

Grammar for the Itty-Bitty Teaching Language

$S \rightarrow () \mid (S) \mid SS \mid \text{expr}$

$\text{expr} \rightarrow \text{oper} \mid \text{stmts}$

$\text{oper} \rightarrow (:= \text{ name oper}) \mid (\text{binops oper oper}) \mid$
 $(\text{unops oper}) \mid \text{constants} \mid \text{name}$

$\text{binops} \rightarrow + \mid - \mid * \mid / \mid \% \mid ^ \mid = \mid > \mid >= \mid < \mid <= \mid$
 $!= \mid \text{or} \mid \text{and}$

$\text{unops} \rightarrow - \mid \text{not} \mid \text{sin} \mid \text{cos} \mid \text{tan}$

$\text{constants} \rightarrow \text{strings} \mid \text{ints} \mid \text{floats}$

$\text{strings} \rightarrow \text{reg_ex for str literal in C ("any alpha-numeric")} \mid \text{true} \mid \text{false}$

$\text{name} \rightarrow \text{reg_ex for ids in C (any lower and upper char or underscore followed by any combination of lower, upper, digits, or underscores)}$

$\text{ints} \rightarrow \text{reg ex for positive/negative ints in C}$

$\text{floats} \rightarrow \text{reg ex for positive/negative doubles in C}$

$\text{stmts} \rightarrow \text{ifstmts} \mid \text{whilestmts} \mid \text{letstmts} \mid \text{printstmts}$

$\text{printstmts} \rightarrow (\text{stdout oper})$

$\text{ifstmts} \rightarrow (\text{if expr expr expr}) \mid (\text{if expr expr})$

$\text{whilestmts} \rightarrow (\text{while expr exprlist})$

$\text{exprlist} \rightarrow \text{expr} \mid \text{expr exprlist}$

$\text{letstmts} \rightarrow (\text{let (varlist)})$

$\text{varlist} \rightarrow (\text{name type}) \mid (\text{name type}) \text{ varlist}$

$\text{type} \rightarrow \text{bool} \mid \text{int} \mid \text{real} \mid \text{string}$