathsf{m}}]\rceil)]$

$[n \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[n \doteq \overline{\mathsf{n}}]\rceil)]$

$[o \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[o \doteq \overline{\mathsf{o}}]\rceil)]$

$[p \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[p \doteq \overline{\mathsf{p}}]\rceil)]$

$[q \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[q \doteq \overline{\mathsf{q}}]\rceil)]$

$[r \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[r \doteq \overline{\mathsf{r}}]\rceil)]$

$[s \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[s \doteq \overline{\mathsf{s}}]\rceil)]$

$[t \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[t \doteq \overline{\mathsf{t}}]\rceil)]$

$[u \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[u \doteq \overline{\mathsf{u}}]\rceil)]$

$[v \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[v \doteq \overline{\mathsf{v}}]\rceil)]$

$[w \overset{\text{macro}}{\to} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\lceil[w \doteq \overline{\mathsf{w}}]\rceil)]$

$[x \overset{\text{macro}}{\longrightarrow} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\ulcorner[x \doteqdot \overline{\mathsf{x}}]\urcorner)]$
$[y \overset{\text{macro}}{\longrightarrow} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\ulcorner[y \doteqdot \overline{\mathsf{y}}]\urcorner)]$
$[z \overset{\text{macro}}{\longrightarrow} \lambda\mathsf{t}.\lambda\mathsf{s}.\lambda\mathsf{c}.\tilde{\mathcal{M}}_4(\mathsf{t},\mathsf{s},\mathsf{c},\ulcorner[z \doteqdot \overline{\mathsf{z}}]\urcorner)]$
$[a \overset{\text{pyk}}{\longrightarrow}$ "object a"$]$
$[b \overset{\text{pyk}}{\longrightarrow}$ "object b"$]$
$[c \overset{\text{pyk}}{\longrightarrow}$ "object c"$]$
$[d \overset{\text{pyk}}{\longrightarrow}$ "object d"$]$
$[e \overset{\text{pyk}}{\longrightarrow}$ "object e"$]$
$[f \overset{\text{pyk}}{\longrightarrow}$ "object f"$]$
$[g \overset{\text{pyk}}{\longrightarrow}$ "object g"$]$
$[h \overset{\text{pyk}}{\longrightarrow}$ "object h"$]$
$[i \overset{\text{pyk}}{\longrightarrow}$ "object i"$]$
$[j \overset{\text{pyk}}{\longrightarrow}$ "object j"$]$
$[k \overset{\text{pyk}}{\longrightarrow}$ "object k"$]$
$[l \overset{\text{pyk}}{\longrightarrow}$ "object l"$]$
$[m \overset{\text{pyk}}{\longrightarrow}$ "object m"$]$
$[n \overset{\text{pyk}}{\longrightarrow}$ "object n"$]$
$[o \overset{\text{pyk}}{\longrightarrow}$ "object o"$]$
$[p \overset{\text{pyk}}{\longrightarrow}$ "object p"$]$
$[q \overset{\text{pyk}}{\longrightarrow}$ "object q"$]$
$[r \overset{\text{pyk}}{\longrightarrow}$ "object r"$]$
$[s \overset{\text{pyk}}{\longrightarrow}$ "object s"$]$
$[t \overset{\text{pyk}}{\longrightarrow}$ "object t"$]$
$[u \overset{\text{pyk}}{\longrightarrow}$ "object u"$]$
$[v \overset{\text{pyk}}{\longrightarrow}$ "object v"$]$
$[w \overset{\text{pyk}}{\longrightarrow}$ "object w"$]$
$[x \overset{\text{pyk}}{\longrightarrow}$ "object x"$]$
$[y \overset{\text{pyk}}{\longrightarrow}$ "object y"$]$
$[z \overset{\text{pyk}}{\longrightarrow}$ "object z"$]$
$[a \overset{\text{tex}}{\longrightarrow}$ "
\mathit{a}"$]$
$[b \overset{\text{tex}}{\longrightarrow}$ "
\mathit{b}"$]$
$[c \overset{\text{tex}}{\longrightarrow}$ "
\mathit{c}"$]$
$[d \overset{\text{tex}}{\longrightarrow}$ "
\mathit{d}"$]$

