

# Languages-beta: SIMPLE-3-Statements \*

The P<sub>L</sub>anCompS Project

SIMPLE-3-Statements.cbs | PLAIN | PRETTY

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Language "SIMPLE"

## 3 Statements

```
Syntax Block : block ::= '{' stmts? '}'  
        Stmts : stmts ::= stmt stmts?  
        Stmt  : stmt  ::= imp-stmt | vars-decl  
        ImpStmt : imp-stmt ::= block  
                                | exp ';'   
                                | 'if' '(' exp ')' block ('else' block)?   
                                | 'while' '(' exp ')' block   
                                | 'for' '(' stmt exp ';' exp ')' block   
                                | 'print' '(' exps ')' ';'   
                                | 'return' exp? ';'   
                                | 'try' block 'catch' '(' id ')' block   
                                | 'throw' exp ';' 
```

```
Rule [ [ 'if' '(' Exp ')' Block ] ] : stmt =  
    [ [ 'if' '(' Exp ')' Block 'else' '{' '}' ] ]
```

```
Rule [ [ 'for' '(' Stmt Exp1 ';' Exp2 ')'   
        '{' Stmts '}' ] ] : stmt =  
    [ [ '{' Stmt   
        'while' '(' Exp1 ')'   
        '{' '{' Stmts '}' Exp2 ';' '}'   
        '}' ] ]
```

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\*Suggestions for improvement: [plancomps@gmail.com](mailto:plancomps@gmail.com).  
Reports of issues: <https://github.com/plancomps/CBS-beta/issues>.

Semantics  $\text{exec}[\_ : \text{stmts}] : \Rightarrow \text{null-type}$

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

Rule  $\text{exec}[\{ \text{Stmts} \} ] = \text{exec}[\text{Stmts}]$

Rule  $\text{exec}[\text{ImpStmt Stmts}] =$   
 $\text{sequential}(\text{exec}[\text{ImpStmt}], \text{exec}[\text{Stmts}])$

Rule  $\text{exec}[\text{VarsDecl Stmts}] =$   
 $\text{scope}(\text{declare}[\text{VarsDecl}], \text{exec}[\text{Stmts}])$

Rule  $\text{exec}[\text{VarsDecl}] = \text{effect}(\text{declare}[\text{VarsDecl}])$

Rule  $\text{exec}[\text{Exp};] = \text{effect}(\text{rval}[\text{Exp}])$

Rule  $\text{exec}[\text{if} ( \text{Exp} ) \text{Block}_1 \text{else} \text{Block}_2 ] =$   
 $\text{if-else}(\text{rval}[\text{Exp}], \text{exec}[\text{Block}_1], \text{exec}[\text{Block}_2])$

Rule  $\text{exec}[\text{while} ( \text{Exp} ) \text{Block} ] = \text{while}(\text{rval}[\text{Exp}], \text{exec}[\text{Block}])$

Rule  $\text{exec}[\text{print} ( \text{Exps} ) ; ] = \text{print}(\text{rvals}[\text{Exps}])$

Rule  $\text{exec}[\text{return} \text{Exp};] = \text{return}(\text{rval}[\text{Exp}])$

Rule  $\text{exec}[\text{return};] = \text{return}(\text{null})$

Rule  $\text{exec}[\text{try} \text{Block}_1 \text{catch} ( \text{Id} ) \text{Block}_2 ] =$   
 $\text{handle-throw}(\text{exec}[\text{Block}_1],$   
 $\text{scope}(\text{bind}(\text{id}[\text{Id}], \text{allocate-initialised-variable}(\text{values}, \text{given})),$   
 $\text{exec}[\text{Block}_2])$

Rule  $\text{exec}[\text{throw} \text{Exp};] = \text{throw}(\text{rval}[\text{Exp}])$