

The ILTP Library in Intuitionistic Linear Logic

October 14, 2018

Abstract

Here we present the results for the ILLTP-* and KLE-* benchmarks available at <https://github.com/meta-logic/lltp>.

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1 General Information

- Test run on a QEMU Virtual CPU, 2GHz, 64 bits, 6GB of RAM running Ubuntu.
- Timeout: 5min.
- Maude version: 2.7.1 built: Oct 2 2017.
- The search procedure considers proofs using up to 10 times the copy rule (focusing on one of the formulas of the classical context). Since this procedure is not complete, failures cannot be considered as non-provable sequents. For this reason, we reprocessed the problems that returned “failed” with a prover where the copy rule can be used an unboundedly number of times. The sequents marked as **fail** here can be then considered as non-theorems (since the prover explored all the possibilities).
- In some sequents the classical context appear as ‘T’ due to L^AT_EX constraints on the size of the figures.

$$\begin{array}{c}
\frac{}{a, c, !(a) \multimap !(b) : \cdot \vdash a} \quad \frac{}{a, b, c, !(a) \multimap !(b) : \cdot \vdash b} \\
\frac{}{a, c, !(a) \multimap !(b) : \cdot \vdash !(a)} ! \quad \frac{}{a, c, !(a) \multimap !(b) : !(b) \vdash b} \star \\
\hline
\frac{a, c, !(a) \multimap !(b) : !(a) \multimap !(b) \vdash b}{a, c, !(a) \multimap !(b) : \cdot \vdash b} D_C \quad \frac{}{a, c, !(a) \multimap !(b) : \cdot \vdash c} \star \\
\hline
\frac{a, c, !(a) \multimap !(b) : \cdot \vdash b \& c}{a, c, !(a) \multimap !(b) : \cdot \vdash !(b \& c)} ! \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(a) \& !(c)) \multimap !(b \& c)}{!(a) \multimap !(b) : \cdot \vdash !(!(!(a) \& !(c)) \multimap !(b \& c))} \star \\
\frac{}{\cdot : !(!(a) \multimap !(b)) \vdash !(!(!(a) \& !(c)) \multimap !(b \& c))} ! \star
\end{array}$$

file: KLE-01/KLE009+1.p (228 ms)

$$\begin{array}{c}
\frac{}{a, b, c, !(a) \multimap !(b) : \cdot \vdash c} \quad \frac{}{a, b, c, !(a) \multimap !(b) : \cdot \vdash b} \star \\
\hline
\frac{a, b, c, !(a) \multimap !(b) : \cdot \vdash c \& b}{a, b, c, !(a) \multimap !(b) : \cdot \vdash !(c \& b)} ! \\
\frac{}{a, c, !(a) \multimap !(b) : !(b) \vdash !(c \& b)} \star \\
\hline
\frac{a, c, !(a) \multimap !(b) : !(a) \multimap !(b) \vdash !(c \& b)}{a, c, !(a) \multimap !(b) : \cdot \vdash !(c \& b)} D_C \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(c) \& !(a)) \multimap !(c \& b)}{!(a) \multimap !(b) : \cdot \vdash !(!(!(c) \& !(a)) \multimap !(c \& b))} \star \\
\frac{}{\cdot : !(!(a) \multimap !(b)) \vdash !(!(!(c) \& !(a)) \multimap !(c \& b))} ! \star
\end{array}$$

file: KLE-01/KLE010+1.p (451 ms)

file: KLE-01/KLE011+1.p (301 ms)

$$\begin{array}{c}
\frac{}{c, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash c} \quad \frac{}{a, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash a} \quad \frac{}{a, b, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(b)} ! \\
\frac{}{c, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c)} ! \quad \frac{}{a, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(a)} ! \quad \frac{}{a, b, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c) \oplus !(b)} \oplus_1 \\
\hline
\frac{c, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c) \oplus !(b)}{c, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c) \oplus !(b)} \oplus_1 \quad \frac{a, !(c) \oplus !(a), !(a) \multimap !(b) : !(a) \multimap !(b) \vdash !(c) \oplus !(b)}{a, !(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c) \oplus !(b)} D_C \\
\hline
\frac{!(c) \oplus !(a), !(a) \multimap !(b) : !(c) \oplus !(a) \vdash !(c) \oplus !(b)}{!(c) \oplus !(a), !(a) \multimap !(b) : \cdot \vdash !(c) \oplus !(b)} D_C \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(c) \oplus !(a)) \multimap !(c) \oplus !(b)}{!(a) \multimap !(b) : \cdot \vdash !(!(!(c) \oplus !(a)) \multimap !(c) \oplus !(b))} \star \\
\frac{}{\cdot : !(!(a) \multimap !(b)) \vdash !(!(!(c) \oplus !(a)) \multimap !(c) \oplus !(b))} ! \star
\end{array}$$

$$\frac{\frac{\frac{a, !(a) \multimap !(0) : \cdot \vdash a}{a, !(a) \multimap !(0) : \cdot \vdash !(a)} ! \quad \frac{a, !(a) \multimap !(0) : \cdot \vdash !(0) \vdash b}{a, !(a) \multimap !(0) : \cdot \vdash b} \star}{\frac{a, !(a) \multimap !(0) : \cdot \vdash !(a) \multimap !(0) \vdash b}{a, !(a) \multimap !(0) : \cdot \vdash b} D_C} \multimap \quad \frac{\frac{!(a) \multimap !(0) : \cdot \vdash !(a) \multimap b}{!(a) \multimap !(0) : \cdot \vdash !(a) \multimap b} \star}{\frac{!(a) \multimap !(0) : \cdot \vdash !(a) \multimap b}{\therefore : !(a) \multimap !(0) \vdash !(a) \multimap b} !} \star$$

file: KLE-01/KLE014+1.p (37 ms)

$$\frac{\frac{\frac{a, b : \cdot \vdash b}{b : \cdot \vdash !(a) \multimap b}^*}{b : \cdot \vdash !(a) \multimap b}^!}{\cdot : !b \vdash !(a) \multimap b}^*$$

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file: KLE-01/KLE016+1.p (259 ms)
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[illegible]

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file: KLE-01/KLE018+1.p (430 ms)
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$$\begin{array}{c}
\frac{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{a}}{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (a)} ! \quad \frac{\overline{a}, b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{b}}{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : ! (b) \vdash b} * \\
\frac{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : ! (a) \multimap ! (b) \vdash b}{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{b}} D_C \quad \frac{b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{b}}{b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (b)} ! \quad \frac{\overline{a}, b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{a}}{b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : ! (a) \vdash a} * \\
\frac{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : ! (a) \multimap ! (b) \vdash b}{a, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{b}} D_C \quad \frac{b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : ! (b) \multimap ! (a) \vdash a}{b, ! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash \overline{a}} * \\
\frac{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (a) \multimap \overline{b}}{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (! (a) \multimap \overline{b})} * \quad \frac{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (b) \multimap \overline{a}}{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (! (b) \multimap \overline{a})} * \\
\frac{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (! (a) \multimap \overline{b}) \& ! (! (b) \multimap \overline{a})}{! (a) \multimap ! (b), ! (b) \multimap ! (a) : \vdash ! (! (! (a) \multimap \overline{b}) \& ! (! (b) \multimap \overline{a}))} ! \\
\vdash : ! (! (a) \multimap ! (b)), ! (! (b) \multimap ! (a)) \vdash ! (! (! (a) \multimap \overline{b}) \& ! (! (b) \multimap \overline{a})) *
\end{array}$$

5

$$\begin{array}{c}
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad ! \quad \frac{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \vdash b} \star \\
\hline
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \multimap !(b) \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} D_C \\
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a) \multimap b} \star \\
\frac{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a) \multimap b}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(!(a) \multimap b)} ! \\
\hline
\cdot : !(!(a) \multimap !(b)) \& !(!(b) \multimap !(a))) \vdash !(!(a) \multimap b) \star
\end{array}$$

file: KLE-01/KLE021+1.p (225 ms)

$$\begin{array}{c}
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad ! \quad \frac{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \vdash a} \star \\
\hline
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \multimap !(a) \vdash a}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} D_C \\
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b) \multimap a} \star \\
\frac{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b) \multimap a}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(!(b) \multimap a)} ! \\
\hline
\cdot : !(!(a) \multimap !(b)) \& !(!(b) \multimap !(a))) \vdash !(!(b) \multimap a) \star
\end{array}$$

file: KLE-01/KLE022+1.p (207 ms)

$$\begin{array}{c}
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad ! \quad \frac{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \vdash b} \star \\
\hline
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \multimap !(b) \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} D_C \\
\frac{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{\cdot : !(a), !(!(a) \multimap !(b)) \& !(!(b) \multimap !(a))) \vdash b} \star
\end{array}$$

file: KLE-01/KLE023+1.p (205 ms)

$$\begin{array}{c}
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad ! \quad \frac{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \vdash a} \star \\
\hline
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \multimap !(a) \vdash a}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} D_C \\
\frac{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a}{\cdot : !(b), !(!(a) \multimap !(b)) \& !(!(b) \multimap !(a))) \vdash a} \star
\end{array}$$

file: KLE-01/KLE024+1.p (46 ms)

file: KLE-01/KLE025+1.p (310 ms)

```
file: KLE-01/KLE026+1.p (612 ms)
```

```
file: KLE-01/KLE027+1.p (4199 ms)
```

```
file: KLE-01/KLE028+1.p (470 ms)
```

file: KLE-01/KLE029+1.p (687 ms)

file: KLE-01/KLE030+1.p (2903 ms)

file: KLE-01/KLE031+1.p (18722 ms)

[illegible][illegible][illegible][illegible]

[illegible]
$$\begin{array}{c}
\frac{a, b : \cdot \vdash b \quad a, b : \cdot \vdash a}{a, b : \cdot \vdash b \& a} \star \\
\frac{a, b : \cdot \vdash b \& a}{a, b : \cdot \vdash !(b \& a)} ! \\
\frac{\cdot : \cdot \vdash !(!(a) \& !(b)) \multimap !(b \& a)}{\cdot : \cdot \vdash !(!(!(a) \& !(b)) \multimap !(b \& a))} \star \\
\frac{\cdot : \cdot \vdash !(!(!(a) \& !(b)) \multimap !(b \& a))}{\cdot : \cdot \vdash !(!(!(a) \& !(b)) \multimap !(b \& a)) \& !(!(!(b) \& !(a)) \multimap !(a \& b))} ! \\
\frac{\cdot : \cdot \vdash !(!(!(a) \& !(b)) \multimap !(b \& a)) \& !(!(!(b) \& !(a)) \multimap !(a \& b))}{\cdot : \cdot \vdash !(!(!(a) \& !(b)) \multimap !(b \& a)) \& !(!(!(b) \& !(a)) \multimap !(a \& b))} \star
\end{array}
\quad
\begin{array}{c}
\frac{a, b : \cdot \vdash a \quad a, b : \cdot \vdash b}{a, b : \cdot \vdash a \& b} \star \\
\frac{a, b : \cdot \vdash a \& b}{a, b : \cdot \vdash !(a \& b)} ! \\
\frac{\cdot : \cdot \vdash !(!(b) \& !(a)) \multimap !(a \& b)}{\cdot : \cdot \vdash !(!(!(b) \& !(a)) \multimap !(a \& b))} \star \\
\frac{\cdot : \cdot \vdash !(!(!(b) \& !(a)) \multimap !(a \& b))}{\cdot : \cdot \vdash !(!(!(b) \& !(a)) \multimap !(a \& b)) \& !(!(!(a) \& !(b)) \multimap !(b \& a))} ! \\
\frac{\cdot : \cdot \vdash !(!(!(b) \& !(a)) \multimap !(a \& b)) \& !(!(!(a) \& !(b)) \multimap !(b \& a))}{\cdot : \cdot \vdash !(!(!(b) \& !(a)) \multimap !(a \& b)) \& !(!(!(a) \& !(b)) \multimap !(b \& a))} \star
\end{array}$$
$$\frac{\frac{\frac{a, !(a) \oplus !(b) : \cdot \vdash a}{a, !(a) \oplus !(b) : \cdot \vdash !(a)} !}{a, !(a) \oplus !(b) : \cdot \vdash !(b) \oplus !(a)} \oplus_1 \frac{\frac{\frac{b, !(a) \oplus !(b) : \cdot \vdash b}{b, !(a) \oplus !(b) : \cdot \vdash !(b)} !}{b, !(a) \oplus !(b) : \cdot \vdash !(b) \oplus !(a)} \oplus_1 \frac{\frac{\frac{b, !(b) \oplus !(a) : \cdot \vdash b}{b, !(b) \oplus !(a) : \cdot \vdash !(b)} !}{b, !(b) \oplus !(a) : \cdot \vdash !(a) \oplus !(b)} \oplus_1 \frac{\frac{\frac{a, !(b) \oplus !(a) : \cdot \vdash a}{a, !(b) \oplus !(a) : \cdot \vdash !(a)} !}{a, !(b) \oplus !(a) : \cdot \vdash !(a) \oplus !(b)} \oplus_1}{\frac{!(a) \oplus !(b) : !(a) \oplus !(b) \vdash !(b) \oplus !(a)}{!(a) \oplus !(b) : \cdot \vdash !(b) \oplus !(a)} D_C \star \frac{!(b) \oplus !(a) : !(b) \oplus !(a) \vdash !(a) \oplus !(b)}{!(b) \oplus !(a) : \cdot \vdash !(a) \oplus !(b)} D_C \star \frac{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a)}{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a)} ! \star \frac{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a)}{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a)} ! \star \frac{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a) \& !(!(b) \oplus !(a)) \multimap !(a) \oplus !(b)}{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a) \& !(!(b) \oplus !(a)) \multimap !(a) \oplus !(b)} ! \star \frac{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a) \& !(!(b) \oplus !(a)) \multimap !(a) \oplus !(b)}{\cdot : \cdot \vdash !(!(a) \oplus !(b)) \multimap !(b) \oplus !(a) \& !(!(b) \oplus !(a)) \multimap !(a) \oplus !(b)} ! \star$$
[illegible]

