Progetto Compilatori
A.A. 2020/2021

Gaetano Antonucci   Alessio Romano

18 gennaio 2021

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

$$\frac{\Gamma \vdash e{:}boolean \quad \Gamma \vdash stmt_1 \quad \Gamma \vdash stmt_2}{\Gamma \vdash \texttt{while } stmt_1 {\to} e \texttt{ do } stmt_2 \texttt{ od}}$$

1.6.6 readln

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