

1. <program> ==> <otherFunctions> <mainFunction>
2. <mainFunction>==> TK_MAIN <stmts> TK_END
3. <otherFunctions>==> <function><otherFunctions> | ∈
4. <function>==>TK_FUNID <input_par> <output_par> TK_SEM <stmts> TK_END
5. <input_par>==>TK_INPUT TK_PARAMETER TK_LIST TK_SQL <parameter_list> TK_SQR
6. <output_par>==>TK_OUTPUT TK_PARAMETER TK_LIST TK_SQL <parameter_list> TK_SQR| ∈
7. <parameter_list>==><dataType> TK_ID <remaining_list>
8. <dataType>==> <primitiveDatatype> |<constructedDatatype>
9. <primitiveDatatype>==> TK_INT | TK_REAL
10. <constructedDatatype>==>TK_RECORD TK_RUID | TK_UNION TK_RUID | TK_RUID
11. <remaining_list>==>TK_COMMA <parameter_list> | ∈
12. <stmts> ==> <typeDefinitions> <declarations> <otherStmts><returnStmt>
13. <typeDefinitions> ==> <typeDefinition><typeDefinitions>| <definetypestmt> <typeDefinitions> | ∈
14. <typeDefinition> ==>TK_RECORD TK_RUID <fieldDefinitions> TK_ENDRECORD
15. <typeDefinition> ==>TK_UNION TK_RUID <fieldDefinitions> TK_ENDUNION
16. <fieldDefinitions> ==> <fieldDefinition><fieldDefinition><moreFields>
17. <fieldDefinition> ==> TK_TYPE <dataType> TK_COLON TK_FIELDID TK_SEM
18. <moreFields> ==><fieldDefinition><moreFields> | ∈
19. <declarations> ==> <declaration><declarations> | ∈
20. <declaration> ==> TK_TYPE <dataType> TK_COLON TK_ID <global_or_not> TK_SEM
21. <global_or_not> ==> TK_COLON TK_GLOBAL| ∈
22. <otherStmts> ==> <stmt><otherStmts> | ∈
23. <stmt> ==> <assignmentStmt> | <iterativeStmt> | <conditionalStmt> | <ioStmt> | <funCallStmt>
24. <assignmentStmt>==><SingleOrRecId> TK_ASSIGNOP <arithmeticExpression> TK_SEM
25. <singleOrRecId>==>TK_ID
26. ==> TK_DOT TK_FIELDID | ∈
27. <funCallStmt>==><outputParameters> TK_CALL TK_FUNID TK_WITH TK_PARAMETERS <inputParameters> TK_SEM
28. <outputParameters> ==> TK_SQL <idList> TK_SQR TK_ASSIGNOP | ∈
29. <inputParameters>==> TK_SQL <idList> TK_SQR
30. <iterativeStmt>==> TK_WHILE TK_OP <booleanExpression> TK_CL <stmt><otherStmts>TK_ENDWHILE
31. <conditionalStmt>==> TK_IF TK_OP <booleanExpression> TK_CL TK_THEN <stmt><otherStmts> <else> TK_ENDIF
32. <else> ==>TK_ELSE <otherStmts> | ∈
33. <ioStmt>==>TK_READ TK_OP <var> TK_CL TK_SEM | TK_WRITE TK_OP <var> TK_CL TK_SEM
34. <arithmeticExpression> ==> <addORsub>
35. <addORsub> ==> <mulORdiv> <ADDSUB> <addORsub> | <mulORdiv>
36. <mulORdiv> ==> <brackets> <MULDIV> <mulORdiv> | <brackets>
37. <brackets> ==> TK_OP <arithmeticExpression> TK_CL | <var>
38. <MULDIV> ==> TK_MUL | TK_DIV
39. <ADDSUB> ==> TK_PLUS | TK_MINUS
40. <booleanExpression>==>TK_OP <booleanExpression> TK_CL <logicalOp> TK_OP <booleanExpression> TK_CL
41. <booleanExpression>==> <var> <relationalOp> <var>
42. <booleanExpression>==> TK_NOT TK_OP <booleanExpression> TK_CL
43. <var>==> <singleOrRecId> | TK_NUM | TK_RNUM

- 44. <logicalOp>====>TK_AND | TK_OR
- 45. <relationalOp>====> TK_LT | TK_LE | TK_EQ |TK_GT | TK_GE | TK_NE
- 46. <returnStmt>====>TK_RETURN <optionalReturn> TK_SEM
- 47. <optionalReturn>====>TK_SQL <idList> TK_SQR | ϵ
- 48. <idList>====> TK_ID <more_ids>
- 49. <more_ids>====> TK_COMMA <idList> | ϵ
- 50. <definetypesmt>====>TK_DEFINETYPE <A> TK_RUID TK_AS TK_RUID
- 51. <A> ====>TK_RECORD | TK_UNION

