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# Compiler Phase (2)

# Context Free Grammar

# Context Free Grammar (CFG)

1. Program🡪 Prog Main\_Function
2. Prog🡪 Function\_Statment Prog |
3. Expression🡪 **string** | Term | Equation
4. Equation 🡪 Factor Equation'
5. Equation' 🡪 Add\_Op Factor Equation' |
6. Factor 🡪 **(** Equation **)** Factor' | Term Factor'
7. Factor' 🡪 Mult\_Op Equation Factor' |
8. Term 🡪 **number** | **identifier** | Function\_Call
9. AddOp 🡪 **+** | **-**
10. MultOp 🡪 **\*** | **/**
11. If\_Statment 🡪 **if** Condition\_Statement **then** Multi\_Stats Else\_if\_Statement Else
12. Else\_if\_Statement🡪**elseif** Condition\_Statement **then** Multi\_Stats Else\_if\_Statement |
13. Else🡪 **else** Multi\_Stats **end** | **end**
14. Declaration\_Statment ->Datatype IdList ;
15. DataType🡪**int** | **float** | **string**
16. IdList → **identifier** IdList’
17. IdList’ → , **identifier** IdList’ | **:=** Expression IdList’ |
18. Write\_Statement 🡪**write** Write’ ;
19. Write’🡪 Expression | **endl**
20. Read\_Statement🡪**read** Exp **;**
21. Condition\_operator 🡪 **<** | **>** | **<>** | **=**
22. Condition\_Statement 🡪 Condition OP
23. OP 🡪 **&&** Condition\_Statement | **||** Condition\_Statement | **ε**
24. Condition🡪 **identifier** Condition\_operator Term
25. Assignment\_Statement 🡪 **identifier**  **:=** Expression ;
26. Functions\_Declaration 🡪 DataType **identifier** (Parameters )
27. Function\_body 🡪 **{** Multi\_Stats Return\_Statment**}**
28. Function\_Statment 🡪 Functions\_Declaration Function\_body
29. Main\_Function 🡪 DataType **main** **()** Function\_body
30. Parameters 🡪 DataType **identifier** Param |
31. Param 🡪 **,** DataType **identifier** Param |
32. Return\_Statment 🡪**return** Expression;
33. Repeat\_Statment 🡪 **repeat** Multi\_Stat **until** Condition\_Statment
34. Multi\_Stats 🡪 Statements Multi\_Stats |
35. Statements 🡪 Assignment\_Statment| Expression| Declaration\_Statment|Write\_Statment| Read\_Statment | If\_Statment | Repeate\_Statment
36. Function\_Call🡪**(** Input**)**
37. Input 🡪 **identifier** In |
38. In 🡪 , **identifier** In |

## Terminals

1. string
2. int
3. float
4. number
5. endl
6. +
7. -
8. \*
9. /
10. <
11. >
12. =
13. :=
14. <>
15. ,
16. (
17. )
18. {
19. }
20. if
21. then
22. end
23. elseif
24. else
25. identifier
26. return
27. repeat
28. until
29. write
30. read
31. ||
32. &&
33. main
34. ;