$[e \overset{\text{tex}}{\to} \text{“}\mathit{e}\text{”}]$

$[f \overset{\text{tex}}{\to} \text{“}\mathit{f}\text{”}]$

$[g \overset{\text{tex}}{\to} \text{“}\mathit{g}\text{”}]$

$[h \overset{\text{tex}}{\to} \text{“}\mathit{h}\text{”}]$

$[i \overset{\text{tex}}{\to} \text{“}\mathit{i}\text{”}]$

$[j \overset{\text{tex}}{\to} \text{“}\mathit{j}\text{”}]$

$[k \overset{\text{tex}}{\to} \text{“}\mathit{k}\text{”}]$

$[l \overset{\text{tex}}{\to} \text{“}\mathit{l}\text{”}]$

$[m \overset{\text{tex}}{\to} \text{“}\mathit{m}\text{”}]$

$[n \overset{\text{tex}}{\to} \text{“}\mathit{n}\text{”}]$

$[o \overset{\text{tex}}{\to} \text{“}\mathit{o}\text{”}]$

$[p \overset{\text{tex}}{\to} \text{“}\mathit{p}\text{”}]$

$[q \overset{\text{tex}}{\to} \text{“}\mathit{q}\text{”}]$

$[r \overset{\text{tex}}{\to} \text{“}\mathit{r}\text{”}]$

$[s \overset{\text{tex}}{\to} \text{“}\mathit{s}\text{”}]$

$[t \overset{\text{tex}}{\to} \text{“}\mathit{t}\text{”}]$

$[u \overset{\text{tex}}{\to} \text{“}\mathit{u}\text{”}]$

$[v \overset{\text{tex}}{\to} \text{“}\mathit{v}\text{”}]$

$[w \overset{\text{tex}}{\to} \text{“}\mathit{w}\text{”}]$

$[x \overset{\text{tex}}{\to} \text{“}\mathit{x}\text{”}]$

$[y \overset{\text{tex}}{\to} \text{“}$
\mathit{y}”]
$[z \overset{\text{tex}}{\to} \text{“}$
\mathit{z}”]

