

IMP

MODULE IMP-SYNTAX

```
SYNTAX  AExp ::= Int
          | String
          | Id
          | ++ Id
          | read ()
          | AExp / AExp [strict, division]
          | AExp + AExp [strict]
          | spawn Block
          | Id = AExp [strict(2)]
          | (AExp) [bracket]
```

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

```
SYNTAX  Block ::= {Stmts}
```

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

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

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

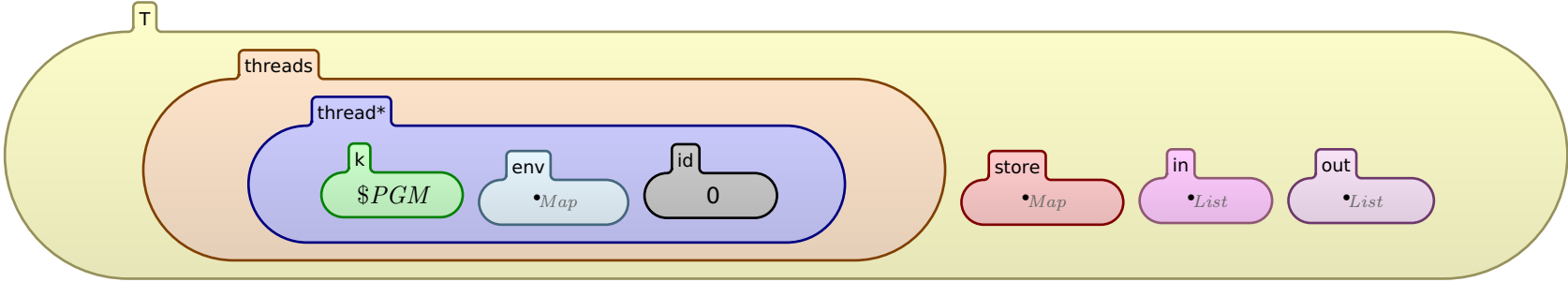
```
SYNTAX  Stmts ::= List{Stmt, "" }
```

END MODULE

MODULE IMP

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

CONFIGURATION:



RULE $\frac{I1 \ / \ I2}{I1 \div_{Int} I2}$ requires $I2 \neq_{Int} 0$

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

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

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

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

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

RULE $\frac{\text{false} \ \&\& \ \text{---}}{\text{false}}$



SYNTAX $K ::= \text{env } (Map)$



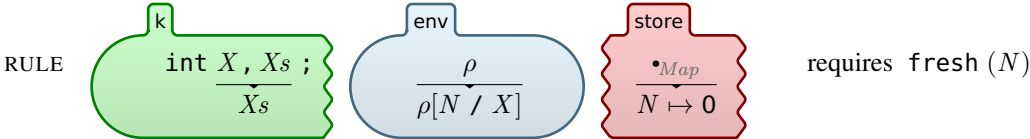
RULE $\frac{\text{---}}{\bullet_K} ;$



RULE $\frac{\text{if } (\text{true})S \text{ else } \text{---}}{S}$

RULE $\frac{\text{if } (\text{false})\text{---} \text{ else } S}{S}$

RULE $\frac{\text{while } (B)S}{\text{if } (B)\{S \text{ while } (B)S\} \text{ else } \{\bullet_{Stmts}\}}$ [structural]



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

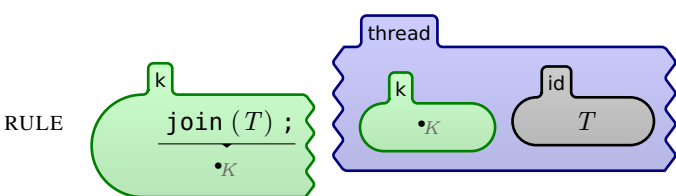
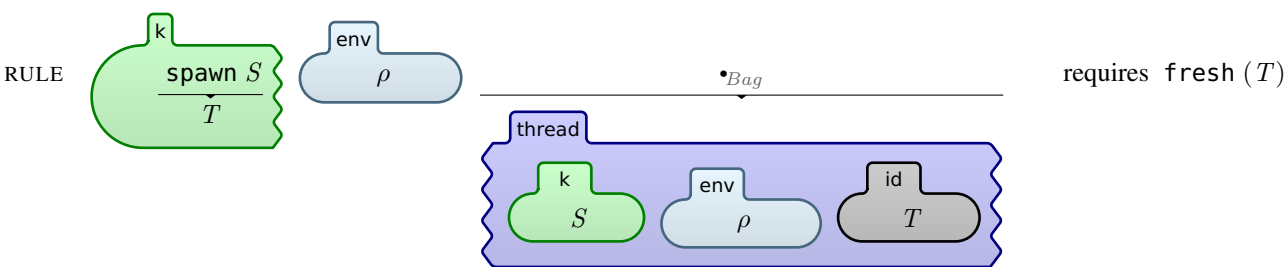
SYNTAX $Printable ::= Int$
 | $String$

SYNTAX $AExp ::= Printable$



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

RULE $\frac{\text{halt} ; \curvearrowright \text{---}}{\bullet_K}$



RULE $\frac{\bullet_{Stmts}}{\bullet_K}$

RULE $\frac{S \ Ss}{S \curvearrowright Ss}$ [structural]

END MODULE