GRAMMER	FIRST()	FOLLOW()
<program>	TK_FUNID, TK_MAIN	\$
<main function>	TK_MAIN	\$
<other functions>	TK_FUNID, epsilon	TK_MAIN
<function>	TK_FUNID	TK_FUNID, TK_MAIN
<input_par>	TK_INPUT	TK_OUTPUT, TK_SEM
<output_par>	TK_OUTPUT, epsilon	TK_SEM
<parameter_list>	TK_INT, TK_REAL, TK_RECORD, TK_UNION, TK_RUID	TK_SQR
<dataType>	TK_INT, TK_REAL, TK_RECORD, TK_UNION, TK_RUID	TK_ID
<primitiveDatatype>	TK_INT, TK_REAL	TK_ID
<constructedDatatype>	TK_RECORD, TK_UNION, TK_RUID	TK_ID
<remaining_list>	TK_COMMA, epsilon	TK_SQR
<stmts>	TK_RECORD, TK_UNION, TK_DEFINETYPE, TK_TYPE, TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN	TK_END
<typeDefinitions>	TK_RECORD, TK_UNION, TK_DEFINETYPE, epsilon	TK_TYPE, TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN
<typeDefinition>	TK_RECORD, TK_UNION	TK_RECORD, TK_UNION, TK_DEFINETYPE, TK_TYPE, TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN
<fieldDefinitions>	TK_TYPE	TK_ENDRECORD, TK_ENDUNION
<fieldDefinition>	TK_TYPE	TK_TYPE, TK_ENDRECORD, TK_ENDUNION
<moreFields>	TK_TYPE, epsilon	TK_ENDRECORD, TK_ENDUNION
<declarations>	TK_TYPE, epsilon	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN
<delaration>	TK_TYPE	TK_TYPE, TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN
<global_or_not>	TK_COLON, epsilon	TK_SEM
<otherStmts>	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, epsilon	TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<stmt>	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<assignmentStmt>	TK_ID	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<singleOrRecId>	TK_ID	TK_ASSIGNOP, TK_CL, TK_SEM, TK_CL, TK_ADD, TK_SUB, TK_MUL, TK_DIV, TK_LT, TK_LE, TK_EQ, TK_GT, TK_GE, TK_NE
	TK_DOT, epsilon	TK_ASSIGNOP, TK_CL, TK_SEM, TK_CL, TK_ADD, TK_SUB, TK_MUL, TK_DIV, TK_LT, TK_LE, TK_EQ, TK_GT, TK_GE, TK_NE
<funCallStmt>	TK_SQL, TK_CALL	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<outputParameters>	TK_SQL, epsilon	TK_CALL
<inputParameters>	TK_SQL	TK_SEM
<iterativeStmt>	TK_WHILE	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<conditionalStmt>	TK_IF	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<ioStmt>	TK_READ, TK_WRITE	TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN, TK_ENDIF, TK_ELSE, TK_ENDWHILE
<arithmeticExpression>	TK_OP, TK_ID, TK_NUM, TK_RNUM	TK_SEM, TK_CL
<addORsub>	TK_OP, TK_ID, TK_NUM, TK_RNUM	TK_SEM, TK_CL
<mulORdiv>	TK_OP, TK_ID, TK_NUM, TK_RNUM	TK_PLUS, TK_MINUS, TK_SEM, TK_CL
<brackets>	TK_OP, TK_ID, TK_NUM, TK_RNUM	TK_MUL, TK_DIV, TK_PLUS, TK_MINUS, TK_SEM, TK_CL
<MULDIV>	TK_MUL, TK_DIV	TK_OP, TK_ID, TK_NUM, TK_RNUM
<ADDSUB>	TK_PLUS, TK_MINUS	TK_OP, TK_ID, TK_NUM, TK_RNUM
<booleanExpression>	TK_NOT, TK_OP, TK_ID, TK_NUM, TK_RNUM	TK_CL
<var>	TK_ID, TK_NUM, TK_RNUM	TK_CL, TK_SEM, TK_CL, TK_ADD, TK_SUB, TK_MUL, TK_DIV, TK_LT, TK_LE, TK_EQ, TK_GT, TK_GE, TK_NE
<logicalOp>	TK_AND, TK_OR	TK_OP
<relationalOp>	TK_LT, TK_LE, TK_EQ, TK_GT, TK_GE, TK_NE	TK_ID, TK_NUM, TK_RNUM
<returnStmt>	TK_RETURN	TK_END
<optionalReturn>	TK_SQL, epsilon	TK_SEM
<idList>	TK_ID	TK_SQR
<more_ids>	TK_COMMA, epsilon	TK_SQR
<definetypesmt>	TK_DEFINETYPE	TK_RECORD, TK_UNION, TK_DEFINETYPE, TK_TYPE, TK_ID, TK_WHILE, TK_IF, TK_READ, TK_WRITE, TK_SQL, TK_CALL, TK_RETURN
<A>	TK_RECORD, TK_UNION	TK_RUID