

Languages-beta: IMP-1 *

The PPlanCompS Project

IMP-1.cbs | PLAIN | PRETTY

Language "IMP"

1 Arithmetic expressions

Syntax $AExp : aexp ::=$ num
| id
| aexp '+' aexp
| aexp '/' aexp
| '(' aexp ')'

Semantics $eval\text{-}arith \llbracket _ : aexp \rrbracket : \Rightarrow integers$
Rule $eval\text{-}arith \llbracket N \rrbracket = int\text{-}val \llbracket N \rrbracket$
Rule $eval\text{-}arith \llbracket I \rrbracket = assigned(bound(id \llbracket I \rrbracket))$
Rule $eval\text{-}arith \llbracket AExp_1 '+' AExp_2 \rrbracket =$
integer-add($eval\text{-}arith \llbracket AExp_1 \rrbracket$, $eval\text{-}arith \llbracket AExp_2 \rrbracket$)
Rule $eval\text{-}arith \llbracket AExp_1 '/' AExp_2 \rrbracket =$
checked integer-divide($eval\text{-}arith \llbracket AExp_1 \rrbracket$, $eval\text{-}arith \llbracket AExp_2 \rrbracket$)
Rule $eval\text{-}arith \llbracket '(' AExp ')' \rrbracket = eval\text{-}arith \llbracket AExp \rrbracket$

Syntax $N : num ::=$ '-'?_decimal

Lexis $D : decimal ::=$ ('0'-'9')⁺

Semantics $int\text{-}val \llbracket _ : num \rrbracket : integers$
Rule $int\text{-}val \llbracket D \rrbracket = decimal\text{-}natural("D")$
Rule $int\text{-}val \llbracket '-' D \rrbracket = integer\text{-}negate(int\text{-}val \llbracket D \rrbracket)$

Lexis $I : id ::=$ ('A'-'Z' | 'a'-'z')⁺

Semantics $id \llbracket _ : id \rrbracket : ids$
Rule $id \llbracket I \rrbracket = "I"$

Lexis $keyword ::=$ 'else' | 'false' | 'if' | 'true' | 'while'

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