[illegible][illegible]
$$\begin{array}{c}
\frac{\overline{a, !(a) \oplus !(a) : \cdot \vdash a} \quad \overline{a, !(a) \oplus !(a) : \cdot \vdash a}}{\overline{!(a) \oplus !(a) : !(a) \oplus !(a) \vdash a}} \star \\
\frac{\overline{!(a) \oplus !(a) : \cdot \vdash a}}{\overline{!(a) \oplus !(a) : \cdot \vdash a}} D_C \\
\frac{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a}}{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a}} \star \\
\frac{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a}}{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a}} ! \\
\frac{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a} \quad \overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a}}{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a} \& !(a) \multimap !(a) \oplus !(a)} \\
\frac{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a} \& !(a) \multimap !(a) \oplus !(a)}}{\overline{\cdot : \cdot \vdash !(a) \oplus !(a)) \multimap a} \& !(a) \multimap !(a) \oplus !(a)}} !
\end{array}$$

$$\begin{array}{c}
\frac{\frac{a : \cdot \vdash a}{a : \cdot \vdash !(a)} !}{\frac{a : \cdot \vdash a \quad a : \cdot \vdash !(a) \oplus !(b)}{a : \cdot \vdash a \& !(a) \oplus !(b)} \oplus_1} \\
\frac{\frac{a : \cdot \vdash a \& !(a) \oplus !(b)}{a : \cdot \vdash !(a \& !(a) \oplus !(b))} !}{\frac{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))}{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))} \star} \\
\frac{\frac{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))}{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))} \star}{\frac{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))}{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))} !} \\
\frac{\frac{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))}{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))} !}{\cdot : \cdot \vdash !(a) \multimap !(a \& !(a) \oplus !(b))} \star
\end{array}$$

file: KLE-01/KLE048+1.p (104 ms)

$$\begin{array}{c}
\frac{\frac{a, !(a) \oplus !(a \& !(b)) : \cdot \vdash a \quad a, b, !(a) \oplus !(a \& !(b)) : \cdot \vdash a}{!(a) \oplus !(a \& !(b)) : !(a) \oplus !(a \& !(b)) \vdash a} \star}{\frac{!(a) \oplus !(a \& !(b)) : \cdot \vdash a}{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a} \star} D_C \\
\frac{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a}{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a} ! \\
\frac{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a}{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a} ! \\
\frac{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a}{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a} ! \\
\frac{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a}{\cdot : \cdot \vdash !(a) \oplus !(a \& !(b)) \multimap a} !
\end{array}$$

file: KLE-01/KLE049+1.p (133 ms)

$$\begin{array}{c}
\frac{\frac{a, !(a) \multimap !(b) : \cdot \vdash a}{a, !(a) \multimap !(b) : \cdot \vdash !(a)} !}{\frac{a, !(a) \multimap !(b) : \cdot \vdash !(a) \quad a, b, !(a) \multimap !(b) : \cdot \vdash b}{a, !(a) \multimap !(b) : !(b) \vdash b} \star} \multimap \\
\frac{\frac{a, !(a) \multimap !(b) : \cdot \vdash !(a) \quad a, b, !(a) \multimap !(b) : \cdot \vdash b}{a, !(a) \multimap !(b) : !(b) \vdash b} \star}{\frac{a, !(a) \multimap !(b) : \cdot \vdash b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} \star} D_C \\
\frac{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !} \\
\frac{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !} \\
\frac{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !} \\
\frac{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !} \\
\frac{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}{\frac{a : \cdot \vdash !(a) \multimap !(b) \multimap b}{a : \cdot \vdash !(a) \multimap !(b) \multimap b} !}
\end{array}$$

file: KLE-01/KLE050+1.p (94 ms)

[illegible]

file: KLE-01/KLE052+1.p (414 ms)

The diagram illustrates a sequence of mathematical expressions, likely representing a proof or a series of calculations. The expressions are arranged in a grid-like structure, with rows and columns. Each cell contains a mathematical expression, often involving variables like x , y , z , and w , and constants. The expressions are connected by arrows indicating a flow or relationship between them. The diagram is titled "file: KLE-01/KLE052+1.p (414 ms)".


```
file: KLE-01/KLE057+1.p (83 ms)
```

```
file: KLE-01/KLE058+1.p (480 ms)
```

```
file: KLE-01/KLE060+1.p (443 ms)
```

```
file: KLE-01/KLE061+1.p (72 ms)
```

The diagram illustrates a sequence of nested, overlapping rectangular regions, labeled R_1, R_2, R_3, \dots . The regions are arranged in a descending staircase pattern from top-left to bottom-right. Each region is defined by a set of indices or parameters, often involving mathematical symbols like σ , τ , and λ . The regions are nested, meaning that R_i contains R_{i+1} . The diagram shows the relationship between these regions and their defining parameters, with some regions being further subdivided or defined by specific sets of indices.

$$\frac{\frac{a, !(b) \oplus !(b) \multimap !(0)) : \cdot \vdash a}{\cdot : \cdot \vdash !(a) \& !(b) \oplus !(b) \multimap !(0))} \star}{\cdot : \cdot \vdash !(a) \& !(b) \oplus !(b) \multimap !(0))} !$$
[illegible]
$$\frac{\frac{\frac{a, b, !(b) \multimap !(0) : \cdot \vdash \bar{b}}{a, b, !(b) \multimap !(0) : \cdot \vdash !(b)} ! \quad \frac{a, b, !(b) \multimap !(0) : !(0) \vdash !(b \& !(!(b) \multimap (0)))}{\frac{a, b, !(b) \multimap !(0) : !(b) \multimap !(0) \vdash !(b \& !(!(b) \multimap (0)))}{a, b, !(b) \multimap !(0) : \cdot \vdash !(b \& !(!(b) \multimap (0)))} D_C} \star}{\frac{\cdot : \cdot \vdash !(!(a) \& !(!(b) \& !(!(b) \multimap (0)))) \multimap !(b \& !(!(b) \multimap (0)))}{\cdot : \cdot \vdash !(!(!(a) \& !(!(b) \& !(!(b) \multimap (0)))) \multimap !(b \& !(!(b) \multimap (0))))} !} \star$$

```
file: KLE-01/KLE069+1.p (timeout!)
```



file: KLE-01/KLE071+1.p (288 ms)



file: KLE-01/KLE072+1.p (319 ms)



file: KLE-01/KLE073+1.p (297 ms)



file: KLE-01/KLE074+1.p (timeout!)

file: KLE-01/KLE075+1.p (timeout!)

file: KLE-01/KLE076+1.p (395 ms)



file: KLE-01/KLE077+1.p (284 ms)



file: KLE-01/KLE078+1.p (timeout!)

file: KLE-01/KLE079+1.p (360 ms)



file: KLE-01/KLE080+1.p (109 ms)

$$\begin{array}{c}
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash b}{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash !b} ! \\
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash !b}{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : !b \rightarrow !(\mathbf{0}) \vdash \mathbf{0}} D_C \\
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : !b \rightarrow !(\mathbf{0}) \vdash \mathbf{0}}{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash \mathbf{0}} \star \\
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash \mathbf{0}}{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : !b \rightarrow !(\mathbf{0}) \vdash \mathbf{0}} \star \\
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : !b \rightarrow !(\mathbf{0}) \vdash \mathbf{0}}{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash \mathbf{0}} D_C \\
 \frac{a, b, !(a \rightarrow !(b \rightarrow !(\mathbf{0})), !(b \rightarrow !(\mathbf{0})) : \cdot \vdash \mathbf{0}}{a, b : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}} \star \\
 \frac{a, b : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}}{a, b : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}} ! \\
 \frac{a, b : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}}{\cdot : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}} \star \\
 \frac{\cdot : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}}{\cdot : \cdot \vdash !(a \rightarrow !(b \rightarrow !(\mathbf{0}))) \rightarrow \mathbf{0}} !
 \end{array}$$

file: KLE-01/KLE081+1.p (294 ms)

$$\begin{array}{c}
\frac{a, ! (a \multimap ! (0)) : \cdot \vdash a}{a, ! (a \multimap ! (0)) : \cdot \vdash ! (a)} ! \quad \frac{a, ! (a \multimap ! (0)) : ! (0) \vdash 0}{a, ! (a \multimap ! (0)) : ! (a) \multimap ! (0) \vdash 0} \star \\
\frac{a, ! (a \multimap ! (0)) : ! (a) \multimap ! (0) \vdash 0}{a, ! (a \multimap ! (0)) : \cdot \vdash 0} D_C \\
\frac{a : \cdot \vdash ! (! (a) \multimap ! (0)) \multimap 0}{a : \cdot \vdash ! (! (! (a) \multimap ! (0)) \multimap 0)} \star \\
\frac{a : \cdot \vdash ! (! (! (a) \multimap ! (0)) \multimap 0)}{\cdot : ! (a) \vdash ! (! (! (a) \multimap ! (0)) \multimap 0)} \star
\end{array}$$

file: ILLTP-01/SYJ/SYJ103+1.p (timeout!)

file: ILLTP-01/SYJ/SYJ104+1.p (210 ms)

$$\begin{array}{c}
\frac{a, ! (a \multimap ! (b)) : \cdot \vdash a}{a, ! (a \multimap ! (b)) : \cdot \vdash ! (a)} ! \quad \frac{a, b, ! (a \multimap ! (b)) : \cdot \vdash b}{a, ! (a \multimap ! (b)) : ! (b) \vdash b} \star \\
\frac{a, ! (a \multimap ! (b)) : ! (a) \multimap ! (b) \vdash b}{a, ! (a \multimap ! (b)) : \cdot \vdash b} D_C \\
\frac{! (a) \multimap ! (b) : \cdot \vdash ! (a) \multimap b}{! (a) \multimap ! (b) : \cdot \vdash ! (! (a) \multimap b)} \star \\
\frac{! (a) \multimap ! (b) : \cdot \vdash ! (! (a) \multimap b)}{\cdot : ! (! (a) \multimap ! (b)) \vdash ! (! (a) \multimap b)} \star
\end{array}$$

file: ILLTP-01/SYJ/SYJ105+1.002.p (331 ms)

file: ILLTP-01/SYJ/SYJ105+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ105+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ106+1.p (1776 ms)

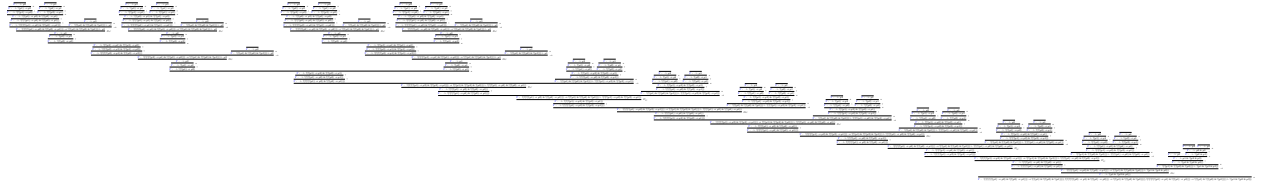
file: ILLTP-01/SYJ/SYJ107+1.001.p (777 ms)

file: ILLTP-01/SYJ/SYJ107+1.002.p (113788 ms)

file: ILLTP-01/SYJ/SYJ107+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ107+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.001.p (59069 ms)



file: ILLTP-01/SYJ/SYJ201+1.002.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ201+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.001.p (38 ms)

$$\begin{array}{c}
 \frac{o11, o21 : \cdot \vdash o11}{o11, o21 : \cdot \vdash !(o11)} ! \\
 \frac{o11, o21 : \cdot \vdash !(o11)}{o11, o21 : \cdot \vdash !(o11) \oplus !(o21)} \oplus_1 \\
 \therefore !(o11), !(o21) \vdash !(o11) \oplus !(o21) \star
 \end{array}$$

file: ILLTP-01/SYJ/SYJ202+1.002.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.016.p (timeout!)

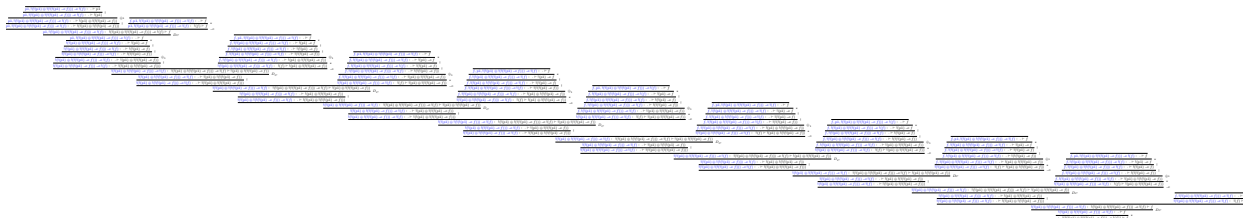
file: ILLTP-01/SYJ/SYJ202+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ202+1.020.p (timeout!)

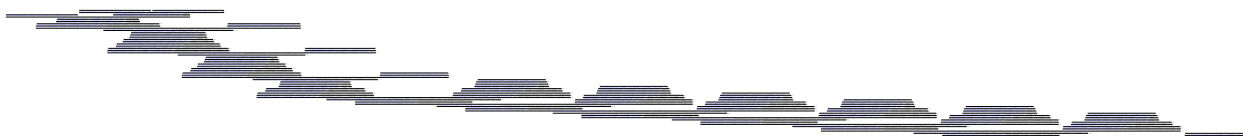
file: ILLTP-01/SYJ/SYJ203+1.001.p (708 ms)



file: ILLTP-01/SYJ/SYJ203+1.002.p (4141 ms)



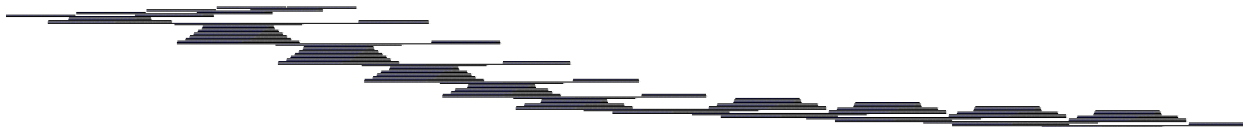
file: ILLTP-01/SYJ/SYJ203+1.003.p (4196 ms)



file: ILLTP-01/SYJ/SYJ203+1.004.p (5121 ms)



file: ILLTP-01/SYJ/SYJ203+1.005.p (7110 ms)



file: ILLTP-01/SYJ/SYJ203+1.006.p (11445 ms)

file: ILLTP-01/SYJ/SYJ203+1.007.p (21914 ms)

file: ILLTP-01/SYJ/SYJ203+1.008.p (46238 ms)

file: ILLTP-01/SYJ/SYJ203+1.009.p (97294 ms)

```
file: ILLTP-01/SYJ/SYJ203+1.010.p (timeout!)
```

```
file: ILLTP-01/SYJ/SYJ203+1.011.p (timeout!)
```

```
file: ILLTP-01/SYJ/SYJ203+1.012.p (timeout!)
```

```
file: ILLTP-01/SYJ/SYJ203+1.013.p (timeout!)
```

```
file: ILLTP-01/SYJ/SYJ203+1.014.p (timeout!)
```

```
file: ILLTP-01/SYJ/SYJ203+1.015.p (timeout!)
```

file: ILLTP-01/SYJ/SYJ203+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ203+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ203+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ203+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ203+1.020.p (timeout!)

$$\frac{\frac{\frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \overline{p1}}{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1)} \quad ! \quad \frac{\frac{p0,p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \overline{p0}}{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p0) \vdash p0} \quad +}{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1)}{p1,!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1)} \quad ! \quad \frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0}{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p0)} \quad D_C}{\frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1)}{p1,!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1)} \quad ! \quad \frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0}{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p0)} \quad D_C}{\frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0}{p1,!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0} \quad D_C}{\frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0}{\vdash : !(p1),!(!(p1) \multimap !(p1) \multimap !(p0)) \vdash p0} \quad \star}{\frac{\frac{p1,!(p1) \multimap !(p0),!(p1) \multimap !(!(p1) \multimap !(p0)) : \vdash \dagger(p1) \multimap !(p1) \multimap !(p0) \vdash p0}{\vdash : !(p1),!(!(p1) \multimap !(p1) \multimap !(p0)) \vdash p0} \quad \star} \quad \multimap$$

file: ILLTP-01/SYJ/SYJ204+1.002.p (512 ms)

```
file: ILLTP-01/SYJ/SYJ204+1.003.p (1919 ms)
```

```
file: ILLTP-01/SYJ/SYJ204+1.004.p (9018 ms)
```

```
file: ILLTP-01/SYJ/SYJ204+1.005.p (34407 ms)
```

