Universidade Federal do Rio Grande do Sul INF05516 - Semântica Formal - Turma U - Trabalho Final

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1 Sistema de Tipos

$$\frac{\Gamma e : T}{\Gamma e :: nil : TList} \qquad \frac{\Gamma e1 : T,\ \Gamma\ e2 : TList}{\Gamma e1 :: e2\ :\ TList} \qquad \frac{\Gamma e : TList}{\Gamma isempty\ e : bool}$$

$$\frac{\Gamma e : TList}{\Gamma hd\ e : T} \qquad \frac{\Gamma e : TList}{\Gamma tl\ e : TList} \qquad \frac{}{\Gamma\ \text{nothing: Maybe T}} \qquad \frac{\Gamma\ e : T}{\Gamma\ \text{just e: Maybe T}}$$

$$\frac{\Gamma\ e1 : TList\ \Gamma\ x : T\ \Gamma\ xs : TList\ \Gamma\ e2 : T`\ \Gamma\ e3 : T`}{\Gamma\ \text{match e1 with | nil}\ \rightarrow\ \text{e2 | x::xs}\ \rightarrow\ \text{e3}\ : T`}$$

$$\frac{\Gamma\ e1 : MaybeT\ \Gamma\ x : T\ \Gamma\ e2 : T`\ \Gamma\ e3 : T`}{\Gamma\ \text{match e1 with | nothing}\ \rightarrow\ \text{e2 | just x}\ \rightarrow\ \text{e3}\ : T`}$$

2 Semântica Operacional Big-step

$$\frac{}{nil \Downarrow nil} \qquad \frac{e1 \Downarrow v1}{e1 :: e2 \Downarrow v1 :: e2} \qquad \frac{e2 \Downarrow v2}{v1 :: e2 \Downarrow v1 :: v2}$$

$$\frac{e1 \Downarrow nil}{isempty\ e1 \Downarrow true} \qquad \frac{e1 \Downarrow v :: vs}{isempty\ e1 \Downarrow false} \qquad \frac{e1 \Downarrow v :: vs}{hd\ e1 \Downarrow v} \qquad \frac{e1 \Downarrow v :: vs}{tl\ e1 \Downarrow vs}$$

$$\frac{e1 \Downarrow nil}{\text{match e1 with | nil}\ \rightarrow\ \text{e2 | x::xs}\ \rightarrow\ \text{e3} \Downarrow e2}$$

$$\frac{e1 \Downarrow v :: vs}{\text{match e1 with } | \text{ nil } \rightarrow \text{ e2 } | \text{ x::xs } \rightarrow \text{ e3} \Downarrow e3}$$

$$\frac{}{nothing \Downarrow nothing} \quad \frac{e \Downarrow v}{just\ e \Downarrow just\ v}$$

$$\frac{e1 \Downarrow nothing}{\text{match e1 with } | \text{ nothing } \rightarrow \text{ e2 } | \text{ just x} \rightarrow \text{ e3} \Downarrow e2}$$

$$\frac{e1 \Downarrow just\ v}{\text{match e1 with } | \text{ nothing} \rightarrow \text{e2 } | \text{ just x } \rightarrow \text{ e3} \Downarrow e3}$$