

Tiny Programming Language

Context Free Grammar

Production Rules:

1. Program \rightarrow Function_Statements Main_Function

Function_Statements \rightarrow Function_Statement Function_Statements $\mid \epsilon$

2. Main_Function \rightarrow Datatype main() Function_Body

3. Function_Statement \rightarrow Function_Declaration Function_Body

4. Function_Body \rightarrow {Statements Return_Statement}

5. Function_Declaration \rightarrow Datatype Function_Name (Parameter_List)

Parameter_List \rightarrow Parameter More_Parameters $\mid \epsilon$

More_Parameters \rightarrow , Parameter More_Parameters $\mid \epsilon$

6. Parameter \rightarrow Datatype Identifier

7. Function_Name \rightarrow Identifier

8. Repeat_Statement \rightarrow repeat Statements until Condition_Statement

9. If_Statement \rightarrow if Condition_Statement Comment_Statement then Statements Else_Close

10. Else_If_Statement \rightarrow elseif Condition_Statement Comment_Statement then Statements Else_Close

11. Else_Statement \rightarrow else Statements end

12. Comment_Statement \rightarrow Comment Comment_Statement $| \epsilon$

13. Else_Close \rightarrow Else_If_Statement $|$ Else_Statement $|$ end

14. Condition_Statement \rightarrow Condition Condition_End

Condition_End \rightarrow Boolean_Operator Condition Condition_End $| \epsilon$

15. Boolean_Operator \rightarrow AndOp $|$ OrOp

16. Condition \rightarrow Identifier Condition_Operator Term

17. Condition_Operator \rightarrow LessThanOp $|$ GreaterThanOp $|$ EqualOp $|$ NotEqualOp

18. Return_Statement \rightarrow return Expression;

19. Read_Statement \rightarrow read Identifier;

20. Write_Statement \rightarrow write Write_Expression;

Write_Expression \rightarrow Expression $|$ endl

21. Declaration_Statement \rightarrow Datatype Declare_Rest ;

Declare_Rest \rightarrow Identifier Declare_Identifiers | Assignment_Statement Declare_Identifiers

Declare_Identifiers \rightarrow , Identifier Declare_Identifiers | , Assignment_Statement Declare_Identifiers | ϵ

22. Datatype \rightarrow int | float | string

23. Assignment_Statement \rightarrow Identifier AssignOp Expression

24. Expression \rightarrow StringLiteral | Term | Equation

25. Equation \rightarrow Term Equation_End | '(' Equation ')' Equation_End

Equation_End \rightarrow Arithmetic_Operator Equation Equation_End | ϵ

26. Arithmetic_Operator \rightarrow PlusOp | MinusOp | MultiplyOp | DivideOp

27. Term \rightarrow Number | Identifier | Function_Call

28. Function_Call \rightarrow Identifier (Identifier_List)

Identifier_List \rightarrow Identifier More_Identifiers | ϵ

More_Identifiers \rightarrow , Identifier More_Identifiers | ϵ

29. Statements \rightarrow Statement Statements | ϵ

Statement \rightarrow Repeat_Statement | Function_Call | If_Statement | Read_Statement | Write_Statement |
Declaration_Statement | Assignment_Statement | Comment_Statement

AndOp \rightarrow &&

OrOp \rightarrow ||

LessThanOp → <

GreaterThanOp → >

EqualOp → =

NotEqualOp → <>

AssignOp → :=

PlusOp → +

MinusOp → -

MultiplyOp → *

DivideOp → /

Terminals:

int | float | string | read | write | repeat | until | if | elseif | else | then | return | endl | identifier | StringLiteral |

Number | + | - | * | / | < | > | = | <> | := | ! | " | # | \$ | % | & | ' | (|) | , | . | : | ; | ? | @ | [| \ |] | ^ | _ | ` |

{ | } | ~ | && | || | [a-zA-z] | [0-9] | ε