[illegible]

file: ILLTP-01/SYJ/SYJ204+1.006.p (145814 ms)

file: ILLTP-01/SYJ/SYJ204+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ204+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.001.p (31385 ms)

file: ILLTP-01/SYJ/SYJ205+1.002.p (93005 ms)

file: ILLTP-01/SYJ/SYJ205+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ205+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.001.p (46 ms)

$$\frac{\frac{a1 : \cdot \vdash a1}{\cdot : \cdot \vdash !(a1) \multimap a1} \star \quad \frac{a1 : \cdot \vdash a1}{\cdot : \cdot \vdash !(a1) \multimap a1} \star}{\cdot : \cdot \vdash !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1} !$$

file: ILLTP-01/SYJ/SYJ206+1.002.p (494 ms)

$$\frac{\frac{a1 : \cdot \vdash a1}{\cdot : \cdot \vdash !(a1) \multimap a1} \star \quad \frac{a1 : \cdot \vdash a1}{\cdot : \cdot \vdash !(a1) \multimap a1} \star}{\cdot : \cdot \vdash !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1} ! \quad \frac{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1}{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1} !$$

file: ILLTP-01/SYJ/SYJ206+1.003.p (58237 ms)

file: ILLTP-01/SYJ/SYJ206+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ206+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ207+1.001.p (timeout!)

file: ILLTP-01/SYJ/SYJ207+1.002.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.003.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.004.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.005.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.006.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.007.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.008.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.009.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.010.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.011.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.012.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.013.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.014.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.015.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.016.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.017.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.018.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.019.p (timeout!)
file: ILLTP-01/SYJ/SYJ207+1.020.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.001.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.002.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.003.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.004.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.005.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.006.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.007.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.008.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.009.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.010.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.011.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.012.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.013.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.014.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.015.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.016.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ208+1.018.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.019.p (timeout!)
file: ILLTP-01/SYJ/SYJ208+1.020.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.001.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.002.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.003.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.004.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.005.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.006.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.007.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.008.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.009.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.010.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.011.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.012.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.013.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.014.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.015.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.016.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.017.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.018.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.019.p (timeout!)
file: ILLTP-01/SYJ/SYJ209+1.020.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.001.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.002.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.003.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.004.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.005.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.006.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.007.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.008.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.009.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.010.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.011.p (timeout!)
file: ILLTP-01/SYJ/SYJ210+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ210+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.001.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.002.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.017.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ211+1.020.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.001.p (1303 ms)

file: ILLTP-01/SYJ/SYJ212+1.002.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.003.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.004.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.005.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.006.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.007.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.008.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.009.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.010.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.011.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.012.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.013.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.014.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.015.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.016.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.017.p (timeout!)

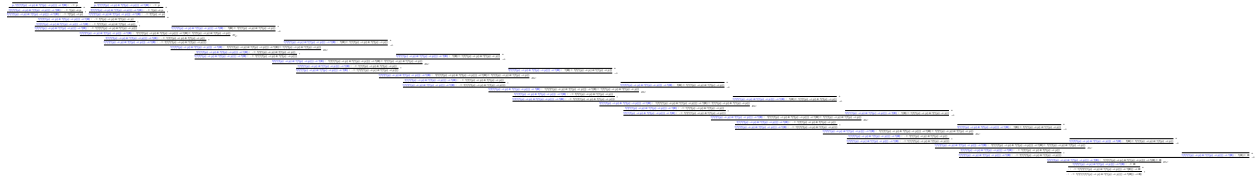
file: ILLTP-01/SYJ/SYJ212+1.018.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.019.p (timeout!)

file: ILLTP-01/SYJ/SYJ212+1.020.p (timeout!)

2.4 SYN Problems

file: ILLTP-01/SYN/SYN001+1.p (316 ms)



file: ILLTP-01/SYN/SYN007+1.014.p (timeout!)

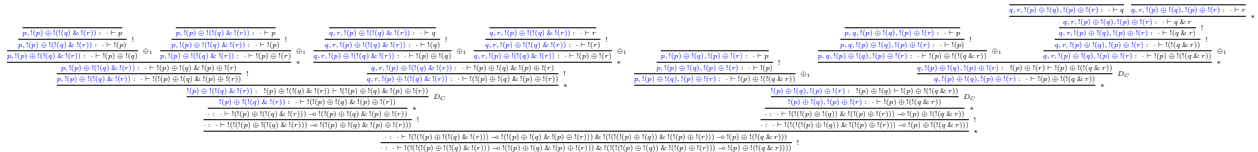
file: ILLTP-01/SYN/SYN040+1.p (timeout!)

file: ILLTP-01/SYN/SYN041+1.p (timeout!)

file: ILLTP-01/SYN/SYN044+1.p (633 ms)



file: ILLTP-01/SYN/SYN045+1.p (812 ms)



file: ILLTP-01/SYN/SYN046+1.p (timeout!)

file: ILLTP-01/SYN/SYN047+1.p (timeout!)

file: ILLTP-01/SYN/SYN387+1.p (timeout!)

file: ILLTP-01/SYN/SYN388+1.p (timeout!)

file: ILLTP-01/SYN/SYN389+1.p (timeout!)

file: ILLTP-01/SYN/SYN390+1.p (55 ms)

$$\frac{\frac{\frac{p : \cdot \vdash p}{\cdot : \cdot \vdash !(p) \multimap p} \star}{\cdot : \cdot \vdash !(p) \multimap p} !}{\frac{\frac{\frac{p : \cdot \vdash p}{\cdot : \cdot \vdash !(p) \multimap p} \star}{\cdot : \cdot \vdash !(p) \multimap p} !}{\cdot : \cdot \vdash !(p) \multimap p \& !(p) \multimap p} \star}{\cdot : \cdot \vdash !(p) \multimap p \& !(p) \multimap p} !}$$

file: ILLTP-01/SYN/SYN391+1.p (388 ms)

file: ILLTP-01/SYN/SYN392+1.p (timeout!)

file: ILLTP-01/SYN/SYN393+1.p (timeout!)

file: ILLTP-01/SYN/SYN416+1.p (timeout!)

file: ILLTP-01/SYN/SYN915+1.p (17 ms)

$\cdot : \cdot \vdash 1$

file: ILLTP-01/SYN/SYN916+1.p (timeout!)

file: ILLTP-01/SYN/SYN977+1.p (timeout!)

file: ILLTP-01/SYN/SYN978+1.p (89 ms)

$$\frac{\frac{\frac{a, b : \cdot \vdash b}{a, b : \cdot \vdash !(a) \multimap b} \star}{a, b : \cdot \vdash !(a) \multimap b} !}{\frac{\frac{\frac{a, b : \cdot \vdash b}{a, b : \cdot \vdash !(b) \multimap a} \star}{a, b : \cdot \vdash !(b) \multimap a} !}{a, b : \cdot \vdash !(a) \multimap b \& !(b) \multimap a} \star}{\frac{\frac{\frac{a, b : \cdot \vdash b}{a, b : \cdot \vdash !(a) \multimap b} \star}{a, b : \cdot \vdash !(a) \multimap b} !}{a, b : \cdot \vdash !(a) \multimap b \& !(b) \multimap a} \star}{\cdot : \cdot \vdash !(a) \& !(b) \multimap !(a) \multimap b \& !(b) \multimap a} \star}{\cdot : \cdot \vdash !(a) \& !(b) \multimap !(a) \multimap b \& !(b) \multimap a} !}$$

3 Translation Call-by-Name

3.1 KLE Problems

file: KLE-cbn/KLE001+1.p (26 ms)

$$\frac{\frac{a : \cdot \vdash a}{\cdot : \cdot \vdash !(a) \multimap a} \star}{\cdot : \cdot \vdash !(a) \multimap a} \star$$

file: KLE-cbn/KLE002+1.p (227 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash a} \\
\frac{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash !(a) \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap c : b \vdash b}}{} \multimap \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : !(a) \multimap b \vdash b} D_C \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash b} \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash !(b)} ! \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : c \vdash c} \multimap \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : !(b) \multimap c \vdash c} D_C \\
\frac{}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash c} \\
\frac{}{\cdot : !(a) \multimap b, !(b) \multimap c \vdash !(a) \multimap c} \star
\end{array}$$

file: KLE-cbn/KLE003+1.p (71 ms)

$$\begin{array}{c}
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash a} \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash !(a)} ! \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash b} \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash !(b)} ! \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : c \vdash c} \multimap \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : !(b) \multimap c \vdash c} \multimap \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : !(a) \multimap !(b) \multimap c \vdash c} D_C \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash c} \\
\frac{}{\cdot : !(a) \multimap !(b) \multimap c \vdash !(b) \multimap !(a) \multimap c} \star
\end{array}$$

file: KLE-cbn/KLE004+1.p (71 ms)

$$\begin{array}{c}
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash a} \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash !(a)} ! \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash b} \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash !(b)} ! \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : c \vdash c} \multimap \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : !(b) \multimap c \vdash c} \multimap \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : !(a) \multimap !(b) \multimap c \vdash c} D_C \\
\frac{}{a, b, !(a) \multimap !(b) \multimap c : \cdot \vdash c} \\
\frac{}{\cdot : !(a) \multimap !(b) \multimap c \vdash !(a \& b) \multimap c} \star
\end{array}$$

file: KLE-cbn/KLE005+1.p (79 ms)

$$\begin{array}{c}
\frac{}{a, b, !(a \& b) \multimap c : \cdot \vdash a} \\
\frac{}{a, b, !(a \& b) \multimap c : \cdot \vdash b} \\
\frac{}{a, b, !(a \& b) \multimap c : \cdot \vdash a \& b} \star \\
\frac{}{a, b, !(a \& b) \multimap c : \cdot \vdash !(a \& b)} ! \\
\frac{}{a, b, !(a \& b) \multimap c : c \vdash c} \multimap \\
\frac{}{a, b, !(a \& b) \multimap c : !(a \& b) \multimap c \vdash c} D_C \\
\frac{}{a, b, !(a \& b) \multimap c : \cdot \vdash c} \\
\frac{}{\cdot : !(a \& b) \multimap c \vdash !(a) \multimap !(b) \multimap c} \star
\end{array}$$

file: KLE-cbn/KLE006+1.p (221 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash a} \\
\frac{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash !(a) \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap c : b \vdash b}}{\frac{a, !(a) \multimap b, !(b) \multimap c : !(a) \multimap b \vdash b}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash b} D_C} \multimap \\
\frac{\frac{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash b}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash !(b)} ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap c : c \vdash c}}{\frac{a, !(a) \multimap b, !(b) \multimap c : !(b) \multimap c \vdash c}{a, !(a) \multimap b, !(b) \multimap c : \cdot \vdash c} D_C} \multimap \\
\frac{\cdot : !(a) \multimap b \vdash !(b) \multimap c \multimap !(a) \multimap c}{\cdot : !(a) \multimap b \vdash !(b) \multimap c \multimap !(a) \multimap c} \star
\end{array}$$

file: KLE-cbn/KLE007+1.p (222 ms)

$$\begin{array}{c}
\frac{}{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash c} \\
\frac{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash !(c) \quad ! \quad \frac{}{c, !(a) \multimap b, !(c) \multimap a : a \vdash a}}{\frac{c, !(a) \multimap b, !(c) \multimap a : !(c) \multimap a \vdash a}{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash a} D_C} \multimap \\
\frac{\frac{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash a}{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash !(a)} ! \quad \frac{}{c, !(a) \multimap b, !(c) \multimap a : b \vdash b}}{\frac{c, !(a) \multimap b, !(c) \multimap a : !(a) \multimap b \vdash b}{c, !(a) \multimap b, !(c) \multimap a : \cdot \vdash b} D_C} \multimap \\
\frac{\cdot : !(a) \multimap b \vdash !(c) \multimap a \multimap !(c) \multimap b}{\cdot : !(a) \multimap b \vdash !(c) \multimap a \multimap !(c) \multimap b} \star
\end{array}$$

file: KLE-cbn/KLE008+1.p (73 ms)

$$\begin{array}{c}
\frac{}{a, c, !(a) \multimap b : \cdot \vdash a} \\
\frac{a, c, !(a) \multimap b : \cdot \vdash !(a) \quad ! \quad \frac{}{a, c, !(a) \multimap b : b \vdash b}}{\frac{a, c, !(a) \multimap b : !(a) \multimap b \vdash b}{a, c, !(a) \multimap b : \cdot \vdash b} D_C} \multimap \\
\frac{\frac{a, c, !(a) \multimap b : \cdot \vdash b}{a, c, !(a) \multimap b : \cdot \vdash c} \quad \frac{}{a, c, !(a) \multimap b : \cdot \vdash c}}{\cdot : !(a) \multimap b \vdash (a \& c) \multimap b \& c} \star
\end{array}$$

file: KLE-cbn/KLE009+1.p (62 ms)

$$\begin{array}{c}
\frac{}{a, c, !(a) \multimap b : \cdot \vdash a} \\
\frac{a, c, !(a) \multimap b : \cdot \vdash !(a) \quad ! \quad \frac{}{a, c, !(a) \multimap b : b \vdash b}}{\frac{a, c, !(a) \multimap b : !(a) \multimap b \vdash b}{a, c, !(a) \multimap b : \cdot \vdash b} D_C} \multimap \\
\frac{a, c, !(a) \multimap b : \cdot \vdash c \quad \frac{a, c, !(a) \multimap b : \cdot \vdash b}{\cdot : !(a) \multimap b \vdash (c \& a) \multimap c \& b} \star
\end{array}$$

file: KLE-cbn/KLE010+1.p (463 ms)

file: KLE-cbn/KLE017+1.p (timeout!)

file: KLE-cbn/KLE018+1.p (402 ms)

[The following text is a dense, multi-line sequence of logical expressions and symbols, likely representing a complex proof or derivation. It includes various logical connectives like \rightarrow , \neg , \wedge , \vee , and quantifiers like \forall , \exists . The text is partially obscured by a large, faint watermark that reads "KLE-cbn/KLE019+1.p (255 ms)".]