# 4 Priority table

[ijcar $\overset{\text{prio}}{\to}$
**Preassociative**
[ijcar], [ijcar base], [bracket $*$ end bracket], [big bracket $*$ end bracket], [ \$ $*$ \$ ], [**flush left** $[*]$], [x], [y], [z], $[[* \bowtie *]]$, $[[* \overset{*}{\to} *]]$, [pyk], [tex], [name], [prio], $[*]$, [T], [if$(*,*,*)$], $[[* \overset{*}{\Rightarrow} *]]$, [val], [claim], $[\bot]$, [f$(*)$], $[(*)^{\text{I}}]$, [F], [0], [1], [2], [3], [4], [5], [6], [7], [8], [9], [0], [1], [2], [3], [4], [5], [6], [7], [8], [9], [a], [b], [c], [d], [e], [f], [g], [h], [i], [j], [k], [l], [m], [n], [o], [p], [q], [r], [s], [t], [u], [v], [w], $[(*)^{\text{M}}]$, [If$(*,*,*)$], [array\{$*$\} $*$ end array], [l], [c], [r], [empty], $[\langle * \mid * := * \rangle]$, $[\mathcal{M}(*)]$, $[\tilde{\mathcal{U}}(*)]$, $[\mathcal{U}(*)]$, $[\mathcal{U}^{\text{M}}(*)]$, [**apply**$(*,*)$], [**apply**$_1(*,*)$], [identifier$(*)$], [identifier$_1(*,*)$], [array-plus$(*,*)$], [array-remove$(*,*,*)$], [array-put$(*,*,*,*)$], [array-add$(*,*,*,*,*)$], [bit$(*,*)$], [bit$_1(*,*)$], [rack], ["vector"], ["bibliography"], ["dictionary"], ["body"], ["codex"], ["expansion"], ["code"], ["cache"], ["diagnose"], ["pyk"], ["tex"], ["texname"], ["value"], ["message"], ["macro"], ["definition"], ["unpack"], ["claim"], ["priority"], ["lambda"], ["apply"], ["true"], ["if"], ["quote"], ["proclaim"], ["define"], ["introduce"], ["hide"], ["pre"], ["post"], $[\mathcal{E}(*,*,*)]$, $[\mathcal{E}_2(*,*,*,*,*)]$, $[\mathcal{E}_3(*,*,*,*)]$, $[\mathcal{E}_4(*,*,*,*)]$, [**lookup**$(*,*,*)$], [**abstract**$(*,*,*,*)$], $[\lceil * \rceil]$, $[\mathcal{M}(*,*,*)]$, $[\mathcal{M}_2(*,*,*,*)]$, $[\mathcal{M}^*(*,*,*)]$, [macro], $[\text{s}_0]$, [**zip**$(*,*)$], [**assoc**$_1(*,*,*)$], $[(*)^{\text{P}}]$, [self], $[[* \doteq *]]$, $[[* \doteq *]]$, $[[* \doteq *]]$, $[[* \overset{\text{pyk}}{=} *]]$, $[[* \overset{\text{tex}}{=} *]]$, $[[* \overset{\text{name}}{=} *]]$, [**Priority table**$[*]$], $[\tilde{\mathcal{M}}_1]$, $[\tilde{\mathcal{M}}_2(*)]$, $[\tilde{\mathcal{M}}_3(*)]$, $[\tilde{\mathcal{M}}_4(*,*,*,*)]$, $[\tilde{\mathcal{M}}(*,*,*)]$, $[\tilde{\mathcal{Q}}(*,*,*)]$, $[\tilde{\mathcal{Q}}_2(*,*,*)]$, $[\tilde{\mathcal{Q}}_3(*,*,*,*)]$, $[\tilde{\mathcal{Q}}^*(*,*,*)]$, $[(*)]$, $[(*)]$, [display$(*)$], [statement$(*)$], $[[*]^{\cdot}]$, $[[*]^{-}]$, [**aspect**$(*,*)$], [**aspect**$(*,*,*)$], $[\langle * \rangle]$, [**tuple**$_1(*)$], [**tuple**$_2(*)$], [let$_2(*,*)$], [let$_1(*,*)$], $[[* \overset{\text{claim}}{=} *]]$, [checker], [**check**$(*,*)$], [**check**$_2(*,*,*)$], [**check**$_3(*,*,*)$], [**check**$^*(*,*)$], [**check**$_2^*(*,*,*)$], $[[*]^{\cdot}]$, $[[*]^{-}]$, $[[*]^{\circ}]$, [msg], $[[* \overset{\text{msg}}{=} *]]$, [<stmt>], [stmt], $[[* \overset{\text{stmt}}{=} *]]$, [HeadNil$'$], [HeadPair$'$], [Transitivity$'$], $[\perp\!\!\!\perp]$, [Contra$'$], $[\text{T}'_{\text{E}}]$, $[\text{L}_1]$, $[\underline{*}]$, $[\mathcal{A}]$, $[\mathcal{B}]$, $[\mathcal{C}]$, $[\mathcal{D}]$, $[\mathcal{E}]$, $[\mathcal{F}]$, $[\mathcal{G}]$, $[\mathcal{H}]$, $[\mathcal{I}]$, $[\mathcal{J}]$, $[\mathcal{K}]$, $[\mathcal{L}]$, $[\mathcal{M}]$, $[\mathcal{N}]$, $[\mathcal{O}]$, $[\mathcal{P}]$, $[\mathcal{Q}]$, $[\mathcal{R}]$, $[\mathcal{S}]$, $[\mathcal{T}]$, $[\mathcal{U}]$, $[\mathcal{V}]$, $[\mathcal{W}]$, $[\mathcal{X}]$, $[\mathcal{Y}]$, $[\mathcal{Z}]$, $[\langle * \mid * := * \rangle]$, $[\langle {}^* * \mid * := * \rangle]$, $[\emptyset]$, [Remainder], $[(*)^{\text{v}}]$, [intro$(*,*,*,*)$], [intro$(*,*,*)$], [error$(*,*)$], [error$_2(*,*)$], [proof$(*,*,*)$], [proof$_2(*,*)$], $[\mathcal{S}(*,*)]$, $[\mathcal{S}^{\text{I}}(*,*)]$, $[\mathcal{S}^{\triangleright}(*,*)]$, $[\mathcal{S}_1^{\triangleright}(*,*,*)]$, $[\mathcal{S}^{\text{E}}(*,*)]$, $[\mathcal{S}_1^{\text{E}}(*,*,*)]$, $[\mathcal{S}^+(*,*)]$, $[\mathcal{S}_1^+(*,*,*)]$, $[\mathcal{S}^-(*,*)]$, $[\mathcal{S}_1^-(*,*,*)]$, $[\mathcal{S}^*(*,*)]$, $[\mathcal{S}_1^*(*,*,*)]$, $[\mathcal{S}_2^*(*,*,*,*)]$, $[\mathcal{S}^{@}(*,*)]$, $[\mathcal{S}_1^{@}(*,*,*)]$, $[\mathcal{S}^{\vdash}(*,*)]$, $[\mathcal{S}_1^{\vdash}(*,*,*,*)]$, $[\mathcal{S}^{\Vdash}(*,*)]$, $[\mathcal{S}_1^{\Vdash}(*,*,*,*)]$, $[\mathcal{S}^{\text{i.e.}}(*,*)]$, $[\mathcal{S}_1^{\text{i.e.}}(*,*,*,*)]$, $[\mathcal{S}_2^{\text{i.e.}}(*,*,*,*,*)]$, $[\mathcal{S}^{\forall}(*,*)]$, $[\mathcal{S}_1^{\forall}(*,*,*,*)]$, $[\mathcal{S}^{\cdot}(*,*)]$, $[\mathcal{S}_1^{\cdot}(*,*,*)]$, $[\mathcal{S}_2^{\cdot}(*,*,*,*)]$, $[\mathcal{T}(*)]$, [claims$(*,*,*)$], [claims$_2(*,*,*)$], [<proof>], [proof], [[**Lemma** $*$: $*$]], [[**Proof of** $*$: $*$]], [[$*$ **lemma** $*$: $*$]], [[$*$ **antilemma** $*$: $*$]], [[$*$ **rule** $*$: $*$]], [[$*$ **antirule** $*$: $*$]], [verifier], $[\mathcal{V}_1(*)]$, $[\mathcal{V}_2(*,*)]$, $[\mathcal{V}_3(*,*,*,*)]$, $[\mathcal{V}_4(*,*)]$, $[\mathcal{V}_5(*,*,*,*)]$, $[\mathcal{V}_6(*,*,*,*)]$,

