

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

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