file: KLE-cbn/KLE019+1.p (255 ms)

$$\frac{\frac{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash a}{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash !(a)} ! \quad \frac{a, !(a) \rightarrow b, !(b) \rightarrow a : b \vdash b}{a, !(a) \rightarrow b, !(b) \rightarrow a : !(a) \rightarrow b \vdash b} D_C}{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash b} D_C \quad \frac{\frac{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash b}{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash !(b)} ! \quad \frac{b, !(a) \rightarrow b, !(b) \rightarrow a : a \vdash a}{b, !(a) \rightarrow b, !(b) \rightarrow a : !(b) \rightarrow a \vdash a} D_C}{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash a} D_C \quad \star$$

$$\therefore !(a) \rightarrow b, !(b) \rightarrow a \vdash !(a) \rightarrow b \& !(b) \rightarrow a$$

file: KLE-cbn/KLE020+1.p (216 ms)

$$\frac{\frac{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash a}{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash !(a)} ! \quad \frac{a, !(a) \rightarrow b, !(b) \rightarrow a : b \vdash b}{a, !(a) \rightarrow b, !(b) \rightarrow a : !(a) \rightarrow b \vdash b} D_C}{a, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash b} D_C \quad \star$$

$$\therefore !(a) \rightarrow b \& !(b) \rightarrow a \vdash !(a) \rightarrow b$$

file: KLE-cbn/KLE021+1.p (200 ms)

$$\frac{\frac{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash b}{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash !(b)} ! \quad \frac{b, !(a) \rightarrow b, !(b) \rightarrow a : a \vdash a}{b, !(a) \rightarrow b, !(b) \rightarrow a : !(b) \rightarrow a \vdash a} D_C}{b, !(a) \rightarrow b, !(b) \rightarrow a : \cdot \vdash a} D_C \quad \star$$

$$\therefore !(a) \rightarrow b \& !(b) \rightarrow a \vdash !(b) \rightarrow a$$

file: KLE-cbn/KLE022+1.p (199 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \\
\frac{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash !(a)}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash b} \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : b \vdash b} \\
\hline
\frac{a, !(a) \multimap b, !(b) \multimap a : !(a) \multimap b \vdash b}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash b} \quad D_C \\
\hline
\cdot : !(a), !(!(a) \multimap b \& !(b) \multimap a) \vdash b \quad \star
\end{array}$$

file: KLE-cbn/KLE023+1.p (204 ms)

$$\begin{array}{c}
\frac{}{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash b} \\
\frac{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash !(b)}{b, !(a) \multimap b, !(b) \multimap a : a \vdash a} \quad ! \quad \frac{}{b, !(a) \multimap b, !(b) \multimap a : a \vdash a} \\
\hline
\frac{b, !(a) \multimap b, !(b) \multimap a : !(b) \multimap a \vdash a}{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \quad D_C \\
\hline
\cdot : !(b), !(!(a) \multimap b \& !(b) \multimap a) \vdash a \quad \star
\end{array}$$

file: KLE-cbn/KLE024+1.p (27 ms)

$$\frac{\frac{}{a : \cdot \vdash a} \quad \frac{}{a : \cdot \vdash a}}{\cdot : \cdot \vdash !(a) \multimap a \& !(a) \multimap a} \quad \star$$

file: KLE-cbn/KLE025+1.p (255 ms)

$$\begin{array}{c}
\frac{}{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash b} \\
\frac{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash !(b)}{b, !(a) \multimap b, !(b) \multimap a : a \vdash a} \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \\
\frac{b, !(a) \multimap b, !(b) \multimap a : !(b) \multimap a \vdash a}{b, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \quad D_C \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : b \vdash b} \\
\frac{a, !(a) \multimap b, !(b) \multimap a : !(a) \multimap b \vdash b}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash b} \quad D_C \\
\hline
\cdot : !(!(a) \multimap b \& !(b) \multimap a) \vdash !(b) \multimap a \& !(a) \multimap b \quad \star
\end{array}$$

file: KLE-cbn/KLE026+1.p (492 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \\
\frac{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash !(a)}{a, !(a) \multimap b, !(b) \multimap a : a \vdash a} \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : a \vdash a} \\
\hline
\frac{a, !(a) \multimap b, !(b) \multimap a : !(a) \multimap a \vdash a}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \quad D_C \\
\hline
\cdot : !(a), !(!(a) \multimap b \& !(b) \multimap a) \vdash a \quad \star
\end{array}$$

file: KLE-cbn/KLE027+1.p (637 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \\
\frac{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash !(a)}{a, !(a) \multimap b, !(b) \multimap a : a \vdash a} \quad ! \quad \frac{}{a, !(a) \multimap b, !(b) \multimap a : a \vdash a} \\
\hline
\frac{a, !(a) \multimap b, !(b) \multimap a : !(a) \multimap a \vdash a}{a, !(a) \multimap b, !(b) \multimap a : \cdot \vdash a} \quad D_C \\
\hline
\cdot : !(a), !(!(a) \multimap b \& !(b) \multimap a) \vdash a \quad \star
\end{array}$$

file: KLE-cbn/KLE028+1.p (491 ms)

file: KLE-cbn/KLE029+1.p (921 ms)

file: KLE-cbn/KLE030+1.p (27712 ms)

file: KLE-cbn/KLE031+1.p (237319 ms)

file: KLE-cbn/KLE032+1.p (303 ms)

$$\begin{array}{c}
 \frac{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash b}{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash !b} \quad \frac{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : a \vdash a}{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : !b \rightarrow a \vdash a} \quad D_C \\
 \frac{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash a}{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash !a} \quad D_C \\
 \frac{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash !a}{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash c} \quad D_C \\
 \frac{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash c}{b, !a \rightarrow b, !a \rightarrow c, !b \rightarrow a : \vdash c} \quad D_C \\
 \vdots \quad !(!a \rightarrow b \& !b \rightarrow a) \vdash !(!a \rightarrow c) \rightarrow !b \rightarrow c \& !(!b \rightarrow c) \rightarrow !a \rightarrow c
 \end{array}$$

file: KLE-cbn/KLE033+1.p (643 ms)

file: KLE-cbn/KLE034+1.p (258 ms)

$$\begin{array}{c}
 \frac{a, c, !a \rightarrow b, !b \rightarrow a : \vdash a}{a, c, !a \rightarrow b, !b \rightarrow a : \vdash !a} \quad \frac{a, c, !a \rightarrow b, !b \rightarrow a : b \vdash b}{a, c, !a \rightarrow b, !b \rightarrow a : !a \rightarrow b \vdash b} \quad D_C \\
 \frac{a, c, !a \rightarrow b, !b \rightarrow a : \vdash a}{a, c, !a \rightarrow b, !b \rightarrow a : \vdash b} \quad D_C \\
 \vdots \quad !(!a \rightarrow b \& !b \rightarrow a) \vdash !a \& c \rightarrow !a \& c \& !b \rightarrow c \& !b \rightarrow c \& !b \rightarrow c \& !b \rightarrow c
 \end{array}$$

file: KLE-cbn/KLE035+1.p (257 ms)

$$\begin{array}{c}
 \frac{a, c, !a \rightarrow b, !b \rightarrow a : \vdash a}{a, c, !a \rightarrow b, !b \rightarrow a : \vdash !a} \quad \frac{a, c, !a \rightarrow b, !b \rightarrow a : b \vdash b}{a, c, !a \rightarrow b, !b \rightarrow a : !a \rightarrow b \vdash b} \quad D_C \\
 \frac{a, c, !a \rightarrow b, !b \rightarrow a : \vdash a}{a, c, !a \rightarrow b, !b \rightarrow a : \vdash b} \quad D_C \\
 \vdots \quad !(!a \rightarrow b \& !b \rightarrow a) \vdash !c \& a \rightarrow !c \& b \& !c \& b \rightarrow c \& a
 \end{array}$$

file: KLE-cbn/KLE036+1.p (7420 ms)

file: KLE-cbn/KLE037+1.p (5515 ms)

file: KLE-cbn/KLE046+1.p (66 ms)

$$\frac{\frac{\overline{a, !(a) \oplus !(a) : \cdot \vdash a} \quad \overline{a, !(a) \oplus !(a) : \cdot \vdash a}}{!(a) \oplus !(a) : !(a) \oplus !(a) \vdash a} \star \quad \frac{\overline{a : \cdot \vdash a}}{a : \cdot \vdash !(a)} !}{\frac{!(a) \oplus !(a) : \cdot \vdash a}{a : \cdot \vdash !(a) \oplus !(a)} \oplus_1} D_C \star$$

$$\cdot : \cdot \vdash !(!(a) \oplus !(a)) \multimap a \& !(a) \multimap !(a) \oplus !(a)$$

file: KLE-cbn/KLE047+1.p (44 ms)

$$\frac{\frac{\overline{a, !(a) \oplus !(b) : \cdot \vdash a} \quad \overline{a : \cdot \vdash a} \quad \overline{a : \cdot \vdash !(a) \oplus !(b)}}{\cdot : \cdot \vdash !(a \& !(a) \oplus !(b)) \multimap a \& !(a) \multimap a \& !(a) \oplus !(b)} \oplus_1 \star$$

file: KLE-cbn/KLE048+1.p (73 ms)

$$\frac{\frac{\overline{a, !(a) \oplus !(a \& b) : \cdot \vdash a} \quad \overline{a, b, !(a) \oplus !(a \& b) : \cdot \vdash a}}{!(a) \oplus !(a \& b) : !(a) \oplus !(a \& b) \vdash a} \star \quad \frac{\overline{a : \cdot \vdash a}}{a : \cdot \vdash !(a)} !}{\frac{!(a) \oplus !(a \& b) : \cdot \vdash a}{a : \cdot \vdash !(a) \oplus !(a \& b)} \oplus_1} D_C \star$$

$$\cdot : \cdot \vdash !(!(a) \oplus !(a \& b)) \multimap a \& !(a) \multimap !(a) \oplus !(a \& b)$$

file: KLE-cbn/KLE049+1.p (72 ms)

$$\frac{\overline{a, !(a) \multimap b : \cdot \vdash a}}{a, !(a) \multimap b : \cdot \vdash !(a)} ! \quad \frac{\overline{a, !(a) \multimap b : b \vdash b}}{a, !(a) \multimap b : !(a) \multimap b \vdash b} \multimap$$

$$\frac{\frac{a, !(a) \multimap b : \cdot \vdash b}{a, !(a) \multimap b : \cdot \vdash b} D_C \quad \overline{a, b : \cdot \vdash b}}{\cdot : !(a) \vdash !(!(a) \multimap b) \multimap b \& !(b) \multimap !(a) \multimap b} \star$$

file: KLE-cbn/KLE050+1.p (31 ms)

$$\frac{\overline{b, !(a) \multimap b : \cdot \vdash b} \quad \overline{a, b : \cdot \vdash b}}{\cdot : !(b) \vdash !(!(a) \multimap b) \multimap b \& !(b) \multimap !(a) \multimap b} \star$$

file: KLE-cbn/KLE051+1.p (104 ms)

$$\frac{\frac{\overline{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : \cdot \vdash a}}{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : \cdot \vdash !(a)} ! \quad \frac{\overline{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}}}{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : !(a) \multimap \mathbf{0} \vdash \mathbf{0}} \star}{\frac{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : \cdot \vdash \mathbf{0}}{a, !(a) \multimap b, !(a) \multimap \mathbf{0} : \cdot \vdash \mathbf{0}} D_C} \multimap$$

$$\frac{\frac{\overline{a, !(a) \multimap \mathbf{0} : \cdot \vdash a}}{a, !(a) \multimap \mathbf{0} : \cdot \vdash !(a)} ! \quad \frac{\overline{a, !(a) \multimap \mathbf{0} : \mathbf{0} \vdash b}}{a, !(a) \multimap \mathbf{0} : !(a) \multimap \mathbf{0} \vdash b} \star}{\frac{a, !(a) \multimap \mathbf{0} : \cdot \vdash b}{a, !(a) \multimap \mathbf{0} : \cdot \vdash b} D_C} \multimap$$

$$\cdot : !(!(a) \multimap \mathbf{0}) \vdash !(!(a) \multimap b) \multimap !(a) \multimap \mathbf{0} \& !(a) \multimap \mathbf{0} \multimap !(a) \multimap b$$

file: KLE-cbn/KLE052+1.p (318 ms)

[illegible]

file: KLE-cbn/KLE058+1.p (570 ms)

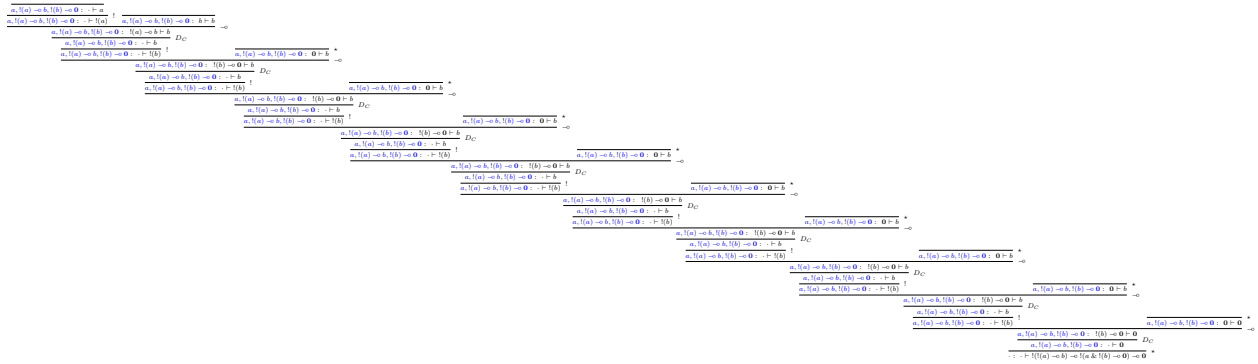
file: KLE-cbn/KLE060+1.p (213 ms)

file: KLE-cbn/KLE061+1.p (64 ms)

file: KLE-cbn/KLE062+1.p (356 ms)

file: KLE-cbn/KLE063+1.p (302 ms)

file: KLE-cbn/KLE064+1.p (244 ms)

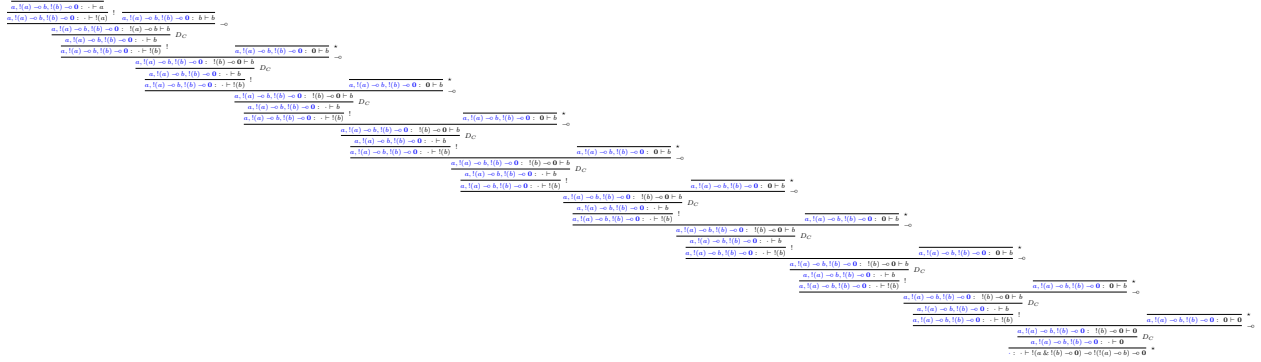




file: KLE-cbn/KLE080+1.p (79 ms)

$$\begin{array}{c}
 \frac{a, b, !(a \rightarrow !(b) \rightarrow 0) : \cdot \vdash a}{a, b, !(a \rightarrow !(b) \rightarrow 0) : \cdot \vdash !(a)} ! \quad \frac{a, b, !(a \rightarrow !(b) \rightarrow 0) : \cdot \vdash b}{a, b, !(a \rightarrow !(b) \rightarrow 0) : \cdot \vdash !(b)} ! \quad \frac{a, b, !(a \rightarrow !(b) \rightarrow 0) : 0 \vdash 0}{a, b, !(a \rightarrow !(b) \rightarrow 0) : !(b) \rightarrow 0 \vdash 0} \star \\
 \frac{a, b, !(a \rightarrow !(b) \rightarrow 0) : !(a) \rightarrow !(b) \rightarrow 0 \vdash 0}{a, b, !(a \rightarrow !(b) \rightarrow 0) : \cdot \vdash 0} D_C \\
 \frac{\cdot : \cdot \vdash !(a \& b) \rightarrow !(a) \rightarrow !(b) \rightarrow 0}{\cdot : \cdot \vdash !(a \& b) \rightarrow !(a) \rightarrow !(b) \rightarrow 0} \star
 \end{array}$$

file: KLE-cbn/KLE081+1.p (269 ms)



file: KLE-cbn/KLE082+1.p (362 ms)



file: KLE-cbn/KLE083+1.p (timeout!)

file: KLE-cbn/KLE084+1.p (28358 ms)



file: KLE-cbn/KLE085+1.p (timeout!)

file: KLE-cbn/KLE086+1.p (timeout!)

file: KLE-cbn/KLE087+1.p (277 ms)

file: KLE-cbn/KLE088+1.p (timeout!)

