

## VEN Language: EBNF Syntax

$\langle \text{parseVEN} \rangle ::= \langle \text{program} \rangle \text{ EOF}$

$\langle \text{program} \rangle ::= \langle \text{block} \rangle$

$\langle \text{block} \rangle ::= \text{begin } \langle \text{declaration-seq} \rangle \langle \text{command-seq} \rangle \text{end}$

$\langle \text{declaration-seq} \rangle ::= \langle \text{declaration} \rangle \mid \langle \text{declaration-seq} \rangle \langle \text{declaration} \rangle$

$\langle \text{declaration-seq} \rangle ::= \langle \text{declaration} \rangle \{ \langle \text{declaration} \rangle \}$

$\langle \text{declaration} \rangle ::= \langle \text{type} \rangle \langle \text{name-list} \rangle \mid$   
 $\quad \text{proc } \langle \text{name} \rangle = \langle \text{command} \rangle \mid$   
 $\quad \text{proc } \langle \text{name} \rangle (\langle \text{parameter-list} \rangle) = \langle \text{command} \rangle$

$\langle \text{declaration} \rangle ::= \langle \text{type} \rangle \langle \text{name-list} \rangle \mid$   
 $\quad \text{proc } \langle \text{name} \rangle [(\langle \text{parameter-list} \rangle)] = \langle \text{command} \rangle$

$\langle \text{type} \rangle ::= \text{integer} \mid \text{Boolean}$

$\langle \text{parameter-list} \rangle ::= \langle \text{type} \rangle \langle \text{name-list} \rangle \mid \langle \text{parameter-list} \rangle ; \langle \text{type} \rangle \langle \text{name-list} \rangle$

$\langle \text{parameter-list} \rangle ::= \langle \text{type} \rangle \langle \text{name-list} \rangle \{ ; \langle \text{type} \rangle \langle \text{name-list} \rangle \}$

$\langle \text{name-list} \rangle ::= \langle \text{name} \rangle \mid \langle \text{name-list} \rangle , \langle \text{name} \rangle$

$\langle \text{name-list} \rangle ::= \langle \text{name} \rangle \{ , \langle \text{name} \rangle \}$

$\langle \text{command-seq} \rangle ::= \langle \text{command} \rangle \mid \langle \text{command-seq} \rangle ; \langle \text{command} \rangle$

$\langle \text{command-seq} \rangle ::= \langle \text{command} \rangle \{ ; \langle \text{command} \rangle \}$

**<command> ::= <name> := <expr> |  
    read <name> |  
    write <expr> |  
    if <expr> then <command-seq> end if |  
    if <expr> then <command-seq> else <command-seq> end if |  
    while <expr> do <command-seq> end while |  
    call <name> |  
    call <name> (<name-list>) |  
    <block>**

**<command> ::= <name> := <expr> |  
    read <name> |  
    write <expr> |  
    if <expr> then <command-seq> [else <command-seq>] end if |  
    while <expr> do <command-seq> end while |  
    call <name> [(<name-list>)] |  
    <block>**

**<expr> ::= <expr1> | <expr> or <expr1>**

**<expr> ::= <expr1> {or <expr1>}**

**<expr1> ::= <expr2> | <expr1> and <expr2>**

**<expr1> ::= <expr2> {and <expr2>}**

**<expr2> ::= <expr3> | not <expr>**

**<expr3> ::= <expr4> | <expr3> <relation> <expr4>**

**<expr3> ::= <expr4> {<relation> <expr4>}**

**<expr4> ::= <term> | <expr4> <weak op> <term>**

**<expr4> ::= <term> {<weak op> term}**

**<term> ::= <element> | <term> <strong op> <element>**

**<term> ::= <element> {<strong op> <element>}**

$\langle \text{element} \rangle ::= \langle \text{numeral} \rangle \mid \langle \text{name} \rangle \mid (\langle \text{expr} \rangle) \mid -\langle \text{element} \rangle$

$\langle \text{element} \rangle ::= [-] \langle \text{elem} \rangle$

$\langle \text{elem} \rangle ::= \langle \text{numeral} \rangle \mid \langle \text{name} \rangle \mid (\langle \text{expr} \rangle)$

$\langle \text{relation} \rangle ::= < \mid \leq \mid <> \mid = \mid > \mid \geq$

$\langle \text{weak op} \rangle ::= + \mid -$

$\langle \text{strong op} \rangle ::= * \mid /$

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

$\langle \text{name} \rangle ::= [\langle \text{ident} \rangle] \langle \text{letter} \rangle \mid \langle \text{ident} \rangle \langle \text{digit} \rangle$

$\langle \text{letter} \rangle ::= a \mid b \mid c \mid d \mid e \mid f \mid g \mid h \mid i \mid j \mid k \mid l \mid m \mid n \mid o \mid$   
 $p \mid q \mid r \mid s \mid t \mid u \mid v \mid w \mid x \mid y \mid z$

$\langle \text{numeral} \rangle ::= \langle \text{digit} \rangle \mid \langle \text{digit} \rangle \langle \text{numeral} \rangle$

$\langle \text{numeral} \rangle ::= \langle \text{digit} \rangle \{ \langle \text{digit} \rangle \}$

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