$[\mathcal{V}_7(*,*,*,*)]$, [Cut$(*,*)$], [Head$_{\oplus}(*)$], [Tail$_{\oplus}(*)$], [rule$_1(*,*)$], [rule$(*,*)$], [Rule tactic], [Plus$(*,*)$], [[**Theory** $*$]], [theory$_2(*,*)$], [theory$_3(*,*)$], [theory$_4(*,*,*)$], [HeadNil$''$], [HeadPair$''$], [Transitivity$''$], [Contra$''$], [HeadNil], [HeadPair], [Transitivity], [Contra], [T$_{\mathrm{E}}$], [ragged right], [ragged right expansion ], [parm$(*,*,*)$], [parm$^*(*,*,*)$], [inst$(*,*)$], [inst$^*(*,*)$], [occur$(*,*,*)$], [occur$^*(*,*,*)$], [unify$(*=*,*)$], [unify$^*(*=*,*)$], [unify$_2(*=*,*)$], [L$_{\mathrm{a}}$], [L$_{\mathrm{b}}$], [L$_{\mathrm{c}}$], [L$_{\mathrm{d}}$], [L$_{\mathrm{e}}$], [L$_{\mathrm{f}}$], [L$_{\mathrm{g}}$], [L$_{\mathrm{h}}$], [L$_{\mathrm{i}}$], [L$_{\mathrm{j}}$], [L$_{\mathrm{k}}$], [L$_{\mathrm{l}}$], [L$_{\mathrm{m}}$], [L$_{\mathrm{n}}$], [L$_{\mathrm{o}}$], [L$_{\mathrm{p}}$], [L$_{\mathrm{q}}$], [L$_{\mathrm{r}}$], [L$_{\mathrm{s}}$], [L$_{\mathrm{t}}$], [L$_{\mathrm{u}}$], [L$_{\mathrm{v}}$], [L$_{\mathrm{w}}$], [L$_{\mathrm{x}}$], [L$_{\mathrm{y}}$], [L$_{\mathrm{z}}$], [L$_{\mathrm{A}}$], [L$_{\mathrm{B}}$], [L$_{\mathrm{C}}$], [L$_{\mathrm{D}}$], [L$_{\mathrm{E}}$], [L$_{\mathrm{F}}$], [L$_{\mathrm{G}}$], [L$_{\mathrm{H}}$], [L$_{\mathrm{I}}$], [L$_{\mathrm{J}}$], [L$_{\mathrm{K}}$], [L$_{\mathrm{L}}$], [L$_{\mathrm{M}}$], [L$_{\mathrm{N}}$], [L$_{\mathrm{O}}$], [L$_{\mathrm{P}}$], [L$_{\mathrm{Q}}$], [L$_{\mathrm{R}}$], [L$_{\mathrm{S}}$], [L$_{\mathrm{T}}$], [L$_{\mathrm{U}}$], [L$_{\mathrm{V}}$], [L$_{\mathrm{W}}$], [L$_{\mathrm{X}}$], [L$_{\mathrm{Y}}$], [L$_{\mathrm{Z}}$], [L$_?$], [Reflexivity], [Reflexivity$_1$], [Commutativity], [Commutativity$_1$], [<tactic>], [tactic], $[[* \overset{\text{tactic}}{=} *]]$, $[\mathcal{P}(*,*,*)]$, $[\mathcal{P}^*(*,*,*)]$, [p$_0$], [conclude$_1(*,*)$], [conclude$_2(*,*,*)$], [conclude$_3(*,*,*,*)$], [conclude$_4(*,*)$], $[[* \overset{\circ}{=} *]]$, [RootVisible$(*)$], [A], [R], [C], [T], [L], [{$*$}], $[\overline{*}]$, [$a$], [$b$], [$c$], [$d$], [$e$], [$f$], [$g$], [$h$], [$i$], [$j$], [$k$], [$l$], [$m$], [$n$], [$o$], [$p$], [$q$], [$r$], [$s$], [$t$], [$u$], [$v$], [$w$], [$x$], [$y$], [$z$], $[\langle * \equiv * \mid * := * \rangle]$, $[\langle * \equiv^0 * \mid * := * \rangle]$, $[\langle * \equiv^1 * \mid * := * \rangle]$, $[\langle * \equiv^* * \mid * := * \rangle]$, [Ded$(*,*)$], [Ded$_0(*,*)$], [Ded$_1(*,*,*)$], [Ded$_2(*,*,*)$], [Ded$_3(*,*,*,*)$], [Ded$_4(*,*,*,*)$], [Ded$_4^*(*,*,*,*)$], [Ded$_5(*,*,*)$], [Ded$_6(*,*,*,*)$], [Ded$_6^*(*,*,*,*)$], [Ded$_7(*)$], [Ded$_8(*,*)$], [Ded$_8^*(*,*)$], [S], [Neg], [MP], [Gen], [Ded], [S1], [S2], [S3], [S4], [S5], [S6], [S7], [S8], [S9], [Repetition], [A1$'$], [A2$'$], [A4$'$], [A5$'$], [Prop 3.2a], [Prop 3.2b], [Prop 3.2c], [Prop 3.2d], [Prop 3.2e$_1$], [Prop 3.2e$_2$], [Prop 3.2e], [Prop 3.2f$_1$], [Prop 3.2f$_2$], [Prop 3.2f], [Prop 3.2g$_1$], [Prop 3.2g$_2$], [Prop 3.2g], [Prop 3.2h$_1$], [Prop 3.2h$_2$], [Prop 3.2h], [Block$_1(*,*,*)$], [Block$_2(*)$];