3.2 LCL Problems

file: ILLTP-cbn/LCL/LCL181+1.p (timeout!)

file: ILLTP-cbn/LCL/LCL230+1.p (timeout!)

3.3 SYJ Problems

file: ILLTP-cbn/SYJ/SYJ101+1.p (24 ms)

$$\frac{a : \cdot \vdash a}{\cdot : !(a) \vdash a} \star$$

file: ILLTP-cbn/SYJ/SYJ102+1.p (70 ms)

$$\frac{\frac{a, !(a) \multimap 0 : \cdot \vdash a}{a, !(a) \multimap 0 : \cdot \vdash !(a)} ! \quad \frac{a, !(a) \multimap 0 : 0 \vdash 0}{a, !(a) \multimap 0 : 0 \vdash 0} \star}{\frac{a, !(a) \multimap 0 : !(a) \multimap 0 \vdash 0}{a, !(a) \multimap 0 : \cdot \vdash 0} D_C \quad \frac{a, !(a) \multimap 0 : \cdot \vdash 0}{\cdot : !(a) \vdash !(a) \multimap 0 \multimap 0} \star} \multimap$$

file: ILLTP-cbn/SYJ/SYJ103+1.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ104+1.p (58 ms)

$$\frac{\frac{a, !(a) \multimap b : \cdot \vdash a}{a, !(a) \multimap b : \cdot \vdash !(a)} ! \quad \frac{a, !(a) \multimap b : b \vdash b}{a, !(a) \multimap b : b \vdash b} \star}{\frac{a, !(a) \multimap b : !(a) \multimap b \vdash b}{a, !(a) \multimap b : \cdot \vdash b} D_C \quad \frac{a, !(a) \multimap b : \cdot \vdash b}{\cdot : !(a) \multimap b \vdash !(a) \multimap b} \star} \multimap$$

file: ILLTP-cbn/SYJ/SYJ105+1.002.p (314 ms)

file: ILLTP-cbn/SYJ/SYJ105+1.003.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ105+1.004.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ106+1.p (1504 ms)

file: ILLTP-cbn/SYJ/SYJ107+1.001.p (479 ms)

$$\frac{\frac{b, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash b \quad b, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash c}{b, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash b \& c} *}{\frac{b, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(b \& c)}{b, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} \oplus_1} \frac{\frac{a, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash a}{a, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a)} !}{\frac{a, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)}{a, c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} \oplus_1} \frac{b, c, !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash b \quad b, c, !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash c}{b, c, !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash b \& c} *}{\frac{b, c, !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(b \& c)}{b, c, !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} \oplus_1} \frac{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)}{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} D_C} \frac{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)}{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} D_C} \frac{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)}{c, !!(b \oplus !!(a), !!(b \oplus !!(a)) \oplus !(b) : \cdot \vdash !!(a) \oplus !(b \& c)} *$$

file: ILLTP-cbn/SYJ/SYJ107+1.002.p (13117 ms)

file: ILLTP-cbn/SYJ/SYJ107+1.003.p (186392 ms)

file: ILLTP-cbn/SYJ/SYJ107+1.004.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.001.p (10921 ms)

file: ILLTP-cbn/SYJ/SYJ201+1.002.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.003.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.004.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.005.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.006.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.007.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.008.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.009.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.010.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.011.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.012.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.013.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.014.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.015.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.016.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.017.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.018.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.019.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ201+1.020.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.001.p (39 ms)

$$\frac{\frac{o11, o21 : \cdot \vdash o11}{o11, o21 : \cdot \vdash !(o11)} !}{o11, o21 : \cdot \vdash !(o11) \oplus !(o21)} \oplus_1$$
$$\cdot : !(o11), !(o21) \vdash !(o11) \oplus !(o21) \quad \star$$

file: ILLTP-cbn/SYJ/SYJ202+1.002.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.003.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.004.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.005.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.006.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.007.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.008.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.009.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.010.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.011.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.012.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.013.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.014.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.015.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.016.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.017.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.018.p (timeout!)

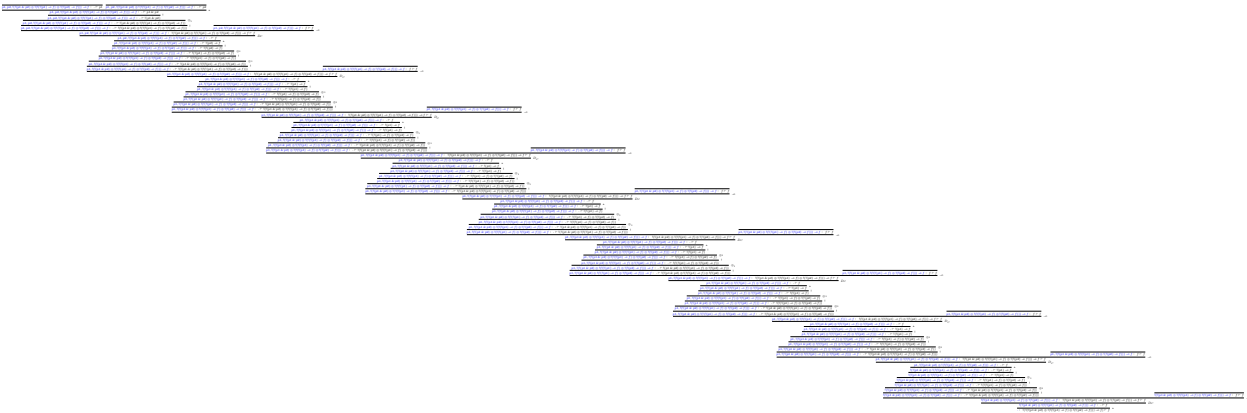
file: ILLTP-cbn/SYJ/SYJ202+1.019.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ202+1.020.p (timeout!)

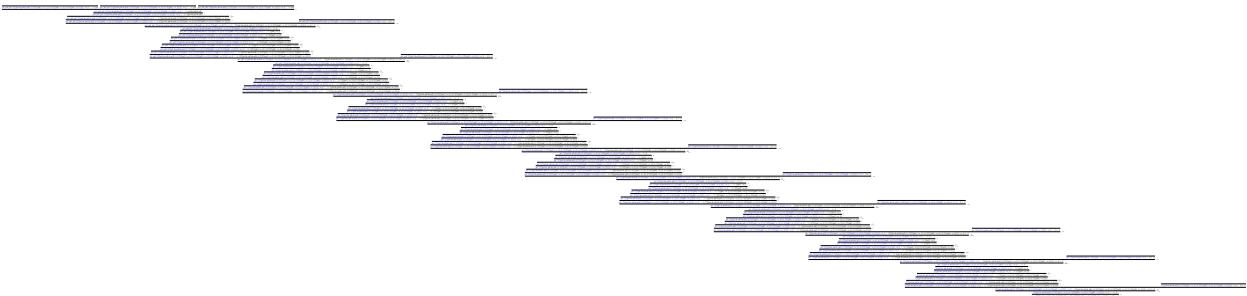
file: ILLTP-cbn/SYJ/SYJ203+1.001.p (322 ms)

$$\frac{\frac{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash p1}{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1)} !}{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1) \oplus !(p1 \multimap f)} \oplus_1$$
$$\frac{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1) \oplus !(p1 \multimap f)}{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))} ! \quad \frac{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : f \vdash f}{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : !(p1 \oplus !(p1 \multimap f)) \multimap f \vdash f} \multimap$$
$$\frac{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : f \vdash f}{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : !(p1 \oplus !(p1 \multimap f)) \multimap f \vdash f} D_C$$
$$\frac{p1, !(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash f}{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \multimap f)} \star$$
$$\frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \multimap f)}{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))} !$$
$$\frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))}{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))} \oplus_1$$
$$\frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))}{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash !(p1 \oplus !(p1 \multimap f))} ! \quad \frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : f \vdash f}{!(p1 \oplus !(p1 \multimap f)) \multimap f : !(p1 \oplus !(p1 \multimap f)) \multimap f \vdash f} \multimap$$
$$\frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : f \vdash f}{!(p1 \oplus !(p1 \multimap f)) \multimap f : !(p1 \oplus !(p1 \multimap f)) \multimap f \vdash f} D_C$$
$$\frac{!(p1 \oplus !(p1 \multimap f)) \multimap f : \cdot \vdash f}{\cdot : !(p1 \oplus !(p1 \multimap f)) \multimap f \vdash f} \star$$

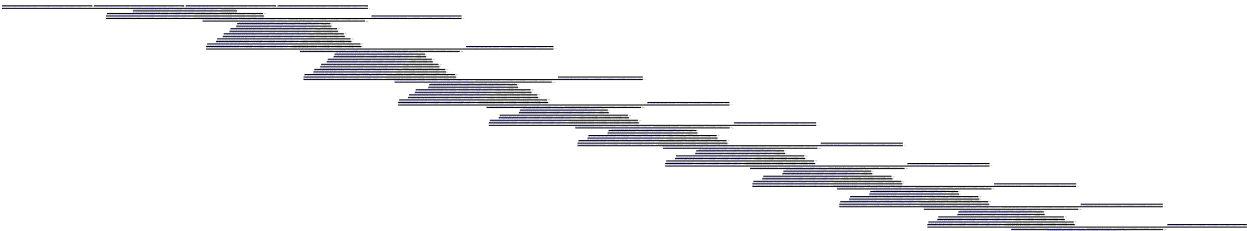
file: ILLTP-cbn/SYJ/SYJ203+1.002.p (2117 ms)



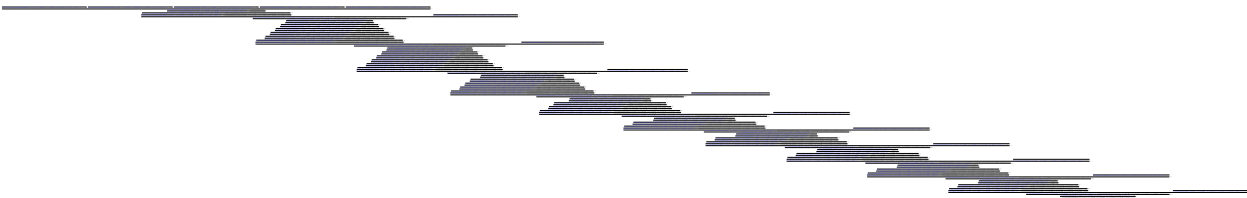
file: ILLTP-cbn/SYJ/SYJ203+1.003.p (2233 ms)



file: ILLTP-cbn/SYJ/SYJ203+1.004.p (2900 ms)



file: ILLTP-cbn/SYJ/SYJ203+1.005.p (4348 ms)



file: ILLTP-cbn/SYJ/SYJ203+1.006.p (7610 ms)

Not shown due to L^AT_EX restrictions.

file: ILLTP-cbn/SYJ/SYJ203+1.007.p (16481 ms)

Not shown due to L^AT_EX restrictions.

file: ILLTP-cbn/SYJ/SYJ203+1.008.p (32963 ms)

Not shown due to L^AT_EX restrictions.

file: ILLTP-cbn/SYJ/SYJ203+1.009.p (59870 ms)

Not shown due to L^AT_EX restrictions.

file: ILLTP-cbn/SYJ/SYJ203+1.010.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.011.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.012.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.013.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.014.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.015.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.016.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.017.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.018.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.019.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ203+1.020.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.001.p (67 ms)

$$\begin{array}{c}
 \frac{}{p1,!(p1) \multimap !(p1) \multimap p0 : \cdot \vdash p1} \\
 \frac{}{p1,!(p1) \multimap !(p1) \multimap p0 : \cdot \vdash !(p1)} ! \\
 \frac{}{p1,!(p1) \multimap !(p1) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p1,!(p1) \multimap !(p1) \multimap p0 : !(p1) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p1,!(p1) \multimap !(p1) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p1),!(p1) \multimap !(p1) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.002.p (279 ms)

$$\begin{array}{c}
 \frac{}{p2,!(p2) \multimap !(p2) \multimap p0 : \cdot \vdash p2} \\
 \frac{}{p2,!(p2) \multimap !(p2) \multimap p0 : \cdot \vdash !(p2)} ! \\
 \frac{}{p2,!(p2) \multimap !(p2) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p2,!(p2) \multimap !(p2) \multimap p0 : !(p2) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p2,!(p2) \multimap !(p2) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p2),!(p2) \multimap !(p2) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.003.p (421 ms)

$$\begin{array}{c}
 \frac{}{p3,!(p3) \multimap !(p3) \multimap p0 : \cdot \vdash p3} \\
 \frac{}{p3,!(p3) \multimap !(p3) \multimap p0 : \cdot \vdash !(p3)} ! \\
 \frac{}{p3,!(p3) \multimap !(p3) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p3,!(p3) \multimap !(p3) \multimap p0 : !(p3) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p3,!(p3) \multimap !(p3) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p3),!(p3) \multimap !(p3) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.004.p (790 ms)

$$\begin{array}{c}
 \frac{}{p4,!(p4) \multimap !(p4) \multimap p0 : \cdot \vdash p4} \\
 \frac{}{p4,!(p4) \multimap !(p4) \multimap p0 : \cdot \vdash !(p4)} ! \\
 \frac{}{p4,!(p4) \multimap !(p4) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p4,!(p4) \multimap !(p4) \multimap p0 : !(p4) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p4,!(p4) \multimap !(p4) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p4),!(p4) \multimap !(p4) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.005.p (1831 ms)

$$\begin{array}{c}
 \frac{}{p5,!(p5) \multimap !(p5) \multimap p0 : \cdot \vdash p5} \\
 \frac{}{p5,!(p5) \multimap !(p5) \multimap p0 : \cdot \vdash !(p5)} ! \\
 \frac{}{p5,!(p5) \multimap !(p5) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p5,!(p5) \multimap !(p5) \multimap p0 : !(p5) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p5,!(p5) \multimap !(p5) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p5),!(p5) \multimap !(p5) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.006.p (5235 ms)

$$\begin{array}{c}
 \frac{}{p6,!(p6) \multimap !(p6) \multimap p0 : \cdot \vdash p6} \\
 \frac{}{p6,!(p6) \multimap !(p6) \multimap p0 : \cdot \vdash !(p6)} ! \\
 \frac{}{p6,!(p6) \multimap !(p6) \multimap p0 : p0 \vdash p0} \multimap \\
 \frac{}{p6,!(p6) \multimap !(p6) \multimap p0 : !(p6) \multimap p0 \vdash p0} \multimap \\
 \frac{}{p6,!(p6) \multimap !(p6) \multimap p0 : \cdot \vdash p0} D_C \\
 \frac{}{\cdot : !(p6),!(p6) \multimap !(p6) \multimap p0 \vdash p0} \star
 \end{array}$$

file: ILLTP-cbn/SYJ/SYJ204+1.007.p (18285 ms)

file: ILLTP-cbn/SYJ/SYJ204+1.008.p (233894 ms)

Not shown due to L^AT_EX restrictions.

file: ILLTP-cbn/SYJ/SYJ204+1.009.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.010.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.011.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.012.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.013.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.014.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.015.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.016.p (timeout!)

