Progetto Compilatori

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Indice

1 Regole di Type Checking implementate

1.1 Tipi Primitivi

$$\Gamma \vdash null : null \qquad \Gamma \vdash true : boolean \qquad \Gamma \vdash false : boolean$$

$$\Gamma \vdash int : int \qquad \Gamma \vdash float : float \qquad \Gamma \vdash string : string \qquad \Gamma \vdash bool : boolean$$

1.2 Dichiarazioni di Variabili

$$\frac{(x : \tau) \in \Gamma}{\Gamma \vdash x : \tau}$$

1.3 Operazioni Unarie

$$\frac{\Gamma \vdash e : \tau_1 \quad optype1(op, \tau_1) = \tau}{\Gamma \vdash (op\ e) : \tau}$$

1.4 Operazioni Binarie

$$\frac{\Gamma \vdash e_1 : \tau_1 \quad \Gamma \vdash e_2 : \tau_2 \quad optype2(op, \tau_1, \tau_2) = \tau}{\Gamma \vdash (e_1\ op\ e_2) : \tau}$$

1.5 Chiamata a Procedura

$$\frac{\Gamma \vdash f : \tau_i^{\,i \in 1 \dots n} \to \tau_j^{\,j \in 1 \dots m} \quad \Gamma \vdash e_i : \tau_i^{\,i \in 1 \dots n}}{\Gamma \vdash f(e_i^{\,i \in 1 \dots n}) : \tau_j^{\,j \in 1 \dots m}}$$

1.6 Statement

1.6.1 if-then

$$\frac{\Gamma \vdash e : boolean \quad \Gamma \vdash stmt}{\Gamma \vdash \texttt{if}\ e\ \texttt{then}\ stmt\ \texttt{fi}}$$

1.6.2 if-then-else

$$\frac{\Gamma \vdash e : boolean \quad \Gamma \vdash stmt_1 \quad \Gamma \vdash stmt_2}{\Gamma \vdash \texttt{if}\ e\ \texttt{then}\ stmt_1\ \texttt{else}\ stmt_2\ \texttt{fi}}$$

1.6.3 if-then-elif-else

$$\frac{\Gamma \vdash e_j^{\,j \in 1 \dots m} : boolean \quad \Gamma \vdash stmt_i^{\,i \in 1 \dots 3}}{\Gamma \vdash \texttt{if}\ e_1\ \texttt{then}\ stmt_1\ (\texttt{elif}\ e_j^{\,j \in 2 \dots m}\ \texttt{then}\ stmt_2\ )_t^{\,t \in 1 \dots k}\ \texttt{else}\ stmt_3\ \texttt{fi}}$$

1.6.4 while

$$\frac{\Gamma \vdash e : boolean \quad \Gamma \vdash stmt}{\Gamma \vdash \texttt{while}\ e\ \texttt{do}\ stmt\ \texttt{od}}$$

1.6.5 while-return

$$\frac{\Gamma \vdash e\colon \mathit{boolean} \quad \Gamma \vdash \mathit{stmt}_1 \quad \Gamma \vdash \mathit{stmt}_2}{\Gamma \vdash \texttt{while}\ \mathit{stmt}_1 \texttt{->}\ e\ \texttt{do}\ \mathit{stmt}_2\ \texttt{od}}$$

1.6.6 readln

$$\frac{(x_i^{\,i\in 1\ldots n}\colon \tau_i^{\,i\in 1\ldots n}) \in \Gamma}{\Gamma \vdash \texttt{readln}(x_i^{\,i\in 1\ldots n})}$$

1.6.7 write

$$\frac{\Gamma \vdash e\colon \tau}{\Gamma \vdash \texttt{write}(e\colon \tau)}$$

1.6.8 assign

$$\frac{(x\colon \tau) \in \Gamma \quad \Gamma \vdash e\colon \tau}{\Gamma \vdash x := e}$$