

LAMBDA

MODULE LAMBDA

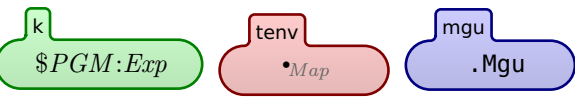
SYNTAX $Exp ::= Int$
| $Bool$
| Id
| (Exp) [bracket]
| $Exp\ Exp$ [strict]
| $Exp * Exp$ [strict]
| Exp / Exp [strict]
| $Exp + Exp$ [strict]
| $Exp <= Exp$ [strict]
| $\text{lambda } Id . Exp$
| $\text{if } Exp \text{ then } Exp \text{ else } Exp$ [strict]
| $\text{let } Id = Exp \text{ in } Exp$
| $\text{letrec } Id\ Id = Exp \text{ in } Exp$
| $\text{mu } Id . Exp$

SYNTAX $Type ::= \text{int}$
| bool
| $Type \rightarrow Type$
| $(Type)$ [bracket]

SYNTAX $Exp ::= Type$

SYNTAX $KResult ::= Type$

CONFIGURATION:



RULE $\frac{I:Int}{\text{int}}$

RULE $\frac{B:Bool}{\text{bool}}$

RULE $\frac{\frac{X:Id}{T}}{T}$ $X \mapsto T$

RULE $\frac{T1:Type * T2:Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE $\frac{T1:Type / T2:Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE $\frac{T1:Type + T2:Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{int}}$

RULE $\frac{T1:Type <= T2:Type}{T1 = \text{int} \curvearrowright T2 = \text{int} \curvearrowright \text{bool}}$

SYNTAX $Exp ::= Exp \rightarrow Exp$ [strict]

RULE $\frac{\frac{\text{lambda } X:Id . E}{T \rightarrow E \curvearrowright \text{tenv}(TEnv)}}{\frac{TEnv}{TEnv[T / X]}}$ requires fresh $(T:Type)$

RULE $\frac{T1:Type\ T2:Type}{T1 = (T2 \rightarrow T) \curvearrowright T}$ requires fresh $(T:Type)$

RULE $\frac{\text{if } T:Type \text{ then } T1:Type \text{ else } T2:Type}{T = \text{bool} \curvearrowright T1 = T2 \curvearrowright T1}$

RULE $\frac{\text{let } X = E \text{ in } E'}{(\text{lambda } X . E')\ E}$ [macro]

RULE $\frac{\text{letrec } F\ X = E \text{ in } E'}{\text{let } F = \text{mu } F . \text{lambda } X . E \text{ in } E'}$ [macro]

RULE $\frac{\frac{\text{mu } X:Id . E:Exp}{(T \rightarrow T)\ E \curvearrowright \text{tenv}(TEnv)}}{\frac{TEnv}{TEnv[T / X]}}$ requires fresh $(T:Type)$

SYNTAX $K ::= Type = Type$

RULE $\frac{\frac{T = T'}{\bullet_K}}{\frac{\theta:Mgu}{\text{updateMgu}(\theta, T, T')}}}$

RULE $\frac{\frac{T:Type}{\theta(T)}}{\bullet_K}$ $\frac{\theta:Mgu}{\bullet_K}$

SYNTAX $K ::= \text{tenv}(Map)$

RULE $\frac{\frac{T:Type \curvearrowright \text{tenv}(TEnv)}{\bullet_K}}{\frac{}{TEnv}}$

END MODULE