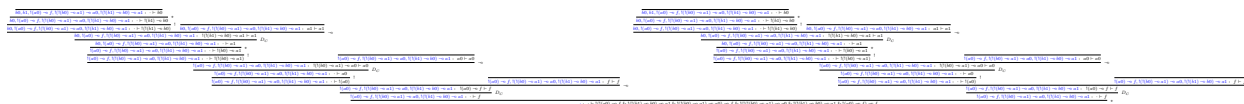
file: ILLTP-cbn/SYJ/SYJ204+1.017.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.018.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.019.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ204+1.020.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.001.p (2858 ms)



file: ILLTP-cbn/SYJ/SYJ205+1.002.p (5722 ms)



file: ILLTP-cbn/SYJ/SYJ205+1.003.p (8821 ms)



file: ILLTP-cbn/SYJ/SYJ205+1.004.p (17740 ms)



file: ILLTP-cbn/SYJ/SYJ205+1.005.p (81907 ms)



file: ILLTP-cbn/SYJ/SYJ205+1.006.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.007.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.008.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.009.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.010.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ205+1.011.p (timeout!)


```
file: ILLTP-cbn/SYJ/SYJ205+1.013.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ205+1.015.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ205+1.017.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ205+1.018.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ205+1.019.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ205+1.020.p (timeout!)
```

file: ILLTP-cbn/SYJ/SYJ206+1.001.p (24 ms)

$$\frac{\overline{a1 : \cdot \vdash a1} \quad \overline{a1 : \cdot \vdash a1}}{\cdot : \cdot \vdash !(a1) \multimap a1 \& !(a1) \multimap a1} \star$$

$$\begin{array}{c}
\frac{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1} \quad \frac{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1}{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1} \quad \frac{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1}{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1} \quad \frac{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1}{a1.(a2) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a1} \\
\frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \\
\frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2} \quad \frac{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}{a2.(a1) \Rightarrow a2.(a2) \Rightarrow a1 : \vdash a2}
\end{array}$$

Figure 1: A schematic diagram of the experimental design. It shows a sequence of steps: 1. Pre-test (N=100) leading to 2. Main test (N=100) leading to 3. Post-test (N=100). The main test is divided into two groups: Control (N=50) and Experimental (N=50). The experimental group is further divided into two sub-groups: Experimental 1 (N=25) and Experimental 2 (N=25). The control group is also divided into two sub-groups: Control 1 (N=25) and Control 2 (N=25). The diagram illustrates the flow of participants through the different stages and groups of the study.

```
file: ILLTP-cbn/SYJ/SYJ206+1.005.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.006.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.007.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.008.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.009.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.010.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.011.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.012.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.013.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.014.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.015.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.016.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.017.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.018.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.019.p (timeout!)
```

```
file: ILLTP-cbn/SYJ/SYJ206+1.020.p (timeout!)
```

file: ILLTP-cbn/SYJ/SYJ207+1.001.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.002.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.003.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.004.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.005.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.006.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.007.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.008.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.009.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.010.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.011.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.012.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.013.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.014.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.015.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.016.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.017.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.018.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.019.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ207+1.020.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.001.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.002.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.003.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.004.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.005.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.006.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.007.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.008.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.009.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.010.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.011.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.012.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.013.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.014.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.015.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.016.p (timeout!)

file: ILLTP-cbn/SYJ/SYJ208+1.017.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.018.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.019.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ208+1.020.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.001.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.002.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.003.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.004.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.005.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.006.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.007.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.008.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.009.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.010.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.011.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.012.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.013.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.014.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.015.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.016.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.017.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.018.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.019.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ209+1.020.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.001.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.002.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.003.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.004.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.005.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.006.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.007.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.008.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.009.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.010.p (timeout!)
file: ILLTP-cbn/SYJ/SYJ210+1.011.p (timeout!)

file: ILLTP-cbn/SYN/SYN046+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN047+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN387+1.p **fail** (19 ms)

file: ILLTP-cbn/SYN/SYN388+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN389+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN390+1.p (25 ms)

$$\frac{\overline{p : \cdot \vdash p} \quad \overline{p : \cdot \vdash p}}{\cdot : \cdot \vdash !(p) \multimap p \ \& \ !(p) \multimap p} \star$$

file: ILLTP-cbn/SYN/SYN391+1.p (541 ms)

file: ILLTP-cbn/SYN/SYN392+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN393+1.p (timeout!)

file: ILLTP-cbn/SYN/SYN416+1.p **fail** (20 ms)

file: ILLTP-cbn/SYN/SYN915+1.p **fail** (18 ms)

file: ILLTP-cbn/SYN/SYN916+1.p **fail** (21 ms)

file: ILLTP-cbn/SYN/SYN977+1.p **fail** (25 ms)

file: ILLTP-cbn/SYN/SYN978+1.p (32 ms)

$$\frac{\overline{a, b : \cdot \vdash b} \quad \overline{a, b : \cdot \vdash a}}{\cdot : \cdot \vdash !(a \ \& \ b) \multimap !(a) \multimap b \ \& \ !(b) \multimap a} \star$$

4 Translation Call-by-Value

4.1 KLE Problems

file: KLE-cbv/KLE001+1.p (38 ms)

$$\frac{\overline{a : \cdot \vdash a} \quad !}{a : \cdot \vdash !(a)} \quad !$$
$$\frac{\cdot : \cdot \vdash !(a) \multimap !(a)}{\cdot : \cdot \vdash !(a) \multimap !(a)} \star$$

file: KLE-cbv/KLE002+1.p (294 ms)

file: KLE-cbv/KLE006+1.p (291 ms)

$$\begin{array}{c}
\frac{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash a}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(a)} !}{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(a)}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(b)} !} \quad \frac{\frac{a, b, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(c) : !(b) \vdash b} \star}{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : !(a) \multimap !(b) \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash b} D_C} \multimap \\
\frac{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash b}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(b)} !}{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(b)}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(c)} !} \quad \frac{\frac{a, c, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash c}{a, c, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(c)} !}{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : !(c) \vdash !(c)}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(c)} \star} \multimap \\
\frac{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : !(b) \multimap !(c) \vdash !(c)}{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(c)} D_C}{\frac{a, !(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(c)}{!(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(a) \multimap !(c)} \star} \star \\
\frac{!(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(a) \multimap !(c)}{!(a) \multimap !(b), !(b) \multimap !(c) : \cdot \vdash !(!(a) \multimap !(c))} ! \star \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(b) \multimap !(c)) \multimap !(a) \multimap !(c)}{!(a) \multimap !(b) : \cdot \vdash !(!(b) \multimap !(c)) \multimap !(a) \multimap !(c))} ! \star \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(b) \multimap !(c)) \multimap !(a) \multimap !(c))}{\cdot : !(a) \multimap !(b) \vdash !(!(b) \multimap !(c)) \multimap !(a) \multimap !(c))} \star
\end{array}$$

file: KLE-cbv/KLE007+1.p (293 ms)

$$\begin{array}{c}
\frac{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash c}{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(c)} !}{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(c)}{c, !(a) \multimap !(b), !(c) \multimap !(a) : !(c) \vdash a} D_C} \multimap \\
\frac{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash a}{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(a)} !}{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(a)}{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(b)} !} \quad \frac{\frac{b, c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash b}{b, c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(b)} !}{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : !(b) \vdash !(b)}{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(b)} \star} \multimap \\
\frac{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : !(a) \multimap !(b) \vdash !(b)}{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(b)} D_C}{\frac{c, !(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(b)}{!(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(c) \multimap !(b)} \star} \star \\
\frac{!(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(c) \multimap !(b)}{!(a) \multimap !(b), !(c) \multimap !(a) : \cdot \vdash !(!(c) \multimap !(b))} ! \star \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(c) \multimap !(a)) \multimap !(c) \multimap !(b)}{!(a) \multimap !(b) : \cdot \vdash !(!(c) \multimap !(a)) \multimap !(c) \multimap !(b))} ! \star \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(!(c) \multimap !(a)) \multimap !(c) \multimap !(b))}{\cdot : !(a) \multimap !(b) \vdash !(!(c) \multimap !(a)) \multimap !(c) \multimap !(b))} \star
\end{array}$$

file: KLE-cbv/KLE008+1.p (232 ms)

$$\begin{array}{c}
\frac{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash a}{a, c, !(a) \multimap !(b) : \cdot \vdash !(a)} !}{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash !(a)}{a, c, !(a) \multimap !(b) : !(b) \vdash b} \star} \multimap \\
\frac{\frac{a, c, !(a) \multimap !(b) : !(a) \multimap !(b) \vdash b}{a, c, !(a) \multimap !(b) : \cdot \vdash b} D_C}{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash b}{a, c, !(a) \multimap !(b) : \cdot \vdash !(b)} !} \quad \frac{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash c}{a, c, !(a) \multimap !(b) : \cdot \vdash !(c)} !}{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash !(c)}{a, c, !(a) \multimap !(b) : \cdot \vdash !(b) \otimes !(c)} !} \otimes \\
\frac{\frac{a, c, !(a) \multimap !(b) : \cdot \vdash !(b) \otimes !(c)}{!(a) \multimap !(b) : \cdot \vdash !(a) \otimes !(c) \multimap !(b) \otimes !(c)} \star}{\frac{!(a) \multimap !(b) : \cdot \vdash !(a) \otimes !(c) \multimap !(b) \otimes !(c)}{!(a) \multimap !(b) : \cdot \vdash !(a) \otimes !(c) \multimap !(b) \otimes !(c))} !} \star \\
\frac{!(a) \multimap !(b) : \cdot \vdash !(a) \otimes !(c) \multimap !(b) \otimes !(c))}{\cdot : !(a) \multimap !(b) \vdash !(a) \otimes !(c) \multimap !(b) \otimes !(c))} \star
\end{array}$$

file: KLE-cbv/KLE009+1.p (233 ms)

$$\frac{\frac{\frac{a, b : \cdot \vdash b}{a, b : \cdot \vdash !(b)} !}{b : \cdot \vdash !(a) \multimap !(b)} \star}{b : \cdot \vdash !(a) \multimap !(b)} !}{\cdot : !(b) \vdash !(a) \multimap !(b)} \star$$

```
file: KLE-cbv/KLE015+1.p (timeout!)
```

```
file: KLE-cbv/KLE016+1.p (253 ms)
```

$$\begin{array}{c}
\frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \cdot \vdash b}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \cdot \vdash !(b)} ! \quad \frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \cdot \vdash !(b)} \star \\
\frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \cdot \vdash a}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(a)} ! \quad \frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : !(b) \multimap \mathbf{0} \vdash \mathbf{0}}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}), !(b) \multimap \mathbf{0} : \cdot \vdash \mathbf{0}} D_C \\
\frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(a)}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : !(b) \multimap \mathbf{0} \vdash \mathbf{0}} \star \\
\frac{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : !(a) \multimap !(!(b) \multimap \mathbf{0}) \vdash \mathbf{0}}{a, b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash \mathbf{0}} D_C \\
\frac{b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(a) \multimap \mathbf{0}}{b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(a)} \star \\
\frac{b, !(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(a)}{!(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(b) \multimap !(a)} ! \\
\frac{!(a) \multimap !(!(b) \multimap \mathbf{0}) : \cdot \vdash !(b) \multimap !(a)}{\cdot : !(a) \multimap !(!(b) \multimap \mathbf{0}) \vdash !(b) \multimap !(a)} ! \\
\frac{\cdot : !(a) \multimap !(!(b) \multimap \mathbf{0}) \vdash !(b) \multimap !(a)}{\cdot : !(a) \multimap !(!(b) \multimap \mathbf{0}) \vdash !(b) \multimap !(a)} \star
\end{array}$$

```
file: KLE-cbv/KLE017+1.p (timeout!)
```

file: KLE-cbv/KLE018+1.p (462 ms)

file: KLE-cbv/KLE019+1.p (334 ms)

[illegible]

```
file: KLE-cbv/KLE020+1.p (266 ms)
```

$$\begin{array}{c}
\frac{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} \quad \frac{\frac{}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} \quad !}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad !}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad ! \quad \frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \vdash !(b)} \quad \star}{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \multimap !(b) \vdash !(b)} \quad D_C} \quad \multimap \\
\frac{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad \star}{\frac{}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a) \multimap !(b)} \quad \star} \quad \frac{}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(!(a) \multimap !(b))} \quad !}{\frac{}{\cdot : !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a)) \vdash !(!(a) \multimap !(b))} \quad \star} \quad \star
\end{array}$$

file: KLE-cbv/KLE021+1.p (246 ms)

$$\begin{array}{c}
\frac{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} \quad \frac{\frac{}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} \quad !}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad !}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad ! \quad \frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \vdash !(a)} \quad \star}{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \multimap !(a) \vdash !(a)} \quad D_C} \quad \multimap \\
\frac{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad \star}{\frac{}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b) \multimap !(a)} \quad \star} \quad \frac{}{!(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(!(b) \multimap !(a))} \quad !}{\frac{}{\cdot : !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a)) \vdash !(!(b) \multimap !(a))} \quad \star} \quad \star
\end{array}$$

file: KLE-cbv/KLE022+1.p (227 ms)

$$\begin{array}{c}
\frac{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} \quad \frac{\frac{}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} \quad !}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad !}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad ! \quad \frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \vdash !(b)} \quad \star}{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \multimap !(b) \vdash !(b)} \quad D_C} \quad \multimap \\
\frac{\frac{}{a, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad \star}{\frac{}{\cdot : !(a), !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a)) \vdash !(b)} \quad \star} \quad \star
\end{array}$$

file: KLE-cbv/KLE023+1.p (231 ms)

$$\begin{array}{c}
\frac{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash b} \quad \frac{\frac{}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash a} \quad !}{a, b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad !}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(b)} \quad ! \quad \frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(a) \vdash !(a)} \quad \star}{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : !(b) \multimap !(a) \vdash !(a)} \quad D_C} \quad \multimap \\
\frac{\frac{}{b, !(a) \multimap !(b), !(b) \multimap !(a) : \cdot \vdash !(a)} \quad \star}{\frac{}{\cdot : !(b), !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a)) \vdash !(a)} \quad \star} \quad \star
\end{array}$$

$$\frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star \frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star}{\vdots : \vdash !(a) \multimap !(a)} ! \quad \frac{\frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star \frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star}{\vdots : \vdash !(a) \multimap !(a)} !}{\vdots : \vdash !(a) \multimap !(a)} \otimes \frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star \frac{\frac{\frac{a : \vdash a}{a : \vdash !a} !}{\vdots : \vdash !(a) \multimap !(a)} \star}{\vdots : \vdash !(a) \multimap !(a)} !}{\vdots : \vdash !(a) \multimap !(a)} \otimes$$
[illegible]

The Gantt chart illustrates the project schedule for the 'Development of a New Product' project. The project is divided into three main phases: Phase 1: Planning and Design, Phase 2: Development and Testing, and Phase 3: Deployment and Support. Each phase contains multiple tasks with associated start and end dates, represented by horizontal bars. The chart shows a clear progression of tasks over time, with some tasks overlapping and others sequential.

