ETH zürich

Formal Methods and Functional Programming – Assignment 5

Author: Yannis Huber (17-570-110)

Teaching assistant: Tobias Oberdörfer

Headache of the Week

$((A \rightarrow B) \rightarrow A) \rightarrow A \equiv \top$:

$$
\cfrac{
\cfrac{}{\Gamma \vdash A \vee \neg A}\ \text{TND}
\quad
\cfrac{}{\Gamma, A \vdash A}\ \text{axiom}
\quad
\cfrac{
\cfrac{}{\Gamma, \neg A \vdash (A \rightarrow B) \rightarrow A}\ \text{axiom}
\quad
\cfrac{
\cfrac{
\cfrac{}{\Gamma, \neg A, A \vdash \neg A}\ \text{axiom}
\quad
\cfrac{}{\Gamma, \neg A, A \vdash A}\ \text{axiom}
}{\Gamma, \neg A, A \vdash B}\ \neg\text{-E}
}{\cfrac{\Gamma, \neg A \vdash A \rightarrow B}{\Gamma, \neg A \vdash A}}\ \substack{\rightarrow\text{-I} \\ \rightarrow\text{-E}}
}{\Gamma, \neg A \vdash A}
}{
\cfrac{(A \rightarrow B) \rightarrow A \vdash A}{\vdash ((A \rightarrow B) \rightarrow A) \rightarrow A}\ \rightarrow\text{-I}
}\ \vee\text{-E} \quad \Gamma := (A \rightarrow B) \rightarrow A
$$