IMP

MODULE IMP-SYNTAX

SYNTAX *AExp* ::= *Int*
| *String*
| *Id*
| `++` *Id*
| `read` ()
| *AExp* `/` *AExp* [strict, division]
| *AExp* `+` *AExp* [strict]
| (*AExp*) [bracket]

SYNTAX *BExp* ::= *Bool*
| *AExp* ≤ *AExp* [seqstrict]
| `!` *BExp* [strict]
| *BExp* && *BExp* [strict(1)]
| (*BExp*) [bracket]

SYNTAX *Block* ::= {}
| {*Stmt*}

SYNTAX *Stmt* ::= *Block*
| *Id* `=` *AExp* `;` [strict(2)]
| `if` (*BExp*)*Block* `else` *Block* [strict(1)]
| `while` (*BExp*)*Block*
| `int` *Ids* `;`
| `print` (*AExps*) `;` [strict]
| `halt` `;`
| `spawn` *Stmt*
| *Stmt* *Stmt*

SYNTAX *Ids* ::= *List*{*Id*, ","} [strict]

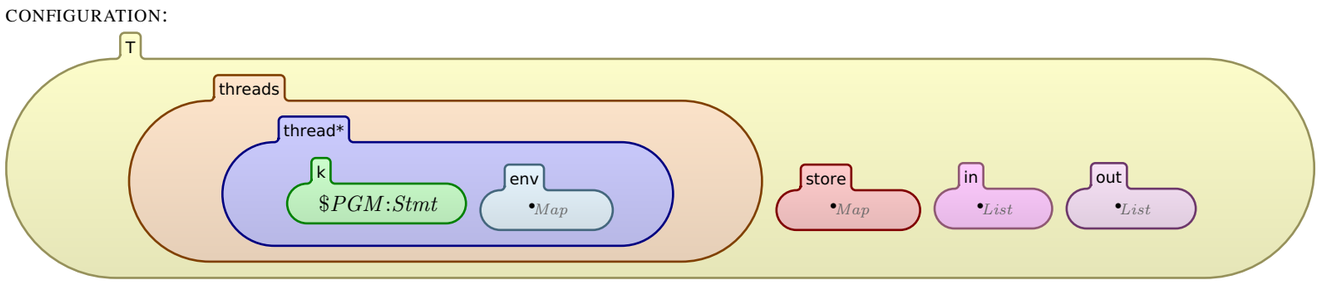
SYNTAX *AExps* ::= *List*{*AExp*, ","} [strict]

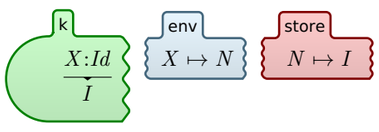
END MODULE

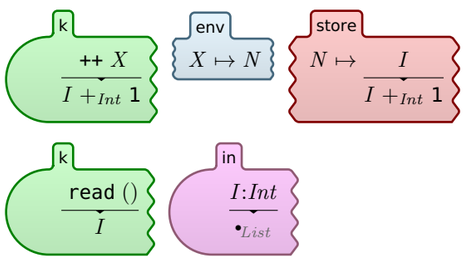
MODULE IMP

SYNTAX *KResult* ::= *Int*
| *Bool*
| *String*

CONFIGURATION:



RULE  [lookup]

RULE  [increment]

RULE [read]

RULE $\frac{I1{:}Int \texttt{ / } I2{:}Int}{I1 \div_{Int} I2}$ requires $I2 =/=_{Int} 0$

RULE $\frac{I1{:}Int \texttt{ + } I2{:}Int}{I1 +_{Int} I2}$

RULE $\frac{Str1{:}String \texttt{ + } Str2{:}String}{Str1 +_{String} Str2}$

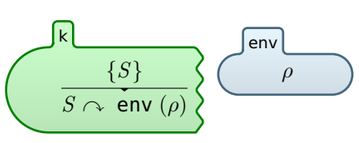
RULE $\frac{I1{:}Int \leq I2{:}Int}{I1 \leq_{Int} I2}$

RULE $\frac{\texttt{!}\ T{:}Bool}{\neg_{Bool} T}$

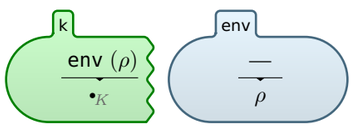
RULE $\frac{\texttt{true \&\&}\ B}{B}$

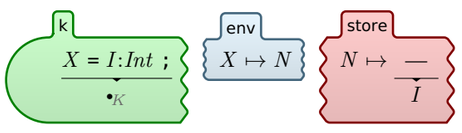
RULE $\frac{\texttt{false \&\&}\ \_\_}{\texttt{false}}$

RULE $\frac{\{\}}{\bullet_K}$ [structural]

RULE  [structural]

SYNTAX *K* ::= `env` (*Map*)

RULE  [structural]

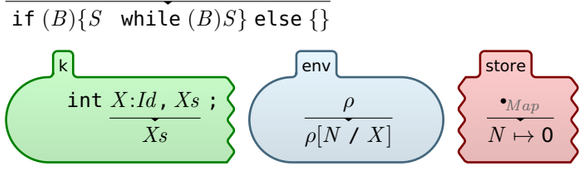
RULE  [assignment]

RULE $\frac{S1 \quad S2}{S1 \curvearrowright S2}$ [structural]

RULE $\frac{\texttt{if (true)}S \texttt{ else } \_\_}{S}$

RULE $\frac{\texttt{if (false)}\_\_ \texttt{ else } S}{S}$

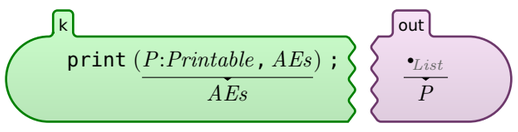
RULE $\frac{\texttt{while } (B)S}{\texttt{if } (B)\{S \quad \texttt{while } (B)S\} \texttt{ else } \{\}}$ [structural]

RULE  requires `fresh` (*N*:*Nat*) [structural]

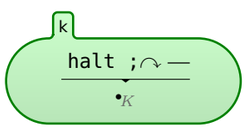
RULE $\frac{\texttt{int } \bullet_{Ids} \texttt{ ;}}{\bullet_K}$ [structural]

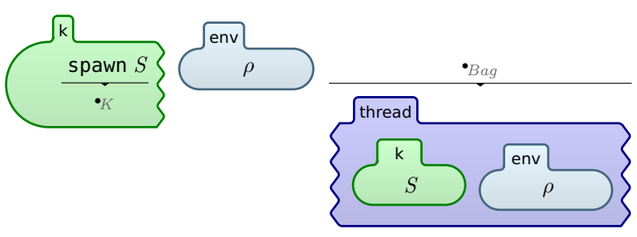
SYNTAX *Printable* ::= *Int*
| *String*

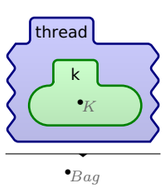
SYNTAX *AExp* ::= *Printable*

RULE  [print]

RULE $\frac{\texttt{print } (\bullet_{AExps}) \texttt{ ;}}{\bullet_K}$ [structural]

RULE 

RULE 

RULE  [structural]

END MODULE