Task Name	Start Date	End Date
Project Kick-off	2023-01-01	2023-01-05
Define Project Scope	2023-01-05	2023-01-10
Identify Stakeholders	2023-01-05	2023-01-10
Develop Project Charter	2023-01-10	2023-01-15
Conduct Initial Meetings	2023-01-10	2023-01-15
Finalize Project Charter	2023-01-15	2023-01-20
Develop Project Management Plan	2023-01-20	2023-01-25
Identify Risks	2023-01-20	2023-01-25
Develop Risk Register	2023-01-25	2023-01-30
Finalize Project Management Plan	2023-01-30	2023-02-05
Develop Work Breakdown Structure	2023-02-05	2023-02-10
Identify Resources	2023-02-05	2023-02-10
Develop Resource Management Plan	2023-02-10	2023-02-15
Finalize Work Breakdown Structure	2023-02-15	2023-02-20
Develop Communication Management Plan	2023-02-20	2023-02-25
Identify Stakeholders	2023-02-20	2023-02-25
Develop Stakeholder Engagement Plan	2023-02-25	2023-03-01
Finalize Communication Management Plan	2023-03-01	2023-03-05
Develop Procurement Management Plan	2023-03-05	2023-03-10
Identify Potential Vendors	2023-03-05	2023-03-10
Develop Procurement Statement of Work	2023-03-10	2023-03-15
Finalize Procurement Management Plan	2023-03-15	2023-03-20
Develop Quality Management Plan	2023-03-20	2023-03-25
Identify Quality Standards	2023-03-20	2023-03-25
Develop Quality Checklists	2023-03-25	2023-03-30
Finalize Quality Management Plan	2023-03-30	2023-04-05
Develop Change Management Plan	2023-04-05	2023-04-10
Identify Change Risks	2023-04-05	2023-04-10
Develop Change Request Process	2023-04-10	2023-04-15
Finalize Change Management Plan	2023-04-15	2023-04-20
Develop Project Schedule	2023-04-20	2023-04-25
Identify Activities	2023-04-20	2023-04-25
Develop Activity Duration Estimates	2023-04-25	2023-04-30
Finalize Project Schedule	2023-04-30	2023-05-05
Develop Project Budget	2023-05-05	2023-05-10
Identify Budget Items	2023-05-05	2023-05-10
Develop Budget Estimates	2023-05-10	2023-05-15
Finalize Project Budget	2023-05-15	2023-05-20
Develop Project Charter	2023-05-20	2023-05-25
Identify Stakeholders	2023-05-20	2023-05-25
Develop Stakeholder Engagement Plan	2023-05-25	2023-05-30
Finalize Project Charter	2023-05-30	2023-06-05
Develop Project Management Plan	2023-06-05	2023-06-10
Identify Risks	2023-06-05	2023-06-10
Develop Risk Register	2023-06-10	2023-06-15
Finalize Project Management Plan	2023-06-15	2023-06-20
Develop Work Breakdown Structure	2023-06-20	2023-06-25
Identify Resources	2023-06-20	2023-06-25
Develop Resource Management Plan	2023-06-25	2023-06-30
Finalize Work Breakdown Structure	2023-06-30	2023-07-05
Develop Communication Management Plan	2023-07-05	2023-07-10
Identify Stakeholders	2023-07-05	2023-07-10
Develop Stakeholder Engagement Plan	2023-07-10	2023-07-15
Finalize Communication Management Plan	2023-07-15	2023-07-20
Develop Procurement Management Plan	2023-07-20	2023-07-25
Identify Potential Vendors	2023-07-20	2023-07-25
Develop Procurement Statement of Work	2023-07-25	2023-07-30
Finalize Procurement Management Plan	2023-07-30	2023-08-05
Develop Quality Management Plan	2023-08-05	2023-08-10
Identify Quality Standards	2023-08-05	2023-08-10
Develop Quality Checklists	2023-08-10	2023-08-15
Finalize Quality Management Plan	2023-08-15	2023-08-20
Develop Change Management Plan	2023-08-20	2023-08-25
Identify Change Risks	2023-08-20	2023-08-25
Develop Change Request Process	2023-08-25	2023-08-30
Finalize Change Management Plan	2023-08-30	2023-09-05
Develop Project Schedule	2023-09-05	2023-09-10
Identify Activities	2023-09-05	2023-09-10
Develop Activity Duration Estimates	2023-09-10	2023-09-15
Finalize Project Schedule	2023-09-15	2023-09-20
Develop Project Budget	2023-09-20	2023-09-25
Identify Budget Items	2023-09-20	2023-09-25
Develop Budget Estimates	2023-09-25	2023-09-30
Finalize Project Budget	2023-09-30	2023-10-05
Develop Project Charter	2023-10-05	2023-10-10
Identify Stakeholders	2023-10-05	2023-10-10
Develop Stakeholder Engagement Plan	2023-10-10	2023-10-15
Finalize Project Charter	2023-10-15	2023-10-20
Develop Project Management Plan	2023-1	

The diagram is a complex, multi-layered structure of text boxes connected by lines, resembling a tree or a complex network. The boxes contain various text elements, including names, dates, and references, arranged in a descending staircase pattern from top-left to bottom-right. The text is small and difficult to read, but it appears to be a detailed record or a complex organizational chart. The overall layout is dense and intricate, with many branches and sub-branches.

The Gantt chart illustrates the project schedule for the 'Development of a New Product' project. The timeline spans from 0 to 100 weeks. The chart shows a complex sequence of tasks, with some tasks running in parallel and others sequentially. The overall project duration is approximately 100 weeks.

Task Name	Start Week	End Week	Duration (Weeks)
Project Initiation	0	5	5
Requirement Gathering	5	15	10
Product Design	15	30	15
Development	30	45	15
Testing	45	60	15
Deployment	60	75	15
Post-Launch Support	75	100	25

file: KLE-cbv/KLE032+1.p (483 ms)

file: KLE-cbv/KLE033+1.p (909 ms)

[illegible][illegible][illegible]

$$\begin{array}{c}
\frac{\overline{a, b : \cdot \vdash a}}{a, b : \cdot \vdash !(a)} ! \\
\frac{\overline{b : \cdot \vdash !(a) \otimes !(b) \multimap !(a)}}{b : \cdot \vdash !(!(a) \otimes !(b) \multimap !(a))} ! \quad \star \quad \frac{\overline{a, b : \cdot \vdash a} \quad \overline{a, b : \cdot \vdash b}}{a, b : \cdot \vdash !(a)} ! \quad \frac{\overline{a, b : \cdot \vdash b}}{a, b : \cdot \vdash !(b)} ! \\
\frac{\overline{b : \cdot \vdash !(a) \otimes !(b)}}{b : \cdot \vdash !(a) \otimes !(b)} \otimes \quad \frac{\overline{b : \cdot \vdash !(a) \multimap !(a) \otimes !(b)}}{b : \cdot \vdash !(!(a) \multimap !(a) \otimes !(b))} ! \quad \star \\
\frac{\overline{b : \cdot \vdash !(!(a) \otimes !(b) \multimap !(a)) \otimes !(!(a) \multimap !(a) \otimes !(b))}}{\cdot : !(b) \vdash !(!(a) \otimes !(b) \multimap !(a)) \otimes !(!(a) \multimap !(a) \otimes !(b))} \star
\end{array}$$

file: KLE-cbv/KLE054+1.p (103 ms)

$$\begin{array}{c}
\frac{\overline{a, b : \cdot \vdash b}}{a, b : \cdot \vdash !(b)} ! \quad \frac{\overline{b : \cdot \vdash b}}{b : \cdot \vdash !(b)} ! \quad \frac{\overline{b : \cdot \vdash b}}{b : \cdot \vdash !(b)} ! \quad \frac{\overline{b : \cdot \vdash b}}{b : \cdot \vdash !(b)} ! \\
\frac{\overline{b : \cdot \vdash !(a) \oplus !(b) \multimap !(b)}}{b : \cdot \vdash !(!(a) \oplus !(b) \multimap !(b))} ! \quad \star \quad \frac{\overline{b : \cdot \vdash !(b) \oplus !(a) \oplus !(b)}}{b : \cdot \vdash !(b) \oplus !(a) \oplus !(b)} \oplus_1 \quad \star \\
\frac{\overline{b : \cdot \vdash !(!(a) \oplus !(b) \multimap !(b)) \otimes !(!(b) \multimap !(a) \oplus !(b))}}{\cdot : !(b) \vdash !(!(a) \oplus !(b) \multimap !(b)) \otimes !(!(b) \multimap !(a) \oplus !(b))} \star
\end{array}$$

file: KLE-cbv/KLE055+1.p (239 ms)

$$\begin{array}{c}
\frac{\overline{a, b, !(b) \multimap \mathbf{0} : \cdot \vdash b}}{a, b, !(b) \multimap \mathbf{0} : \cdot \vdash !(b)} ! \quad \frac{\overline{b, !(b) \multimap \mathbf{0} : \cdot \vdash b}}{b, !(b) \multimap \mathbf{0} : \cdot \vdash !(b)} ! \quad \frac{\overline{b, !(b) \multimap \mathbf{0} : \mathbf{0} \vdash !(a) \otimes !(b)}}{b, !(b) \multimap \mathbf{0} : \mathbf{0} \vdash !(a) \otimes !(b)} \star \\
\frac{\overline{!(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b) \multimap !(b)}}{!(b) \multimap \mathbf{0} : \cdot \vdash !(!(a) \otimes !(b) \multimap !(b))} ! \quad \star \quad \frac{\overline{b, !(b) \multimap \mathbf{0} : !(b) \multimap \mathbf{0} \vdash !(a) \otimes !(b)}}{b, !(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b)} D_C \quad \star \\
\frac{\overline{!(b) \multimap \mathbf{0} : \cdot \vdash !(!(b) \multimap !(a) \otimes !(b))}}{!(b) \multimap \mathbf{0} : \cdot \vdash !(!(b) \multimap !(a) \otimes !(b))} ! \quad \star \quad \frac{\overline{!(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b) \multimap !(b)}}{!(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b) \multimap !(b)} \otimes \\
\frac{\overline{!(b) \multimap \mathbf{0} : \cdot \vdash !(!(a) \otimes !(b) \multimap !(b)) \otimes !(!(b) \multimap !(a) \otimes !(b))}}{\cdot : !(b) \multimap \mathbf{0} \vdash !(!(a) \otimes !(b) \multimap !(b)) \otimes !(!(b) \multimap !(a) \otimes !(b))} \star
\end{array}$$

file: KLE-cbv/KLE056+1.p (293 ms)

file: KLE-cbv/KLE057+1.p (85 ms)

file: KLE-cbv/KLE058+1.p (557 ms)

file: KLE-cbv/KLE059+1.p (400 ms)

file: KLE-cbv/KLE060+1.p (434 ms)

file: KLE-cbv/KLE061+1.p (71 ms)

The diagram illustrates the process of 'Producing a new product' (G1) as a goal. This goal is decomposed into several sub-goals (G2-G10) and tasks (T1-T10). The sub-goals are: G2: Designing a new product; G3: Developing a new product; G4: Manufacturing a new product; G5: Distributing a new product; G6: Marketing a new product; G7: Selling a new product; G8: Supporting a new product; G9: Maintaining a new product; G10: Improving a new product. The tasks are: T1: Designing a new product; T2: Developing a new product; T3: Manufacturing a new product; T4: Distributing a new product; T5: Marketing a new product; T6: Selling a new product; T7: Supporting a new product; T8: Maintaining a new product; T9: Improving a new product; T10: Designing a new product. The diagram shows how these tasks and sub-goals contribute to the overall goal of producing a new product.

