



Compilers' Theory

Milestone -2-

Note: *Terminal_tokens* are written in bold and italic. non_Terminal_tokens are written in Bold.

1. **Program** → UserFunc MainFunc.
2. **UserFunc** → Function | ϵ
3. **MainFunc** → Datatype *main ()* Body
4. **Function** → Fun_dec Body UserFunc
5. **Fun_dec** → Datatype *identifier* ArgList
6. **Datatype** → *int* | *float* | *string*
7. **ArgList** → (*Arguments*) | ()
8. **Arguments** → *Arguments, identifier* | *identifier* (left recursive)
 - *Arguments* → Datatype *identifier* Arg
 - *Arg* →, Datatype *identifier* Arg | ϵ
9. **Body** → {Stat_seq return-stmt }
10. **Stat_Seq** → *Stat_Seq ; Statement* | *Statement* (left recursive)
 - *Stat_Seq* → Statement State
 - *State* → ; Statement State | ϵ
11. **Statement** → if-stmt | repeat-stmt | assign-or-funcallstmt
| read-stmt | write-stmt | Decl-stmt | return-stmt
12. **if-stmt** → *if* Condition *then* Stat_Seq ElseClosure



13. **elseif-stmt** \rightarrow **elseif** Condition **then** Stat_Seq ElseClosure

14. **ElseClosure** \rightarrow **else** Stat_Seq **end** | elseif-stmt

15. **Condition** \rightarrow Expression RelOp Expression ConditionClosure

16. **ConditionClosure** \rightarrow ConditionOps Condition | ϵ

17. **assign-or-funcallstmt** \rightarrow **assign-stmt** | **fun-call** (left factoring)

- **assign-or-funcallstmt** \rightarrow **identifier** A
- A \rightarrow fun-call | assign-stmt

18. **Equation** \rightarrow **Equation** AddOp Term | Term (left recursive)

- **Equation** \rightarrow Term Equ
- **Equ** \rightarrow AddOp Term Equ | ϵ

19. **Term** \rightarrow **Term** MultOp Factor | Factor (left recursive)

- **Term** \rightarrow Factor Ter
- **Ter** \rightarrow MultOp Factor Ter | ϵ

20. **Factor** \rightarrow **constant** | **identifier** | **FunCall** (left factoring)

- **Factor** \rightarrow **constant** | **identifier** A | (Expression)
- A \rightarrow fun-call | ϵ

21. **RelOp** \rightarrow < | > | = | <>

22. **CondatonOps** \rightarrow “//” | &&

23. **AddOp** \rightarrow + | -

24. **MultOp** \rightarrow * | /

25. **Expression** \rightarrow **String** | **Term** | **Equation** (left factoring)

- **Expression** \rightarrow **String** | exp



- **exp** → Term E
- **E** → Equ | ϵ

26. **repeat-stmt** → **repeat** Stat_Seq **until** Expression

27. **assign-stmt** → **identifier** := Expression

28. **read-stmt** → **read identifier**

29. **write-stmt** → **write** Expression

30. **Decl-stmt** → DataType Id

31. **Id** → **identifier** | **assign-stmt** IdClosure

(left factoring)

- **Id** → **identifier** B IdClause
- **B** → **assign-stmt** | ϵ

32. **IdClause** → , Id | ϵ

33. **fun-call** → callArgList

34. **CallArgList** → (ArgumentsCall) | ()

35. **ArgumentsCall** → **ArgumentsCall**, **identifier** | **identifier** (left recursive)

- **ArgumentsCall** → **identifier** ArgCall
- **ArgCall** → , **identifier** ArgCall | ϵ

36. **return-stmt** → **return** Expression