Here's some shitty-first draft bad opsem. My goal for today is to make good opsem.

My questions are:

Do we want opsem to formally notate the evaluation of e with the new bindings?

I'm putting the verse rules on top to represent how they create no bindings as well. How kosher is this?

I assume we need to prove Verse-if true e e is e and creates no new bindings to logical variables in its scope. Am I right about this?

Introduce an abstract machine semantics? uscheme in chapter 3.

First, talk about syntactic forms and forms of judgement.

1 for verse, one for PM.

Forms of judgement

First, the base translation:

Translation from P to V-style if-then-else:

case `v` *of* $\_ \to e$
$\triangleq$
`if (True) e e`

TODO FIX if true e e to if true e impossible

$$\textsc{Verse-IfTrueBindings}\ \frac{}{\textsc{Verse-If}(\texttt{True}\ e\ e) \rightarrowtail \{\}}$$

$$\textsc{Verse-IfTrueEval}\ \frac{}{\textsc{Verse-If}(\texttt{True}\ e\ e) \rightarrowtail e}$$

Maybe want these as Verse-IfLiteralBindings?

$$\textsc{TranslateWildcardBindings}\ \frac{\textsc{Verse-If}(\texttt{True}\ e\ e) \rightarrowtail \{\}}{\textsc{case}(\textsc{Wildcard}, v) \rightarrowtail \{\}}$$

$$\textsc{TranslateWildcardEval}\ \frac{}{\textsc{case}(\textsc{Wildcard}, v, e) \rightarrowtail \textsc{Verse-If}(\texttt{True}\ e\ e)}$$

$$\textsc{TranslateWildcardEval'}\ \frac{\textsc{Verse-If}(\texttt{True}\ e\ e) \rightarrowtail e}{\textsc{case}(\textsc{Wildcard}, v, e) \rightarrowtail e}$$

Moving on to variables:

case `v` *of* $x \rightarrow e$
$\triangleq$
`if (`$\exists x.\ x = v$`) e e`

$$\textsc{Verse-IfBindings}\ \frac{}{\textsc{Verse-If}(\texttt{(}\exists x.\ x = v\texttt{)} e\ e) \rightarrowtail e\{x \longmapsto v\}}$$

$$\textsc{Verse-IfEval}\ \frac{}{\textsc{Verse-If}(\texttt{True}\ e\ e) \rightarrowtail e}$$

$$\textsc{TranslateVarBindings}\ \frac{\textsc{Verse-If}(\texttt{(}\exists x.\ x = v\texttt{)}\ e\ e) \rightarrowtail \{x \longmapsto v\}}{\textsc{case}(x, v, e) \rightarrowtail \{x \longmapsto v\}}$$

$$\textsc{TranslateVarEval}\ \frac{\textsc{Verse-If}(\texttt{(}\exists x.\ x = v\texttt{)}\ e\ e) \rightarrowtail e\{x \longmapsto v\}}{\textsc{case}(x, v, e) \rightarrowtail e\{x \longmapsto v\}}$$