⟨*program*⟩ → ⟨*roots*⟩

⟨*roots*⟩ → ε
| ⟨*root*⟩ ⟨*roots*⟩

⟨*root*⟩ → ⟨*dcl*⟩;
| ⟨*function*⟩
| ⟨*comment*⟩

⟨*dcl*⟩ → ⟨*type*⟩ ⟨*id*⟩ ⟨*dclend*⟩

⟨*type*⟩ → ⟨*primitivetype*⟩ ⟨*arraytype*⟩

⟨*primitivetype*⟩ → bool
| double
| int
| char
| container
| string

⟨*arraytype*⟩ → ⟨*type*⟩ [ ]
| ε

⟨*id*⟩ → ⟨*letter*⟩ ⟨*idend*⟩

⟨*letter*⟩ → [a - zA - Z]

⟨*idend*⟩ → ⟨*letter*⟩ ⟨*idend*⟩
| ⟨*digit*⟩ ⟨*idend*⟩
| ε

⟨*dclend*⟩ → ε
| ⟨*assign*⟩

⟨*assign*⟩ → <-- ⟨*expr*⟩

⟨*expr*⟩ → ⟨*term*⟩ ⟨*exprend*⟩

⟨*term*⟩ → ⟨*comp*⟩ ⟨*termend*⟩

⟨*comp*⟩ → ⟨*factor*⟩ ⟨*compend*⟩

⟨*factor*⟩ → (⟨*expr*⟩)
| !(⟨*expr*⟩)
| ⟨*callid*⟩
| ⟨*numeric*⟩
| ⟨*string*⟩
| ⟨*functioncall*⟩
| ⟨*cast*⟩
| LOW
| HIGH
| true
| false

⟨*callid*⟩ → ⟨*id*⟩ ⟨*arraycall*⟩

⟨*arraycall*⟩ → [⟨*notnulldigits*⟩]
| *ε*

⟨*notnulldigits*⟩ → ⟨*notnulldigit*⟩ ⟨*digits*⟩

⟨*notnulldigit*⟩ → [1 - 9]

⟨*digits*⟩ → *ε*
| ⟨*digit*⟩ ⟨*digits*⟩

⟨*digit*⟩ → [0 - 9]

⟨*numeric*⟩ → ⟨*plusminus*⟩ ⟨*digitsnotempty*⟩ ⟨*numericend*⟩

⟨*plusminus*⟩ → *ε*
| -

⟨*digitsnotempty*⟩ → ⟨*digit*⟩ ⟨*digits*⟩

⟨*numericend*⟩ → *ε*
| . ⟨*digitsnotempty*⟩

⟨*string*⟩ → "⟨*stringmidt*⟩"

⟨*stringmidt*⟩ → ⟨*letter*⟩ ⟨*stringmidt*⟩
| ⟨*symbol*⟩ ⟨*stringmidt*⟩
| ⟨*digit*⟩ ⟨*stringmidt*⟩
| *ε*

⟨*symbol*⟩ → !
| %
| ^
| &
| (
|)
| _
| +
| |
| ~
| -
| =
| `
| {
| }
| [
|]
| :
| ;
| ?
| ,
| .

| / |
| , , |

⟨*functioncall*⟩ → call ⟨*id*⟩ (⟨*callexpr*⟩)

⟨*callexpr*⟩ → ⟨*subcallexpr*⟩
| *ε*

⟨*subcallexpr*⟩ → ⟨*expr*⟩ ⟨*subcallexprend*⟩

⟨*subcallexprend*⟩ → , ⟨*subcallexpr*⟩
| *ε*

⟨*cast*⟩ → ⟨*type*⟩ (⟨*expr*⟩)

⟨*compend*⟩ → ⟨*comparisonoperator*⟩ ⟨*comp*⟩
| *ε*

⟨*comparisonoperator*⟩ → `>`
| `<`
| `<=`
| `>=`
| `!=`
| `=`

⟨*termend*⟩ → * ⟨*term*⟩
| / ⟨*term*⟩
| AND ⟨*term*⟩
| *ε*

⟨*exprend*⟩ → + ⟨*expr*⟩
| - ⟨*expr*⟩
| OR ⟨*expr*⟩
| *ε*

⟨*function*⟩ → ⟨*functionstart*⟩ ⟨*functionmidt*⟩

⟨*functionstart*⟩ → function ⟨*id*⟩ return

⟨*functionmidt*⟩ → ⟨*type*⟩ ⟨*functionend*⟩ ⟨*expr*⟩; end
| nothing ⟨*functionend*⟩ nothing; end

⟨*functionend*⟩ → using (⟨*params*⟩) begin ⟨*stmts*⟩ return

⟨*params*⟩ → ⟨*subparams*⟩
| *ε*

⟨*subparams*⟩ → ⟨*type*⟩ ⟨*id*⟩ ⟨*subparamsend*⟩

⟨*subparamsend*⟩ → , ⟨*subparams*⟩
| *ε*

⟨*stmts*⟩ → *ε*
| ⟨*stmt*⟩ ⟨*stmts*⟩

⟨*stmt*⟩ → ⟨*callid*⟩ ⟨*assign*⟩;
| ⟨*if*⟩
| ⟨*while*⟩
| ⟨*from*⟩
| ⟨*dcl*⟩;
| ⟨*functioncall*⟩;
| ⟨*switch*⟩
| ⟨*comment*⟩

⟨*if*⟩ → if(⟨*expr*⟩) begin ⟨*stmts*⟩ end ⟨*endif*⟩

⟨*endif*⟩ → else ⟨*else*⟩
| ε

⟨*else*⟩ → ⟨*if*⟩
| begin ⟨*stmts*⟩ end

⟨*while*⟩ → while(⟨*expr*⟩) begin ⟨*stmts*⟩ end

⟨*from*⟩ → from ⟨*expr*⟩ to ⟨*expr*⟩ step ⟨*assign*⟩ begin ⟨*stmts*⟩ end

⟨*switch*⟩ → switch (⟨*expr*⟩) begin ⟨*cases*⟩ end

⟨*cases*⟩ → case ⟨*expr*⟩: ⟨*stmts*⟩ ⟨*endcase*⟩

⟨*endcase*⟩ → ⟨*cases*⟩
| break; ⟨*breakend*⟩
| default: ⟨*stmts*⟩ break;

⟨*breakend*⟩ → ⟨*cases*⟩
| default: ⟨*stmts*⟩ break;
| ε

⟨*comment*⟩ → /* ⟨*stringmidt*⟩ */