

# IMP

MODULE IMP-SYNTAX

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

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

SYNTAX  Block ::= {Stmts}

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

SYNTAX  Ids ::= List{Id, “,”} [strict]

SYNTAX  AExps ::= List{AExp, “,”} [strict]

SYNTAX  Stmts ::= List{Smt, “”} [seqstrict]
```

END MODULE

MODULE IMP

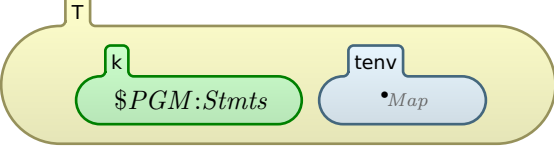
```
SYNTAX  BlockOrSmtType ::= block
          | stmt

SYNTAX  PrintableType ::= int
          | string

SYNTAX  Type ::= PrintableType
          | bool
          | BlockOrSmtType

SYNTAX  KResult ::= Type
```

CONFIGURATION:



RULE  $\frac{\text{---:Int}}{\text{int}}$

RULE  $\frac{\text{---:String}}{\text{string}}$

RULE  $\frac{\text{---} \frac{X:Id}{T}}{T} \quad \text{---} \frac{X \mapsto T}{T}$

RULE  $\frac{\text{---} \frac{++ X:Id}{\text{int}}}{\text{int}} \quad \text{---} \frac{X \mapsto \text{int}}{\text{int}}$

RULE  $\frac{\text{read} ()}{\text{int}}$

SYNTAX AExp ::= Type

RULE  $\frac{\text{int} / \text{int}}{\text{int}}$

RULE  $\frac{\text{int} + \text{int}}{\text{int}}$

RULE  $\frac{\text{string} + \text{string}}{\text{string}}$

RULE  $\frac{\text{spawn block}}{\text{int}}$

RULE  $\frac{\text{---} \frac{X = T}{T}}{T} \quad \text{---} \frac{X \mapsto T}{T}$

SYNTAX BExp ::= Type

RULE  $\frac{\text{---:Bool}}{\text{bool}}$

RULE  $\frac{\text{int} \leq \text{int}}{\text{bool}}$

RULE  $\frac{! \text{ bool}}{\text{bool}}$

RULE  $\frac{\text{bool} \&\& \text{ bool}}{\text{bool}}$

RULE  $\frac{\text{---} \frac{\{Ss\}}{Ss \curvearrowright \rho}}{Ss \curvearrowright \rho} \quad \text{---} \rho$

RULE  $\frac{\text{---} \frac{\text{---:BlockOrSmtType} \curvearrowright \rho}{\text{block}}}{\text{block}} \quad \text{---} \frac{\text{---}}{\rho}$

RULE  $\frac{\text{int} ;}{\text{stmt}}$

SYNTAX Block ::= Type

RULE  $\frac{\text{if (bool) block else block}}{\text{stmt}}$

RULE  $\frac{\text{while (bool) block}}{\text{stmt}}$

RULE  $\frac{\text{---} \frac{\text{int } X:Id, Xs:Ids ;}{\vec{Xs}}}{\vec{Xs}} \quad \text{---} \frac{M:Map}{M[X \leftarrow \text{int}]}$

RULE  $\frac{\text{int } \bullet Ids ;}{\text{stmt}}$

RULE  $\frac{\text{print (---:PrintableType, AEs) ;}}{AEs}$

RULE  $\frac{\text{print } (\bullet AExps) ;}{\text{stmt}}$

RULE  $\frac{\text{halt ;}}{\text{stmt}}$

RULE  $\frac{\text{join int ;}}{\text{stmt}}$

RULE  $\frac{\bullet Stmts}{\text{stmt}}$

RULE  $\frac{\text{---:BlockOrSmtType } Ss}{Ss}$

END MODULE