1. 词法分析

需要解析的关键词有(不区分大小写)：

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| DATABASE | DATABASES | TABLE | TABLES | SHOW | CREATE |
| DROP | USE | PRIMARY | KEY | NOT | NULL |
| INSERT | INTO | VALUES | DELETE | FROM | WHERE |
| UPDATE | SET | SELECT | IS | INT | VARCHAR |
| DESC  REFERENCES | INDEX | AND | DATE | FLOAT | FOREIGN |

IDENTIFIER: [A-Za-z][\_0-9A-Za-z]\*

VALUE\_INT: [0-9]+

VALUE\_STRING: ’[^’]\*’

1. 语法分析

文法规则：

<program> := %empty

| <program><stmt>

<stmt> := <sysStmt>’;’

| <dbStmt>’;’

| <tbStmt>’;’

| <idxStmt>’;’

<sysStmt> := SHOW DATABASES

<dbStmt> := CREATE DATABASE <dbName>

| DROP DATABASE <dbName>

| USE <dbName>

| SHOW TABLES

<tbStmt> := CREATE TABLE <tbName> ’(’<fieldList>’)’

| DROP TABLE <tbName>

| DESC <tbName>

| INSERT INTO <tbName> VALUES <valueLists>

| DELETE FROM <tbName> WHERE <whereClause>

| UPDATE <tbName> SET <setClause> WHERE <whereClause>

| SELECT <selector> FROM <tableList> WHERE <whereClause>

<idxStmt> := CREATE INDEX <tbName>’ (’<colName>’) ’

| DROP INDEX <tbName>’ (’<colName>’) ’

<fieldList> := <field>

| <fieldList>’,’<field>

<field> := <colName> <type>

| <colName> <type> NOT NULL

| PRIMARY KEY ’(’<columnList>’)’

| FOREIGN KEY ’(’<colName>’)’ REFERENCES <tbName>’(’<colName>’)’

<type> := INT (<VALUE\_INT>)

| VARCHAR (<VALUE\_INT>)

| DATE

| FLOAT

<valueLists> := ’(’<valueList>’)’

| <valueLists>’, ’ ’ (’<valueList>’) ’

<valueList> := <value>

| <valueList>’, ’<value>

<value> := VALUE\_INT

| VALUE\_STRING

| NULL

<whereClause> := <col><op><expr>

| <col> IS [NOT] NULL

| <whereClause> AND <whereClause>

<col> := [<tbName>’.’]<colName>

<op> := ‘=’ | ‘<>’ | ‘<=’ | ‘>=’ | ‘<’ | ‘>’

<expr> := <value>

| <col>

<setClause> := <colName>’=’<value>

| <setClause>’, ’<colName>’=’<value>

<selector> := \* | <col>[,<col>]\*

<tableList> := <tbName>

| <tableList>’,’<tbName>

<columnList> := <colName>

| <columnList>’,’<colName>

<dbName> := IDENTIFIER

<tbName> := IDENTIFIER

<colName> := IDENTIFIER