**Preassociative**

[$*$-{$*$}], [$*$/indexintro$(*,*,*,*)$], [$*$/intro$(*,*,*)$], [$*$/bothintro$(*,*,*,*,*)$], [$*$/nameintro$(*,*,*,*)$], [$*'$], [$*[\,*\,]$], [$*[*\rightarrow*]$], [$*[*\Rightarrow*]$], [$*0$], [$*1$], [0b], [$*$-color$(*)$], [$*$-color$^*(*)$], [$*^{\mathrm{H}}$], [$*^{\mathrm{T}}$], [$*^{\mathrm{U}}$], [$*^{\mathrm{h}}$], [$*^{\mathrm{t}}$], [$*^{\mathrm{s}}$], [$*^{\mathrm{c}}$], [$*^{\mathrm{d}}$], [$*^{\mathrm{a}}$], [$*^{\mathrm{C}}$], [$*^{\mathrm{M}}$], [$*^{\mathrm{B}}$], [$*^{\mathrm{r}}$], [$*^{\mathrm{i}}$], [$*^{\mathrm{d}}$], [$*^{\mathrm{R}}$], [$*^0$], [$*^1$], [$*^2$], [$*^3$], [$*^4$], [$*^5$], [$*^6$], [$*^7$], [$*^8$], [$*^9$], [$*^{\mathrm{E}}$], [$*^{\mathcal{V}}$], [$*^{\mathcal{C}}$], [$*^{\mathcal{C}^*}$], [$*^{\mathrm{hide}}$];

**Preassociative**

[“ $*$ ”], [], [$(*)^{\mathbf{t}}$], [string$(*)+*$], [string$(*)$ ++ $*$], [ $*$], [ $*$], [!$*$], [”$*$], [#$*$], [$$$*$], [%$*$], [&$*$], [’$*$], [($*$], [)$*$], [**$*$], [+$*$], [,$*$], [-$*$], [.$*$], [/$*$], [0$*$], [1$*$], [2$*$], [3$*$], [4$*$], [5$*$], [6$*$], [7$*$], [8$*$], [9$*$], [:$*$], [;$*$], [<$*$], [=$*$], [>$*$], [?$*$], [@$*$], [A$*$], [B$*$], [C$*$], [D$*$], [E$*$], [F$*$], [G$*$], [H$*$], [I$*$], [J$*$], [K$*$], [L$*$], [M$*$], [N$*$], [O$*$], [P$*$], [Q$*$], [R$*$], [S$*$], [T$*$], [U$*$], [V$*$], [W$*$], [X$*$], [Y$*$], [Z$*$], [[$*$], [\$*$], []$*$], [^$*$], [_$*$], [‘$*$], [a$*$], [b$*$], [c$*$], [d$*$], [e$*$], [f$*$], [g$*$], [h$*$], [i$*$], [j$*$], [k$*$], [l$*$], [m$*$], [n$*$], [o$*$], [p$*$], [q$*$], [r$*$], [s$*$], [t$*$], [u$*$], [v$*$], [w$*$], [x$*$], [y$*$], [z$*$], [{$*$], [|$*$], [}$*$], [~$*$], [**Preassociative** $*;*$], [**Postassociative** $*;*$], [[$*$], $*$], [priority $*$ end], [newline $*$], [macro newline $*$], [MacroIndent$(*)$];

**Preassociative**

[$*$ ’ $*$], [$*$ ‘ $*$];

**Preassociative**

[$*'$];

