

# Trabalho final - Semântica formal N

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## 1 Semântica operacional big step com ambientes

$$\begin{array}{c}
\frac{\rho \vdash e_1 \Downarrow v_1}{\rho \vdash \text{just } e_1 \Downarrow v_1} \\
\frac{\rho \vdash e_1 \Downarrow \text{none} \quad \rho \vdash e_2 \Downarrow v_1}{\rho \vdash \text{match } e_1 \text{ with nothing } \rightarrow e_2 \mid \text{just } x \rightarrow e_3 \Downarrow v_1} \\
\frac{\rho \vdash e_1 \Downarrow \text{just } v_1 \quad \rho, [x \mapsto v_1] \vdash e_3 \Downarrow v_1}{\rho \vdash \text{match } e_1 \text{ with nothing } \rightarrow e_2 \mid \text{just } x \rightarrow e_3 \Downarrow v_1}
\end{array}$$

$$\begin{array}{c}
\frac{\rho \vdash e_1 \Downarrow v_1 \quad \rho \vdash e_2 \Downarrow v_2}{\rho \vdash e_1 :: e_2 \Downarrow v_1 :: v_2} \\
\frac{\rho \vdash e_1 \Downarrow \text{nil} \quad \rho \vdash e_2 \Downarrow v_1}{\rho \vdash \text{match } e_1 \text{ with nil } \rightarrow e_2 \mid x :: xs \rightarrow e_3 \Downarrow v_1} \\
\frac{\rho \vdash e_1 \Downarrow v_1 :: v_2 \quad \rho, [x \mapsto v_1, xs \mapsto v_2] \vdash e_3 \Downarrow v_3}{\rho \vdash \text{match } e_1 \text{ with nil } \rightarrow e_2 \mid x :: xs \rightarrow e_3 \Downarrow v_3}
\end{array}$$

$$\begin{array}{c}
\frac{\rho \vdash e_1 \Downarrow v_1 \quad \rho \vdash e_2 \Downarrow v_2}{\rho \vdash e_1 \mid > e_2 \Downarrow v_1 \mid > v_2} \\
\frac{\rho \vdash e_1 \Downarrow v_1 \quad \rho \vdash e_2 \Downarrow \{x, e_3, \rho_1\} \quad \rho_1, [x \mapsto v_1] \vdash e_3 \Downarrow v_2}{\rho \vdash e_1 \mid > e_2 \Downarrow v_2} \\
\frac{\rho \vdash e_1 \Downarrow v_1 \quad \rho \vdash e_2 \Downarrow \{f, x, e_3, \rho_1\} \quad \rho_1, [x \mapsto v_1, f \mapsto \{f, x, e_3, \rho_1\}] \vdash e_3 \Downarrow v_2}{\rho \vdash e_1 \mid > e_2 \Downarrow v_2}
\end{array}$$