

Unstable-Languages-beta: IMPPP-4 *

The PPlanCompS Project

IMPPP-4.cbs | PLAIN | PRETTY

OUTLINE

4 Statements and blocks

Variable declarations

Language "IMPPP"

4 Statements and blocks

Syntax *Stmt* : *stmt* ::= *block*
 | 'int' *ids* ';' ;
 | *aexp* ';' ;
 | 'if' '(' *bexp* ')' *block* 'else' *block*
 | 'while' '(' *bexp* ')' *block*
 | 'print' '(' *aexps* ')' ';' ;
 | 'halt' ';' ;
 | 'join' *aexp* ';' ;

Block : *block* ::= '{' *stmt** '}'

*Suggestions for improvement: plancomps@gmail.com.
Reports of issues: <https://github.com/plancomps/CBS-beta/issues>.

Semantics $\text{execute}[_ : \text{stmt}^*] : \Rightarrow \text{null-type}$

Rule $\text{execute}[\] = \text{null}$

Rule $\text{execute}[\text{'int' } IL \text{' ;' } Stmt^*] =$
 $\text{scope}(\text{collateral}(\text{declare-int-vars}[IL]),$
 $\text{execute}[Stmt^*])$

Otherwise $\text{execute}[Stmt Stmt^+] =$
 $\text{sequential}(\text{execute}[Stmt], \text{execute}[Stmt^+])$

Rule $\text{execute}[AExp \text{' ;' }] =$
 $\text{effect}(\text{eval-arith}[AExp])$

Rule $\text{execute}[\text{'if' } (BExp) \text{' Block}_1 \text{' else' } Block_2] =$
 $\text{if-true-else}(\text{eval-bool}[BExp],$
 $\text{execute}[Block_1],$
 $\text{execute}[Block_2])$

Rule $\text{execute}[\text{'while' } (BExp) \text{' Block}] =$
 $\text{while-true}(\text{eval-bool}[BExp], \text{execute}[Block])$

Rule $\text{execute}[\text{'print' } (AExp) \text{' ;' }] =$
 $\text{print}(\text{eval-arith}[AExp])$

Rule $[\text{'print' } (AExp \text{' ,' } AExps) \text{' ;' }] : \text{stmt}^+ =$
 $[\text{'print' } (AExp) \text{' ;' } \text{'print' } (AExps) \text{' ;' }]$

Rule $\text{execute}[\text{'halt' } \text{' ;' }] = \text{thread-terminate}(\text{current-thread})$

Rule $\text{execute}[\text{'join' } AExp \text{' ;' }] =$
 $\text{thread-join}(\text{lookup-index}(\text{eval-arith}[AExp]))$

Rule $\text{execute}[\text{'{' } Stmt^* \text{' }}] = \text{execute}[Stmt^*]$

Variable declarations

Syntax $IL : \text{ids} ::= \text{id } (\text{' , ' } \text{ids}) ?$

Semantics $\text{declare-int-vars}[_ : \text{ids}] : (\Rightarrow \text{environments})^+$

Rule $\text{declare-int-vars}[I] =$
 $\text{bind}(\text{id}[I], \text{allocate-initialised-variable}(\text{integers}, 0))$

Rule $\text{declare-int-vars}[I \text{' , ' } IL] =$
 $\text{declare-int-vars}[I], \text{declare-int-vars}[IL]$