Manual calculation of probability for query `?- prob(lohmm([emacs(f1), 'STOP'])` with 0.0202478 probability computed by the PRISM system.

Formal LOHMM rules are given with parameters as set in `lohmm.psm` where the grounding probabilities μ are set to 0.5 by default.

1 Explanation Calculations

Since all proofs will begin with `start` $\rightarrow$ `emacs(F, U)` followed by grounding to the form `emacs(f1, U)` and given the fact that all proofs will end with a .1 probability transition to `stop`, we have probability $.45 \times .5 \times .1 = .0225$ which can be pulled out of the subsequent summation.

Additionally there is a probability of .5 to ground `U` to either `tex` or `other`, this can also be removed from the summation giving a total of .01125 factored out.

1.1 emacs(f1, tex)

$P($`emacs(f1, tex)` $\rightarrow$ `ls(U)`$) = .2666$
$P($`emacs(f1, tex)` $\rightarrow$ `emacs(F, U)`$) = .0666$
$P($`emacs(f1, tex)` $\rightarrow$ `latex(F, U)`$) = .5666$

1.2 emacs(f1, other)

$P($`emacs(f1, other)` $\rightarrow$ `ls(U)`$) = .65$
$P($`emacs(f1, other)` $\rightarrow$ `emacs(F, U)`$) = .25$

1.3 Total Probability

$.01125 \times (.2666 + .0666 + .5666 + .65 + .25) = .02024775$ which is the same as the answer returned by PRISM.

2 Υ

$0.55 :$ `emacs(F, U)` $\overset{\emptyset}{\leftarrow}$ `start`
$0.45 :$ `ls(U)` $\overset{\emptyset}{\leftarrow}$ `start`

3 Δ

3.1 emacs(F, U)

$0.65 : \texttt{ls(U}') \xleftarrow{\texttt{emacs(F)}} \texttt{emacs(F, U)}$
$0.25 : \texttt{emacs(F}', \texttt{ U)} \xleftarrow{\texttt{emacs(F)}} \texttt{emacs(F, U)}$
$0.1 : \texttt{stop} \xleftarrow{\texttt{STOP}} \texttt{emacs(F, U)}$

3.2 emacs(F, tex)

$0.5666 : \texttt{latex(F, tex)} \xleftarrow{\texttt{emacs(F)}} \texttt{emacs(F, tex)}$
$0.2666 : \texttt{ls(U}') \xleftarrow{\texttt{emacs(F)}} \texttt{emacs(F, tex)}$
$0.0666 : \texttt{emacs(F}', \texttt{ U)} \xleftarrow{\texttt{emacs(F)}} \texttt{emacs(F, tex)}$
$0.1 : \texttt{stop} \xleftarrow{\texttt{STOP}} \texttt{emacs(F, U)}$

3.3 ls(U)

$0.35 : \texttt{ls(U)} \xleftarrow{\texttt{ls}} \texttt{ls(U)}$
$0.55 : \texttt{emacs(F, U}') \xleftarrow{\texttt{ls}} \texttt{ls(U)}$
$0.1 : \texttt{stop} \xleftarrow{\texttt{STOP}} \texttt{emacs(F, U)}$

3.4 latex(F, U)

$0.1666 : \texttt{ls(U}') \xleftarrow{\texttt{latex(F)}} \texttt{latex(F, tex)}$
$0.1666 : \texttt{emacs(F, tex)} \xleftarrow{\texttt{latex(F)}} \texttt{latex(F, tex)}$
$0.5666 : \texttt{emacs(F}', \texttt{ U)} \xleftarrow{\texttt{latex(F)}} \texttt{latex(F, tex)}$
$0.1 : \texttt{stop} \xleftarrow{\texttt{STOP}} \texttt{emacs(F, U)}$