

Script generated by TTT

Title: Petter: Compiler Construction (25.06.2020)
- 46: Type Checking Example

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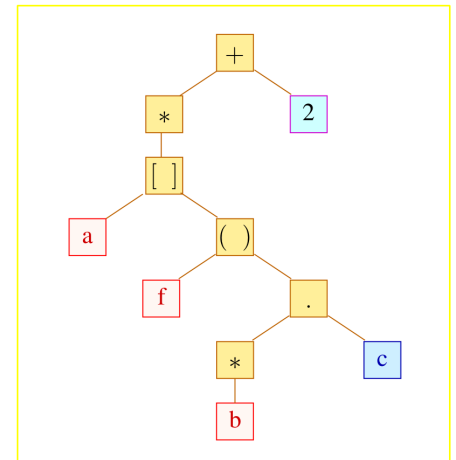
Example: Type Checking

Given expression `*a[f(b->c)]+2` and

```

Γ = {
  struct list { int info; struct list* next; };
  int f(struct list* l);
  struct { struct list* c; } * b;
  int* a[11];
}

```



Example: Type Checking – More formally:

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$$\text{OP} \frac{\text{DEREF} \frac{\Gamma \vdash a[f(b \rightarrow c)] : t}{\Gamma \vdash *a[f(b \rightarrow c)] : t} \quad \text{CONST} \frac{\Gamma \vdash 2 : t}}{\Gamma \vdash *a[f(b \rightarrow c)] + 2 : t}$$

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$$\text{ARRAY} \frac{\text{VAR} \frac{\Gamma \vdash a : t}{} \quad \text{APP} \frac{\text{VAR} \frac{\Gamma \vdash f : _ (t)}{} \quad \Gamma \vdash (*b).c : t}{\Gamma \vdash f(b \rightarrow c) : \text{int}}}{\Gamma \vdash a[f(b \rightarrow c)] : t}$$

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 \text{VAR } \frac{}{\Gamma \vdash b:} \\
 \text{DEREF } \frac{}{\Gamma \vdash *b:} \\
 \text{STRUCT } \frac{}{\Gamma \vdash (*b).c:} \\
 \\
 \text{VAR } \frac{}{\Gamma \vdash a:} \quad \text{APP } \frac{\text{VAR } \frac{}{\Gamma \vdash f: _ (t)} \quad \Gamma \vdash (*b).c: t}{\Gamma \vdash f(b \rightarrow c): \text{int}}}{\Gamma \vdash a[f(b \rightarrow c)]:} \\
 \\
 \text{DEREF } \frac{\Gamma \vdash a[f(b \rightarrow c)]:}{\Gamma \vdash *a[f(b \rightarrow c)]: t} \quad \text{CONST } \frac{}{\Gamma \vdash 2: t} \\
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52/67

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 \text{DEREF } \frac{}{\Gamma \vdash *b:} \\
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 \text{VAR } \frac{}{\Gamma \vdash a:} \quad \text{APP } \frac{\text{VAR } \frac{}{\Gamma \vdash f: _ (t)} \quad \Gamma \vdash (*b).c: t}{\Gamma \vdash f(b \rightarrow c): \text{int}}}{\Gamma \vdash a[f(b \rightarrow c)]:} \\
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 \text{VAR } \frac{}{\Gamma \vdash a : \text{int}*[11]} \quad \text{APP } \frac{\text{VAR } \frac{}{\Gamma \vdash f : \text{int}(\text{struct list}*)} \quad \Gamma \vdash (*b).c : \text{struct list}*}{\Gamma \vdash f(b \rightarrow c) : \text{int}}} \\
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but what do we do with \leq ?