

Mode-Correctness of Bidirectional Typing

The type information flows without blocking

$$\frac{\Gamma, x : A \vdash t : \Leftarrow B}{\Gamma \vdash \lambda x. t : \Leftarrow A \supset B} \text{A}_{\text{BS}}^{\Leftarrow}$$

$$\frac{\Gamma \vdash t : \Rightarrow A \supset B \quad \Gamma \vdash u : \Leftarrow A}{\Gamma \vdash t u : \Rightarrow B} \text{A}_{\text{PP}}^{\Rightarrow}$$

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In checking mode, the information flow starts from the conclusion

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

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