

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

The PPlanCompS Project

SL-3-Statements.cbs | PLAIN | PRETTY

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Language "SL"

## 3 Statements

*Syntax*  $Stmt : stmt ::= expr \ ;$   
| `return`  $expr \ ;$   
| `return`  $\ ;$   
| `if`  $( \ expr \ ) \ block$   
| `if`  $( \ expr \ ) \ block \ else \ block$   
| `while`  $( \ expr \ ) \ block$   
| `break`  $\ ;$   
| `continue`  $\ ;$   
|  $block$

$Block : block ::= \{ \ stmt^* \}$

*Rule*  $\llbracket \text{'if' } ( \ Expr \ ) \ Block \rrbracket : stmt =$   
 $\llbracket \text{'if' } ( \ Expr \ ) \ Block \ \text{'else' } \{ \} \rrbracket$

*Semantics*  $exec \llbracket Stmt^* : stmt^* \rrbracket : \Rightarrow \text{null-type}$

*Rule*  $exec \llbracket Expr \ ; \rrbracket = \text{effect}(eval \llbracket Expr \rrbracket)$

*Rule*  $exec \llbracket \text{return} \ Expr \ ; \rrbracket = \text{return}(eval \llbracket Expr \rrbracket)$

*Rule*  $exec \llbracket \text{return} \ ; \rrbracket = \text{return}(\text{null-value})$

*Rule*  $exec \llbracket \text{'if' } ( \ Expr \ ) \ Block_1 \ \text{'else' } \ Block_2 \rrbracket =$   
 $\text{if-true-else}(\text{bool } eval \llbracket Expr \rrbracket, exec \llbracket Block_1 \rrbracket, exec \llbracket Block_2 \rrbracket)$

*Rule*  $exec \llbracket \text{'while' } ( \ Expr \ ) \ Block \rrbracket =$   
 $\text{handle-break}(\text{while-true}(\text{bool } eval \llbracket Expr \rrbracket,$   
 $\text{handle-continue}(exec \llbracket Block \rrbracket)))$

*Rule*  $exec \llbracket \text{'break' } \ ; \rrbracket = \text{break}$

*Rule*  $exec \llbracket \text{'continue' } \ ; \rrbracket = \text{continue}$

*Rule*  $exec \llbracket \{ \ Stmt^* \} \rrbracket = exec \llbracket Stmt^* \rrbracket$

*Rule*  $exec \llbracket \rrbracket = \text{null-value}$

*Rule*  $exec \llbracket Stmt \ Stmt^+ \rrbracket =$   
 $\text{sequential}(exec \llbracket Stmt \rrbracket, exec \llbracket Stmt^+ \rrbracket)$

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