$$A \wedge B \Rightarrow B \wedge A$$

$$\frac{A \in \Gamma}{\Gamma \vdash A}$$

$$\dfrac{\dfrac{\dfrac{}{A \wedge B \vdash A \wedge B}\alpha}{A \wedge B \vdash B}\wedge\text{-}E_2 \qquad \dfrac{\dfrac{}{A \wedge B \vdash A \wedge B}\alpha}{A \wedge B \vdash A}\wedge\text{-}E_1}{A \wedge B \vdash B \wedge A}\wedge\text{-}I$$

$$\frac{A \wedge B \vdash B \wedge A}{\vdash A \wedge B \to B \wedge A}\to_I{}^{\alpha}$$

$$A \vee \bot \to A$$

$$\dfrac{\dfrac{}{A\vee\bot \vdash A\vee\bot}\alpha \qquad \dfrac{\dfrac{}{A\vee\bot, A \vdash A}\beta_1 \qquad \dfrac{\dfrac{}{A\vee\bot, \bot \vdash A}\bot_{-E}}{A\vee\bot, \bot\vdash A}\vee_{-E}\,\beta_1,\beta_2}{A\vee\bot \vdash A}\,i}{\vdash (A\vee\bot)\to A}\to_I{}^{\alpha}$$

$$A, A \to \bot \vdash \bot$$

$$A \vdash \top \to (\top \to A)$$

$$(\top \to (\top \to A)) \vdash A$$

$$A \to (\top \to (\top \to A))$$

$$(\top \to (\top \to A)) \to A$$

$$A \to \neg\neg A$$

$$\neg\neg A \to A$$

```
data Switch = On Int Name
            | Off Name
```

(Int x Name) + Name

a

= (Name x Int) + (Name x ())

= (Name x (Int + ()))

```
data Maybe a = Just a      a
             | Nothing   + ()
```

(Name x Maybe Int) = (Name x (Int + ()))