Programming paradigms 1

Detailed evaluation of the 2nd exam, version b.

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Outline

(if (+) + -)

$\mathsf{Eval}[(\texttt{if}\ (\texttt{+})\ \texttt{+}\ \texttt{-}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$$\text{Eval}[(\texttt{if}\ (\texttt{+})\ \texttt{+}\ \texttt{-}), \mathcal{P}_{\mathrm{G}}] = \ldots$$

$$\text{Eval}[\texttt{if}, \mathcal{P}_{\mathrm{G}}] = \text{'special form if'}$$

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$\quad \text{Apply}[\text{'pr. proc. of sum.'}] = 0$

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$\quad \text{Apply}[\text{'pr. proc. of sum.'}] = 0$

$\quad 0 \neq \text{'\#f'}$

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$\quad \text{Eval}[\texttt{+}, \mathcal{P}_{\mathrm{G}}] = \text{'pr. proc. of sum.'}$

Outline

((define x 0) x)

$\mathsf{Eval}[((\texttt{define x 0})\ \texttt{x}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\quad\quad \checkmark\ \texttt{x}$ is a symbol.

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$\text{Eval}[((\texttt{define x 0})\ \texttt{x}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\mathsf{Eval}[((\texttt{define x 0})\ \texttt{x}), \mathcal{P}_{\mathrm{G}}] = \ldots$

$\mathsf{Eval}[(\texttt{define x 0}), \mathcal{P}_{\mathrm{G}}] = \ldots$

$\mathsf{Eval}[\texttt{define}, \mathcal{P}_{\mathrm{G}}] =$ 'special form define'

$\mathsf{Apply}_{\mathcal{P}_{\mathrm{G}}}[$'special form define', $\texttt{x}, 0] = \ldots$

✓ $\texttt{x}$ is a symbol.

$\mathsf{Eval}[0, \mathcal{P}_{\mathrm{G}}] = 0$

$\texttt{x} \mapsto_{\mathcal{P}_{\mathrm{G}}} 0$

((define x 0) x)

$\text{Eval}[((\texttt{define x 0})\ \texttt{x}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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✓ $\texttt{x}$ is a symbol.

$\text{Eval}[0, \mathcal{P}_{\mathrm{G}}] = 0$

$\texttt{x} \mapsto_{\mathcal{P}_{\mathrm{G}}} 0$

$=$ 'undefined'

((define x 0) x)

$\text{Eval}[((\texttt{define x 0})\ \texttt{x}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\quad\quad \text{Eval}[\texttt{define}, \mathcal{P}_{\mathrm{G}}] = \text{'special form define'}$

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$\quad\quad \checkmark\ \texttt{x}$ is a symbol.

$\quad\quad \text{Eval}[0, \mathcal{P}_{\mathrm{G}}] = 0$

$\quad\quad \texttt{x} \mapsto_{\mathcal{P}_{\mathrm{G}}} 0$

$\quad\quad = \text{'undefined'}$

Error: The first element did not evaluate to proc. or spec. form.

Outline

if

$\mathsf{Eval}[\texttt{if}, \mathcal{P}_{\mathrm{G}}] =$ 'special form if'

Outline

(+ (if + 0 1))

$\mathsf{Eval}[(\texttt{+}\ (\texttt{if}\ \texttt{+}\ \texttt{0}\ \texttt{1})), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$$\text{Eval}[(\texttt{+}\ (\texttt{if}\ \texttt{+}\ \texttt{0}\ \texttt{1})), \mathcal{P}_{\mathrm{G}}] = \ldots$$

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$\mathsf{Eval}[(\texttt{+ (if + 0 1)}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\qquad \text{'pr. proc. of sum.'} \neq \text{'\#f'}$

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$\qquad \text{Eval}[\texttt{0}, \mathcal{P}_{\mathrm{G}}] = \texttt{0}$

$\text{Apply}[\text{'pr. proc. of sum.'}, \texttt{0}] = \texttt{0}$

Outline

(if if define)

$\mathsf{Eval}[(\texttt{if if define}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\quad$ 'special form if' $\neq$ '#f'

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$\text{Apply}_{\mathcal{P}_{\mathrm{G}}}[\text{'special form if'}, \texttt{if}, \texttt{define}] = \ldots$

$\quad \text{Eval}[\texttt{if}, \mathcal{P}_{\mathrm{G}}] = \text{'special form if'}$

$\quad \text{'special form if'} \neq \text{'\#f'}$

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Outline

(define 0 1)

$\mathsf{Eval}[(\texttt{define}\ \texttt{0}\ \texttt{1}), \mathcal{P}_{\mathrm{G}}] = \ldots$

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$\quad$ **Error:** define: '0' is not a symbol.