

Progetto Compilatori

A.A. 2020/2021

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18 gennaio 2021

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1 Regole di Type Checking implementate

1.1 Tipi Primitivi

$$\begin{array}{l} \Gamma \vdash \text{null}:\text{null} \quad \Gamma \vdash \text{true}:\text{boolean} \quad \Gamma \vdash \text{false}:\text{boolean} \\ \Gamma \vdash \text{int}:\text{int} \quad \Gamma \vdash \text{float}:\text{float} \quad \Gamma \vdash \text{string}:\text{string} \quad \Gamma \vdash \text{bool}:\text{boolean} \end{array}$$

1.2 Dichiarazioni di Variabili

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

1.3 Operazioni Unarie

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

1.4 Operazioni Binarie

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

1.5 Chiamata a Procedura

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

1.6 Statement

1.6.1 if-then

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

1.6.2 if-then-else

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

1.6.3 if-then-elif-else

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

1.6.4 while

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

1.6.5 while-return

$$\frac{\Gamma \vdash e:\textit{boolean} \quad \Gamma \vdash \textit{stmt}_1 \quad \Gamma \vdash \textit{stmt}_2}{\Gamma \vdash \textbf{while } \textit{stmt}_1 \rightarrow e \textbf{ do } \textit{stmt}_2 \textbf{ od}}$$

1.6.6 readln

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