

Lecture 13: Encodings of Lists, Structs, and Variants

EN.601.426/626 Principles of Programming Languages – SP26

Name: _____

Assume we have the language $F\flat T$, which supports binary-tuples (e.g., $(1, 2)$) and labels (e.g., `'label`) as first-class language constructs. We use the following rewrite-rules to define `CONS` and `NIL` for lists:

$$\begin{aligned}\text{CONS}(\text{hd}, \text{tl}) &\equiv_{\delta} (\text{'Cons}, (\text{hd}, \text{tl})) \\ \text{NIL} &\equiv_{\delta} \text{'Nil}\end{aligned}$$

Lists of the form $[e_1; e_2; \dots; e_n]$ are represented as

$$\text{CONS}(e_1, \text{CONS}(e_2, \dots \text{CONS}(e_n, \text{NIL}) \dots))$$

Desugar the following list into $F\flat T$:

`[[1; 2]; [3; 4]]`

Structs of the form $\{l_1 = e_1; l_2 = e_2; \dots\}$ are encoded as tuple of the form:

$$(\text{'struct}, [(l_1, e_1), (l_2, e_2), \dots])$$

Please desugar the following struct into $F\flat T$:

`{len = 2; content = [1; 2]}`