

Revised Grammar

`<program> ::= <fdecls> <declarations> <statement_seq>.`

`<fdecls> ::= <fdec>;<fdecls_r> | <fdecls_r>`

`<fdecls_r> ::= <fdec>;<fdecls_r> | ϵ`

`<fdec> ::= def <type> <fname> (<params>) <declarations> <statement_seq> fed`

`<params> ::= <type><var><params_opt> | ϵ`

`<params_opt> ::= , <params> | ϵ`

`<fname> ::= <id>`

`<declarations> ::= <decl>;<declarations_r> | <declarations_r>`

`<declarations_r> ::= <decl>;<declarations_r> | ϵ`

`<decl> ::= <type> <varlist>`

`<type> ::= int | double`

`<varlist> ::= <var><varlist_opt>`

`<varlist_opt> ::= , <var><varlist_opt> | ϵ`

`<statement_seq> ::= <statement><statement_seq_opt>`

`<statement_seq_opt> ::= ; <statement><statement_seq_opt> | ϵ`

`<statement> ::=`
 `<var> = <expr> |`
 `if <bexpr> then <statement_seq> <statement_opt> |`
 `while <bexpr> do <statement_seq> od |`
 `print <expr> |`
 `return <expr> |`
 ϵ

`<statement_opt> ::= fi | else <statement_seq> fi`

`<expr> ::= <term><expr_r>`

`<expr_r> ::= + <term><expr_r> | - <term><expr_r> | ϵ`

`<term> ::= <factor><term_r>`

`<term_r> ::= * <factor><term_r> | / <factor><term_r> | % <factor><term_r> | ϵ`

`<factor> ::= <id><factor_opt> | <number> | (<expr>)`

`<factor_opt> ::= (<exprseq>) | [<expr>] | ϵ`

`<exprseq> ::= <expr><exprseq_opt> | ϵ`

`<exprseq_opt> ::= , <expr><exprseq_opt> | ϵ`

`<bexpr> ::= <bterm><bexpr_r>`

`<bexpr_r> ::= or <bterm><bexpr_r> | ϵ`

`<bterm> ::= <bfactor><bterm_r>`

`<bterm_r> ::= and <bfactor><bterm_r> | ϵ`

$\langle \text{bfactor} \rangle ::= (\langle \text{bfactor_opt} \rangle \mid \text{not } \langle \text{bfactor} \rangle$
 $\langle \text{bfactor_opt} \rangle ::= \langle \text{bexpr} \rangle) \mid \langle \text{expr} \rangle \langle \text{comp} \rangle \langle \text{expr} \rangle)$

$\langle \text{comp} \rangle ::= < \mid > \mid == \mid <= \mid >= \mid <>$

$\langle \text{var} \rangle ::= \langle \text{id} \rangle \langle \text{var_opt} \rangle$
 $\langle \text{var_opt} \rangle ::= [\langle \text{expr} \rangle] \mid \epsilon$

$\langle \text{number} \rangle ::= \langle \text{integer} \rangle \mid \langle \text{double} \rangle$

$\langle \text{letter} \rangle ::= \text{a} \mid \text{b} \mid \text{c} \mid \dots \mid \text{z}$

$\langle \text{digit} \rangle ::= 1 \mid 2 \mid 3 \mid 4 \mid 5 \mid 6 \mid 7 \mid 8 \mid 9 \mid 0$

$\langle \text{id} \rangle ::= \langle \text{letter} \rangle \mid \langle \text{id} \rangle \langle \text{letter} \rangle \mid \langle \text{id} \rangle \langle \text{digit} \rangle$