**Preassociative**

[$*\cdot*$], [$*\cdot_0*$];

**Preassociative**

$[* + *], [* +_0 *], [* +_1 *], [* - *], [* -_0 *], [* -_1 *];$
**Preassociative**
$[* \cup \{*\}], [* \cup *], [*\backslash\{*\}];$
**Postassociative**
$[* \therefore *], [* \underline{\therefore} *], [* \underline{::} *], [* \underline{+2*} *], [* :: *], [* +2* *];$
**Postassociative**
$[*, *];$
**Preassociative**
$[* \overset{\mathrm{B}}{\approx} *], [* \overset{\mathrm{D}}{\approx} *], [* \overset{\mathrm{C}}{\approx} *], [* \overset{\mathrm{P}}{\approx} *], [* \approx *], [* = *], [* \overset{+}{\to} *], [* \overset{\mathrm{t}}{=} *], [* \overset{\mathrm{t}^*}{=} *], [* \overset{\mathrm{r}}{=} *],$
$[* \in_{\mathrm{t}} *], [* \subseteq_{\mathrm{T}} *], [* \overset{\mathrm{T}}{=} *], [* \overset{\mathrm{s}}{=} *], [* \text{ free in } *], [* \text{ free in}^* *], [* \text{ free for } * \text{ in } *],$
$[* \text{ free for}^* * \text{ in } *], [* \in_{\mathrm{c}} *], [* < *], [* <' *], [* \leq' *], [* = *], [* \neq *], [*^{\mathrm{var}}],$
$[*\#^0*], [*\#^1*], [*\#^**];$
**Preassociative**
$[\neg *];$
**Preassociative**
$[* \wedge *], [* \ddot{\wedge} *], [* \tilde{\wedge} *], [* \wedge_{\mathrm{c}} *];$
**Preassociative**
$[* \vee *], [* \parallel *], [* \ddot{\vee} *];$
**Preassociative**
$[\exists *: *], [\forall *: *], [\forall_{\mathrm{obj}} *: *];$
**Postassociative**
$[* \ddot{\Rightarrow} *], [* \Rightarrow *], [* \Leftrightarrow *];$
**Postassociative**
$[* : *], [* \text{ spy } *], [*!*];$
**Preassociative**
$[* \begin{cases} * \\ * \end{cases} ];$
**Preassociative**
$[\lambda * .*], [\Lambda * .*], [\Lambda *], [\textbf{if } * \textbf{ then } * \textbf{ else } *], [\textbf{let } * = * \textbf{ in } *], [\textbf{let } * \ddot{=} * \text{ in } *];$
**Preassociative**
$[*\#*];$
**Preassociative**
$[*^{\mathrm{I}}], [*^{\triangleright}], [*^{\mathrm{V}}], [*^+], [*^-], [*^*];$
**Preassociative**
$[* @ *], [* \triangleright *], [* \Rrightarrow *], [* \gg *], [* \trianglerighteq *];$
**Postassociative**
$[* \vdash *], [* \Vdash *], [* \text{ i.e. } *];$
**Preassociative**
$[\forall *: *], [\Pi *: *];$
**Postassociative**
$[* \oplus *];$
**Postassociative**
$[*; *];$
**Preassociative**
$[* \text{ proves } *];$

**Preassociative**
[∗ **proof of** ∗ : ∗], [Line ∗ : ∗ ≫ ∗; ∗], [Last line ∗ ≫ ∗ □],
[Line ∗ : Premise ≫ ∗; ∗], [Line ∗ : Side-condition ≫ ∗; ∗], [Arbitrary ≫ ∗; ∗],
[Local ≫ ∗ = ∗; ∗], [Begin ∗; ∗ : End; ∗], [Last block line ∗ ≫ ∗ ; ],
[Arbitrary ≫ ∗; ∗];
**Postassociative**
[∗ | ∗];
**Postassociative**
[∗ then ∗], [∗[ ∗ ]∗];
**Preassociative**
[∗&∗], [→];
**Preassociative**
[∗\\∗], [∗\\∗]; ]