

Milestone 2

Team number:4

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Tiny CFG Rules:

1. $\text{Program} \rightarrow \text{Function_statements} \text{ Main_Function}$
2. $\text{Function_statements} \rightarrow \text{Function_statements}$
 $\text{Function_statement} \mid \epsilon$
 - $\text{Function_statements} \rightarrow \text{Function_statement}$
 $\text{Function_statements} \mid \epsilon$
 - $\text{Function_Statement} \rightarrow \text{Function_Declaration}$
 Function_Body
3. $\text{Main_Function} \rightarrow \text{Datatype } \mathbf{main} () \text{ Function_Body}$
4. $\text{Function_Body} \rightarrow \{ \text{Statements Return_Statement} \}$
5. $\text{Statements} \rightarrow \text{Statements Statement} \mid \text{Statement}$
 - $\text{Statements} \rightarrow \text{Statement Statements}' \mid \epsilon$
 - $\text{Statements}' \rightarrow \text{Statement Statements}' \mid \epsilon$
6. $\text{Statement} \rightarrow \text{Assignment_Statement} ;$
 $\mid \text{Declaration_Statement}$
 $\mid \text{Write_Statement}$
 $\mid \text{Read_Statement}$
 $\mid \text{Condition_Statement}$
 $\mid \text{If_Statement}$
 $\mid \text{Repeat_Statement}$
 $\mid \text{Function_Call} ;$
 $\mid \text{comment}$
7. $\text{Function_Declaration} \rightarrow \text{Datatype Function_Name}$
 (Parameters)
8. $\text{Parameters} \rightarrow \text{Parameters Parameter} \mid \text{Parameter} \mid \epsilon$

- Parameters \rightarrow Parameter Parameters2 | ϵ
- Parameters2 \rightarrow , Parameters | ϵ

- Parameter \rightarrow Datatype **identifier**
- Function_Name \rightarrow **identifier**
- Repeat_Statement \rightarrow **repeat** Statements **until** Condition_Statement
- Condition_Statement \rightarrow Condition Boolean_Op Condition_Statement | Condition
- Condition_Statement \rightarrow Condition Conditions
- Conditions \rightarrow Boolean_Op Condition Conditions | ϵ
- If_Statement \rightarrow **if** Condition_Statement **then** StatementsOrReturn Rest_if
- Rest_if \rightarrow Else_If_Statement | Else_Statement | **end**
- StatementsOrReturn \rightarrow Statements StatementsOrReturn | Return_Statement | ϵ
- Else_If_Statement \rightarrow **elseif** Condition_Statement **then** StatementsOrReturn Rest_if
- Else_Statement \rightarrow **else** StatementsOrReturn **end**
- Return_Statement \rightarrow **return** Expression ;
- Read_Statement \rightarrow **read identifier** ;
- Write_Statement \rightarrow **write** Write' ;
- Write' \rightarrow Expression | **endl**
- Declaration_Statement \rightarrow Datatype Identifiers ;
- Identifiers \rightarrow Identifiers ,
(**identifier** | Assignment_Statement)
| (**identifier** | Assignment_Statement)
 - Identifiers \rightarrow **identifier** Identifiers' | Assignment_Statement Identifiers'
 - Identifiers' \rightarrow , Identifiers | ϵ
- Datatype \rightarrow **int** | **float** | **string**

25. Assignment_Statement \rightarrow **identifier** := Expression
26. Expression \rightarrow **string** | Term | Equation
27. Arithmetic_Op \rightarrow Add_Op | Mult_Op
28. Boolean_Op \rightarrow "&&" | "||"
29. Condition_Op \rightarrow < | > | = | <>
30. Function_Call \rightarrow Function_Name (Arguments)
31. Arguments \rightarrow Arguments , Argument | Argument | ϵ
 - Arguments \rightarrow Argument args2 | ϵ
 - args2 \rightarrow , Argument args2 ϵ
32. Condition \rightarrow **identifier** Condition_Op Term
33. Argument \rightarrow **Identifier** | **Number**
34. Term \rightarrow **number** | **identifier** | Function_Call
35. Add_Op \rightarrow + | -
36. Mult_Op \rightarrow * | /
37. Equation \rightarrow Equation Add_Op Factor | Factor
 - Equation \rightarrow Factor Equation '
 - Equation ' \rightarrow Add_Op Factor Equation ' | ϵ
37. Factor \rightarrow Factor Mult_Op Term | Term
 - Factor \rightarrow (Equation) Factor' | Term Factor'
 - Factor' \rightarrow Mult_Op Equation Factor' | ϵ

• Non-Terminals

1. Function_Call , Term , Arithmetic_Op , Equation ,Equation' ,Expression , Assignment_Statement , Datatype , Declaration_Statement , Write_Statement , Read_Statement

,Return_Statement ,Condition_Op , Condition , Boolean_Op ,
 Condition_Statement , Conditions , If_Statement , Else_If_Statement
 , Else_Statement , Repeat_Statement , Function_Declaration
 ,Function_Body , Function_Statements , Main_Function ,
 Program, Function_statement, Statements, Statement ,Statement'
 ,Write' ,Rest_if ,StatementsOrReturn ,Identifiers ,Identifiers'
 ,Parameters ,Parameter ,Parameters2 ,Repeat_Statement ,Factor
 ,Factor' ,Arguments ,args2 ,Add_Op ,Mult_Op, Function_Name,
 Argument.

• **Terminals**

- *main , (,) , { , } , identifier , repeat , until , if , then , elseif, else ,
 end , return , read , write , endl , int , float , string , && , || , + , - ,
 * , / , < , > , <> , = , number, ; , := , ,*

