

## Issues with Grammar

### • Common Prefixes

Prog → func-cycle

func-cycle →  $\epsilon$   
| func-cycle FUNC IDEN SEMICOLON BEGINPARAMS  
  decl-cycle ENDPARAMS BEGINLOCALS decl-cycle  
  ENDLOCALS BEGINBODY stmt-cycle stmt  
  SEMICOLON ENDBODY

decl-cycle →  $\epsilon$   
| decl-cycle decl SEMICOLON

decl → IDEN iden-cycle SEMICOLON

iden-cycle → ε  
| iden-cycle COMMA IDEN arr-cycle INTEGER

arr-cycle → ARRAY L-BRACK NUM R-BRACK OF  
| ARRAY L-BRACK NUM R-BRACK L-BRACK  
NUM R-BRACK OF

stmt-cycle → ε  
| stmt-cycle      stmt      SEMICOLON

var-cycle → {  
| var-cycle COMMA var

assign\_cycle → var ASSIGN exp

if-cycle → IF bool-exp THEN stmt-cycle stmt SEMICOLON ENDIF  
| IF bool-exp THEN stmt-cycle stmt SEMICOLON  
ELSE stmt-cycle stmt SEMICOLON ENDIF

while-cycle → WHILE bool-exp BEGINLOOP stmt-cycle SEMI<sup>m</sup>  
SEMICOLON ENDLOOP

do-cycle → DO BEGINLOOP stmt-cycle stmt SEMICOLON  
ENDLOOP WHILE bool-exp

for-cycle → FOR var ASSIGN NUM SEMICOLON bool-exp  
SEMICOLON var ASSIGN exp BEGINLOOP stmt-cycle stmt  
SEMICOLON ENDLOOP

read-cycle → READ var var-cycle

write-cycle → WRITE var var-cycle

continue-cycle → CONTINUE

return-cycle → RETURN exp

stmt → assign-cycle

| if-cycle

| while-cycle

| do-cycle

- | for-cycle
- | read-cycle
- | write-cycle
- | continue-cycle
- | return-cycle

bool-exp  $\rightarrow$  rel-and-exp-cycle    rel-and-exp

rel-and-exp-cycle  $\rightarrow$   $\epsilon$   
                           | rel-and-exp    OR

rel-and-exp  $\rightarrow$  rel-exp-cycle    rel-exp

rel-exp-cycle  $\rightarrow$   $\epsilon$   
                           | rel-exp-cycle    rel-exp    AND

rel-exp  $\rightarrow$  not-cycle    exp    comp    exp  
                           | not-cycle    TRUE  
                           | not-cycle    FALSE  
                           | not-cycle    L\_PAREN    bool-exp    R\_PAREN

not-cycle  $\rightarrow$   $\epsilon$   
| NOT

comp  $\rightarrow$  EQ  
| NEQ  
| LT  
| GT  
| LTE  
| GTE

exp  $\rightarrow$  mult-exp-cycle mult-exp

mult-exp-cycle  $\rightarrow$   $\epsilon$   
| mult-exp ADD  
| mult-exp SUB

mult-exp  $\rightarrow$  term-cycle term

term-cycle  $\rightarrow$   $\epsilon$   
| term MULT

| term DIV  
| term MOD

term  $\rightarrow$  sub-cycle var  
| sub-cycle NUM  
| sub-cycle L-PAREN exp R-PAREN  
| IDEN L-PAREN exp-cycle R-PAREN  
| IDEN L-PAREN R-PAREN

sub-cycle  $\rightarrow$  {  
| SUB

exp-cycle  $\rightarrow$  exp  
| exp-cycle COMMA exp

var  $\rightarrow$  IDEN  
| IDEN L-BRACK exp R-BRACK  
| IDEN L-BRACK exp R-BRACK L-BRACK

| IDEN L\_BRACK exp R\_BRACK L\_BRACK  
exp R\_BRACK