[illegible][illegible]
$$\frac{\frac{a, b : \cdot \vdash a}{a, b : \cdot \vdash !(a)} ! \quad \frac{a, !(b) \multimap \mathbf{0} : \cdot \vdash a}{a, !(b) \multimap \mathbf{0} : \cdot \vdash !(a)} !}{\cdot : \cdot \vdash !(a) \otimes !(b) \oplus (!(b) \multimap \mathbf{0}) \multimap !(a)} \star$$
$$\frac{\frac{a : \cdot \vdash a}{a : \cdot \vdash !(a)} ! \quad \frac{\frac{\frac{b, !(b) \multimap \mathbf{0} : \cdot \vdash b}{b, !(b) \multimap \mathbf{0} : \cdot \vdash !(b)} ! \quad \frac{b, !(b) \multimap \mathbf{0} : \mathbf{0} \vdash !(a)}{*}}{\frac{b, !(b) \multimap \mathbf{0} : !(b) \multimap \mathbf{0} \vdash !(a)}{-\circ}} D_C}{\frac{\frac{\cdot : \cdot \vdash !(a) \oplus !(b) \otimes !(!(b) \multimap \mathbf{0}) \multimap !(a)}{*} \quad \frac{\cdot : \cdot \vdash !(!(a) \oplus !(b) \otimes !(!(b) \multimap \mathbf{0}) \multimap !(a))}{!}}{\cdot : \cdot \vdash !(!(a) \oplus !(b) \otimes !(!(b) \multimap \mathbf{0}) \multimap !(a)) \otimes !(!(a) \multimap !(a) \oplus !(b) \otimes !(!(b) \multimap \mathbf{0}))} \star}$$


```
file: KLE-cbv/KLE074+1.p (timeout!)
file: KLE-cbv/KLE075+1.p (timeout!)
file: KLE-cbv/KLE076+1.p (408 ms)
```

```
file: KLE-cbv/KLE077+1.p (233 ms)
```

```
file: KLE-cbv/KLE078+1.p (timeout!)
```

```
file: KLE-cbv/KLE079+1.p (363 ms)
```


file: KLE-cbv/KLE086+1.p (timeout!)

file: KLE-cbv/KLE087+1.p (236 ms)

$$\begin{array}{c}
\frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash a} \\
\frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash !(a)} ! \\
\frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash !(a) \oplus !(b) \multimap \mathbf{0}} \oplus_1 \frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}} \star \\
\frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : !(a) \oplus !(b) \multimap \mathbf{0} \vdash \mathbf{0}} D_C \\
\frac{}{a, b, !(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash \mathbf{0}} \\
\frac{}{!(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b) \multimap \mathbf{0}} \star \\
\frac{}{!(a) \oplus !(b) \multimap \mathbf{0} : \cdot \vdash !(a) \otimes !(b) \multimap \mathbf{0}} ! \\
\frac{}{\cdot : \cdot \vdash !(a) \oplus !(b) \multimap \mathbf{0} \multimap !(a) \otimes !(b) \multimap \mathbf{0}} \star \\
\frac{}{\cdot : \cdot \vdash !(a) \oplus !(b) \multimap \mathbf{0} \multimap !(a) \otimes !(b) \multimap \mathbf{0}} !
\end{array}$$

file: KLE-cbv/KLE088+1.p (timeout!)

4.2 LCL Problems

file: ILLTP-cbv/LCL/LCL181+1.p (timeout!)

file: ILLTP-cbv/LCL/LCL230+1.p (timeout!)

4.3 SYJ Problems

file: ILLTP-cbv/SYJ/SYJ101+1.p (55 ms)

$$\begin{array}{c}
\frac{}{a : \cdot \vdash a} \\
\frac{}{a : \cdot \vdash !(a)} ! \\
\cdot : !(a) \vdash !(a) \star
\end{array}$$

file: ILLTP-cbv/SYJ/SYJ102+1.p (173 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap \mathbf{0} : \cdot \vdash a} \\
\frac{}{a, !(a) \multimap \mathbf{0} : \cdot \vdash !(a)} ! \quad \frac{}{a, !(a) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}} \star \\
\frac{}{a, !(a) \multimap \mathbf{0} : !(a) \multimap \mathbf{0} \vdash \mathbf{0}} D_C \\
\frac{}{a, !(a) \multimap \mathbf{0} : \cdot \vdash \mathbf{0}} \\
\frac{}{a : \cdot \vdash !(a) \multimap \mathbf{0} \multimap \mathbf{0}} \star \\
\frac{}{a : \cdot \vdash !(a) \multimap \mathbf{0} \multimap \mathbf{0}} ! \\
\frac{}{\cdot : !(a) \vdash !(a) \multimap \mathbf{0} \multimap \mathbf{0}} \star
\end{array}$$

file: ILLTP-cbv/SYJ/SYJ103+1.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ104+1.p (238 ms)

$$\begin{array}{c}
\frac{}{a, !(a) \multimap !(b) : \cdot \vdash a} \\
\frac{}{a, !(a) \multimap !(b) : \cdot \vdash !(a)} ! \quad \frac{}{a, b, !(a) \multimap !(b) : \cdot \vdash b} \\
\frac{}{a, !(a) \multimap !(b) : !(b) \vdash !(b)} \star \\
\frac{}{a, !(a) \multimap !(b) : !(a) \multimap !(b) \vdash !(b)} D_C \\
\frac{}{a, !(a) \multimap !(b) : \cdot \vdash !(b)} \\
\frac{}{!(a) \multimap !(b) : \cdot \vdash !(a) \multimap !(b)} \star \\
\frac{}{!(a) \multimap !(b) : \cdot \vdash !(a) \multimap !(b)} ! \\
\frac{}{\cdot : !(a) \multimap !(b) \vdash !(a) \multimap !(b)} \star
\end{array}$$

[illegible]

```
file: ILLTP-cbv/SYJ/SYJ105+1.004.p (timeout!)
```

Age Group	Percentage
18-24	85%
25-34	75%
35-44	65%
45-54	55%
55-64	45%
65-74	35%
75-84	25%
85+	15%

$$\frac{\frac{\frac{b, c : \cdot \vdash \bar{b}}{b, c : \cdot \vdash !(b)} ! \quad \frac{\frac{b, c : \cdot \vdash \bar{c}}{b, c : \cdot \vdash !(c)} !}{\frac{b, c : \cdot \vdash !(b) \otimes !(c)}{b, c : \cdot \vdash !(a) \oplus !(b) \otimes !(c)} \oplus_1} \otimes \quad \frac{\frac{\frac{a, c : \cdot \vdash \bar{a}}{a, c : \cdot \vdash !(a)} ! \quad \frac{\frac{b, c : \cdot \vdash \bar{b}}{b, c : \cdot \vdash !(b)} ! \quad \frac{\frac{b, c : \cdot \vdash \bar{c}}{b, c : \cdot \vdash !(c)} !}{\frac{b, c : \cdot \vdash !(b) \otimes !(c)}{b, c : \cdot \vdash !(a) \oplus !(b) \otimes !(c)} \oplus_1} \otimes \quad \frac{\frac{a, c : \cdot \vdash !(a)}{a, c : \cdot \vdash !(a) \oplus !(b) \otimes !(c)} \oplus_1 \quad \frac{b, c : \cdot \vdash !(b) \otimes !(c)}{b, c : \cdot \vdash !(a) \oplus !(b) \otimes !(c)} \oplus_1}{\cdot : !(c), !(b) \oplus !(a) \oplus !(b) \vdash !(a) \oplus !(b) \otimes !(c)} \star$$

Not shown due to L^AT_EX restrictions.

Not shown due to L^AT_EX restrictions.

Not shown due to L^AT_EX restrictions.

```
file: ILLTP-cbv/SYJ/SYJ201+1.003.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ201+1.005.p (timeout!)
```

file: ILLTP-cbv/SYJ/SYJ201+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.008.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.010.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.011.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.012.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.013.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.014.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.015.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.016.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.017.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.018.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.019.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ201+1.020.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.001.p (42 ms)

$$\frac{\frac{o11, o21 : \cdot \vdash o11}{o11, o21 : \cdot \vdash !(o11)} !}{o11, o21 : \cdot \vdash !(o11) \oplus !(o21)} \oplus^1$$
$$\therefore !(o11), !(o21) \vdash !(o11) \oplus !(o21) \star$$

file: ILLTP-cbv/SYJ/SYJ202+1.002.p (383 ms)

file: ILLTP-cbv/SYJ/SYJ202+1.003.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.004.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.005.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.006.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.008.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.010.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.011.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.012.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.013.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.014.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.015.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.016.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.017.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.018.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.019.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ202+1.020.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.001.p (314 ms)

$$\frac{\frac{\frac{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash p1}{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1)} !}{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \oplus !(!(p1) \rightarrow !f))} \oplus_1 \frac{\frac{\frac{f,p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash f}{f,p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(f)} !}{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : !(f) \vdash !(f)} *}{\frac{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : !(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f \vdash !(f)}{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(f)} D_C} \rightarrow$$
$$\frac{\frac{\frac{p1,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \rightarrow !f}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \rightarrow !f} *}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \rightarrow !f} !}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \oplus !(!(p1) \rightarrow !f)} \oplus_1 \frac{\frac{f,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash f}{f,!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(f)} !}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : !(f) \vdash !(f)} *}{\frac{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : !(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f \vdash !(f)}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(f)} D_C} \rightarrow$$
$$\frac{\frac{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(p1) \oplus !(!(p1) \rightarrow !f)}{!(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f : \cdot \vdash !(f)} *}{\cdot : !(p1) \oplus !(!(p1) \rightarrow !f)) \rightarrow !f \vdash !(f)} *$$

file: ILLTP-cbv/SYJ/SYJ203+1.002.p (1879 ms)

file: ILLTP-cbv/SYJ/SYJ203+1.003.p (18347 ms)

file: ILLTP-cbv/SYJ/SYJ203+1.004.p (180259 ms)

file: ILLTP-cbv/SYJ/SYJ203+1.005.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.006.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.008.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.010.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.011.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.012.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.013.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ203+1.014.p (timeout!)


```
file: ILLTP-cbv/SYJ/SYJ206+1.003.p (28881 ms)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.004.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.005.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.006.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.007.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.008.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.009.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.010.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.011.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.012.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.013.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.014.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.015.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.016.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.017.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.018.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.019.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ206+1.020.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ207+1.001.p (timeout!)
```

file: ILLTP-cbv/SYJ/SYJ207+1.002.p (timeout!)

```
file: ILLTP-cbv/SYJ/SYJ207+1.003.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ207+1.004.p (timeout!)
```

```
file: ILLTP-cbv/SYJ/SYJ207+1.005.p (timeout!)
```

file: ILLTP-cbv/SYJ/SYJ207+1.006.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ207+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ207+1.008.p (timeout!)

file: ILLIP-cbv/SYJ/SYJ207+1.009.p (timeout!)

file: ILLIP-cbv/SYJ/SYJ207+1.010.p (timeout!)

file: 1LL1P-cbv/SYJ/SYJ207+1.011.p (timeout!)

file: 1LL1P-cbV/SYJ/SYJ207+1.012.p (timeout!)

file: 1LL1P-cbV/SYJ/SYJ207+1.013.p (timeout!)

file: ILLIF-cbv/S15/S15207+1.014.p (timeout?)

file: ILLTP-cbv/SYJ/SYJ207+1.015.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ207+1.016.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ207+1.017.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ207+1.018.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ207+1.019.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ207+1.020.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.001.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.002.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.003.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.004.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.005.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.006.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.007.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.008.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.009.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.010.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.011.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.012.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.013.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.014.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.015.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.016.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.017.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.018.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.019.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ208+1.020.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.001.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.002.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.003.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.004.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.005.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.006.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.007.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.008.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ209+1.010.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.011.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.012.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.013.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.014.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.015.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.016.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.017.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.018.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.019.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ209+1.020.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.001.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.002.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.003.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.004.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.005.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.006.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.007.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.008.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.009.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.010.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.011.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.012.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.013.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.014.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.015.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.016.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.017.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.018.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.019.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ210+1.020.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ211+1.001.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ211+1.002.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ211+1.003.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ211+1.004.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ211+1.005.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.006.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.008.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.010.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.011.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.012.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.013.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.014.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.015.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.016.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.017.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.018.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.019.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ211+1.020.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.001.p (565 ms)



file: ILLTP-cbv/SYJ/SYJ212+1.002.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.003.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.004.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.005.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.006.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.007.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.008.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.009.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.010.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.011.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.012.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.013.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.014.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.015.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.016.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.017.p (timeout!)

file: ILLTP-cbv/SYJ/SYJ212+1.018.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ212+1.019.p (timeout!)
file: ILLTP-cbv/SYJ/SYJ212+1.020.p (timeout!)

4.4 SYN Problems

```
file: ILLTP-cbv/SYN/SYN001+1.p (241 ms)
```

$$\frac{\frac{\frac{p, !(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash p}{p, !(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (p)} !}{\frac{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (p) \multimap ! (p)}{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p))} *} \frac{\frac{p, !(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash p}{p, !(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (p)} !}{\frac{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (p) \multimap ! (p)}{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p))} *} \frac{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p))}{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p))} \otimes \frac{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}}{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \mathbf{0} \vdash \mathbf{0}}^* \multimap \frac{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p))}{!(l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p)) \multimap \mathbf{0} : \cdot \vdash ! (l(p) \multimap ! (p)) \otimes !(l(p) \multimap ! (p))} \multimap \mathbf{0} \vdash \mathbf{0} \quad D_C$$

```
file: ILLTP-cbv/SYN/SYN007+1.014.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN040+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN041+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN044+1.p (825 ms)
```

The Gantt chart illustrates the project schedule for the 'Development of a New Product' project. The project is organized into a hierarchical structure with multiple levels of tasks. The top level includes 'Project Initiation', 'Project Planning', 'Project Execution', 'Project Monitoring', and 'Project Closure'. Each of these top-level tasks is further broken down into sub-tasks, which are then further detailed into specific activities. The chart uses a color-coded system: blue for planning, green for execution, yellow for monitoring, and red for closure. The timeline spans from the start of the project to the end, with various milestones and dependencies indicated by arrows and labels.

file: ILLTP-cbv/SYN/SYN045+1.p (225 ms)

[illegible]

```
file: ILLTP-cbv/SYN/SYN046+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN047+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN387+1.p fail (18 ms)
```

```
file: ILLTP-cbv/SYN/SYN388+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN389+1.p (timeout!)
```

```
file: ILLTP-cbv/SYN/SYN390+1.p (52 ms)
```

$$\frac{\frac{\frac{p : \cdot \vdash p}{p : \cdot \vdash ! (p)} !}{\cdot : \cdot \vdash ! (p) \multimap ! (p)} \star \quad \frac{\frac{\frac{p : \cdot \vdash p}{p : \cdot \vdash ! (p)} !}{\cdot : \cdot \vdash ! (p) \multimap ! (p)} \star}{\cdot : \cdot \vdash ! (p) \multimap ! (p)} \star \quad \frac{\cdot : \cdot \vdash ! (p) \multimap ! (p)}{\cdot : \cdot \vdash ! (p) \multimap ! (p)} \otimes$$

file: ILLTP-cbv/SYN/SYN391+1.p (438 ms)

```
file: ILLTP-cbv/SYN/SYN978+1.p (91 ms)
```

$$\begin{array}{c}
\frac{a, b : \cdot \vdash b}{a, b : \cdot \vdash !(b)} ! \\
\frac{\frac{a, b : \cdot \vdash !(a) \multimap !(b)}{a, b : \cdot \vdash !(!(a) \multimap !(b))} \star}{a, b : \cdot \vdash !(!(a) \multimap !(b))} ! \\
\frac{a, b : \cdot \vdash !(b)}{a, b : \cdot \vdash !(a)} ! \\
\frac{\frac{a, b : \cdot \vdash !(b) \multimap !(a)}{a, b : \cdot \vdash !(!(b) \multimap !(a))} \star}{a, b : \cdot \vdash !(!(b) \multimap !(a))} ! \\
\frac{a, b : \cdot \vdash !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a))}{\cdot : \cdot \vdash !(a) \otimes !(b) \multimap !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a))} \otimes \\
\frac{\cdot : \cdot \vdash !(a) \otimes !(b) \multimap !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a))}{\cdot : \cdot \vdash !(!(a) \otimes !(b) \multimap !(!(a) \multimap !(b)) \otimes !(!(b) \multimap !(a)))} \star
\end{array}$$