

Summary of Mini-Haskell Typing Rules

$$\begin{array}{c}
 \frac{}{\dots, x : \tau, \dots \vdash x :: \tau} \text{Var} \\
 \frac{\Gamma, x : \sigma \vdash t :: \tau}{\Gamma \vdash \lambda x. t :: \sigma \rightarrow \tau} \text{Abs} \\
 \\
 \frac{\Gamma \vdash t_1 :: \sigma \rightarrow \tau \quad \Gamma \vdash t_2 :: \sigma}{\Gamma \vdash t_1 t_2 :: \tau} \text{App} \\
 \\
 \frac{\Gamma \vdash t :: \text{Int}}{\Gamma \vdash \mathbf{iszero} t :: \text{Bool}} \text{iszero} \\
 \\
 \frac{}{\Gamma \vdash n :: \text{Int}} \text{Int} \quad \frac{}{\Gamma \vdash \text{True} :: \text{Bool}} \text{True} \quad \frac{}{\Gamma \vdash \text{False} :: \text{Bool}} \text{False} \\
 \\
 \frac{\Gamma \vdash t_1 :: \text{Int} \quad \Gamma \vdash t_2 :: \text{Int}}{\Gamma \vdash (t_1 \mathbf{op} t_2) :: \text{Int}} \text{BinOp} \quad \text{for } \mathbf{op} \in \{+, *\} \\
 \\
 \frac{\Gamma \vdash t_0 :: \text{Bool} \quad \Gamma \vdash t_1 :: \tau \quad \Gamma \vdash t_2 :: \tau}{\Gamma \vdash \mathbf{if} t_0 \mathbf{then} t_1 \mathbf{else} t_2 :: \tau} \text{if} \\
 \\
 \frac{\Gamma \vdash t_1 :: \tau_1 \quad \Gamma \vdash t_2 :: \tau_2}{\Gamma \vdash (t_1, t_2) :: (\tau_1, \tau_2)} \text{Tuple} \quad \frac{\Gamma \vdash t :: (\tau_1, \tau_2)}{\Gamma \vdash \mathbf{fst} t :: \tau_1} \text{fst} \quad \frac{\Gamma \vdash t :: (\tau_1, \tau_2)}{\Gamma \vdash \mathbf{snd} t :: \tau_2} \text{snd}
 \end{array}$$