

## TruPL Grammar v1.1 - TruPL 1.0 Without Left Recursion

- Non-terminals (i.e. PROGRAM, IF\_STMT) are shown in ALL CAPS.
- Keywords (i.e. *program*, *if*) are shown in *lowercase italics*.
- Non-keyword terminals (i.e. `identifier`, `mulop`) and special symbols (i.e. `'`, `;`, `+`) are shown in `typewriter font`.

PROGRAM	→	<i>program</i> <code>identifier</code> ; DECL_LIST BLOCK ;
DECL_LIST	→	VARIABLE_DECL_LIST PROCEDURE_DECL_LIST
VARIABLE_DECL_LIST	→	VARIABLE_DECL ; VARIABLE_DECL_LIST   $\lambda$
VARIABLE_DECL	→	IDENTIFIER_LIST : STANDARD_TYPE
PROCEDURE_DECL_LIST	→	PROCEDURE_DECL ; PROCEDURE_DECL_LIST   $\lambda$
IDENTIFIER_LIST	→	<code>identifier</code> IDENTIFIER_LIST_PRM
IDENTIFIER_LIST_PRM	→	, <code>identifier</code> IDENTIFIER_LIST_PRM   $\lambda$
STANDARD_TYPE	→	<i>int</i>   <i>bool</i>
BLOCK	→	<i>begin</i> STMT_LIST <i>end</i>
PROCEDURE_DECL	→	<i>procedure</i> <code>identifier</code> ( PROCEDURE_ARGS ) VARIABLE_DECL_LIST BLOCK
PROCEDURE_ARGS	→	FORMAL_PARM_LIST   $\lambda$
FORMAL_PARM_LIST	→	<code>identifier</code> IDENTIFIER_LIST_PRM : STANDARD_TYPE   <code>identifier</code> IDENTIFIER_LIST_PRM : STANDARD_TYPE ; FORMAL_PARM_LIST
STMT_LIST	→	STMT ; STMT_LIST_PRM   ; STMT_LIST_PRM
STMT_LIST_PRM	→	STMT ; STMT_LIST_PRM   $\lambda$

STMT	→	ASSIGNMENT_STMT   IF_STMT   WHILE_STMT   PRINT_STMT   PROCEDURE_CALL_STMT
ASSIGNMENT_STMT	→	<b>identifier</b> := EXPR
IF_STMT	→	<i>if</i> EXPR <i>then</i> BLOCK   <i>if</i> EXPR <i>then</i> BLOCK <i>else</i> BLOCK
WHILE_STMT	→	<i>while</i> EXPR <i>loop</i> BLOCK
PRINT_STMT	→	<i>print</i> EXPR
PROCEDURE_CALL_STMT	→	<b>identifier</b> ( EXPR_LIST )
EXPR_LIST	→	ACTUAL_PARM_LIST   $\lambda$
ACTUAL_PARM_LIST	→	EXPR   EXPR , ACTUAL_PARM_LIST
EXPR	→	SIMPLE_EXPR   SIMPLE_EXPR <b>relop</b> SIMPLE_EXPR
SIMPLE_EXPR	→	TERM SIMPLE_EXPR_PRM
SIMPLE_EXPR_PRM	→	<b>addop</b> TERM SIMPLE_EXPR_PRM   $\lambda$
TERM	→	FACTOR TERM_PRM
TERM_PRM	→	<b>mulop</b> FACTOR TERM_PRM   $\lambda$
FACTOR	→	<b>identifier</b>   <b>num</b>   ( EXPR )   SIGN FACTOR
SIGN	→	<b>+</b>   <b>-</b>   <i>not</i>