

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 ::= {Smts}

SYNTAX  Stmt ::= 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  Smts ::= List{Stmt, “”} [seqstrict]
```

END MODULE

MODULE IMP

```
SYNTAX  BlockOrStmtType ::= block
          | stmt

SYNTAX  PrintableType ::= int
          | string

SYNTAX  Type ::= PrintableType
          | bool
          | BlockOrStmtType

SYNTAX  KResult ::= Type
```

CONFIGURATION:



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

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

RULE $\frac{\text{X}}{\text{T}}$ $\frac{\text{X} \mapsto \text{T}}{\text{X} \mapsto \text{T}}$

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

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 $\frac{\text{X} = \text{T}}{\text{T}}$ $\frac{\text{X} \mapsto \text{T}}{\text{X} \mapsto \text{T}}$

SYNTAX BExp ::= Type

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

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

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

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

RULE $\frac{\{Ss\}}{Ss \curvearrowright \text{tenv}(\rho)}$ $\frac{\rho}{\rho}$

SYNTAX K ::= tenv (Map)

RULE $\frac{\text{—} \curvearrowright \text{tenv}(\rho)}{\text{block}}$ $\frac{\rho}{\rho}$

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 $\frac{\text{int X, Xs ;}}{Xs}$ $\frac{\bullet_{Map}}{X \mapsto \text{int}}$

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

RULE $\frac{\text{print (—, AEs) ;}}{AEs}$

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

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

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

RULE $\frac{\bullet_{Smts}}{\text{stmt}}$

RULE $\frac{\text{— } Ss}{Ss}$

END MODULE