

Mode-Correctness of Bidirectional Typing

In checking mode, the information flow starts from the conclusion

$$\frac{\Gamma, x : \text{Int} \vdash t : \leftarrow \text{Bool}}{\Gamma \vdash \lambda x. t : \leftarrow \text{Int} \supset \text{Bool}} \text{ABS}^{\leftarrow}$$

$$\frac{\Gamma \vdash t : \Rightarrow A \supset B \quad \Gamma \vdash u : \leftarrow A}{\Gamma \vdash t u : \Rightarrow B} \text{APP}^{\Rightarrow}$$

Mode-Correctness of Bidirectional Typing

In synthesis mode, the information flow starts from the first premise

$$\frac{\Gamma, x : A \vdash t : \leftarrow B}{\Gamma \vdash \lambda x. t : \leftarrow A \supset B} \text{ABS} \leftarrow \quad \frac{\Gamma \vdash t : \Rightarrow \quad \Gamma \vdash u : \leftarrow}{\Gamma \vdash t u : \Rightarrow} \text{APP} \Rightarrow$$