

PARSER PROJECT

SQL : CREATE VIEW

M.C.A - 4th Semester

Department Of Computer Science

University Of Delhi

Submitted By-

Nimish Nailwal - 31

Shivam Gangwar - 53

Under the guidance of:-

Dr. Ankit Rajpal

CONTENTS

S NO.	TOPICS	Page No.
1	Overview	3
2	Syntax Create View	4
3	Assumptions	7
4	Test Cases	9
5	Areas Of Improvement	20
6	References	20

OVERVIEW

- This project aims to build a Parser that can parse **SQL CREATE VIEW** statements using lex and yacc .
- Syntax of **SQL Create View** statement and the grammar which we are using are given.
- Some assumptions have been made by us which are given further to give a clearer view of the query which is passed to the parser.
- Test Cases for valid/invalid queries are given for checking the correctness of parser.

Create View

- In SQL, a view is a virtual table based on the result-set of an SQL statement.
- A view contains rows and columns, just like a real table. The fields in a view are fields from one or more real tables in the database.
- We can add SQL statements and functions to a view and present the data as if the data were coming from one single table.
- A view is created with the **Create View** statement.
- A view always shows up-to-date data! The database engine recreates the view, every time a user queries it.

Syntax:

1. For Single Table

```
Create view [view_name] as  
select [whole]/[selective Columns]/[aggregate functions]  
from [table_name]  
where [condition/conditions] {OPTIONAL}  
group by [single]/[multiple columns] {OPTIONAL}  
order by [column] asc/desc {OPTIONAL}  
;
```

- whole/selective columns/aggr functions - means we can provide either *,columns or sum,avg,count in the select statement.
- Group by - this clause is optional and is used for grouping values of a table it can or cannot be used with aggregate functions.
- Order by- this clause is also optional and is used for ordering data based on specific columns in either ascending or descending order.

Syntax:

2. For Multiple Table

```
Create view [view_name] as  
select [whole]/[selective Columns]/[aggregate functions]  
from [table1_name],[table2_name]  
where [condition/conditions] {OPTIONAL}  
group by [single]/[multiple columns] {OPTIONAL}  
order by [column] asc/desc {OPTIONAL}  
;
```

- whole/selective columns/aggr functions - means we can provide either *,columns or sum,avg,count in the select statement.
- Group by - this clause is optional and is used for grouping values of a table it can or cannot be used with aggregate functions.
- Order by- this clause is also optional and is used for ordering data based on specific columns in either ascending or descending order.

Assumptions

1. Case Sensitive letters

Query entered by user is not case sensitive it can be read as all upper case or all lower case or mixed case.

2. Naming Conventions

Table names and column names can be in a combination of letters [A-Z]/ [a-z] digits[0-9] and special character []

3. Operators Used

Operators which can be used are:-

1. Relational Operator {<,>,<>,<=,>=,!<,>}
2. Logical Operator {and/or/not}

4. Alias

Table name is referred as simple table name alias is not been used to refer single/multiple tables;

5. Group By

The having condition of group by cannot have aggregate functions.

6. Aggregate Functions

Aggregate functions allowed are sum,avg and count.

7. Joins

Only natural join is allowed no other type of joins are allowed.

Tables

STUDENT

S_Id	Sname	Course	Duration	DOB	CGPA
1	Nimish Nailwal	M.C.A	3	1999-05-01	9
2	Shivam Gangwar	M.C.A	3	1998-07-27	9
3	Yashasvi	M.C.A	3	1998-09-30	9
4	Mukul	M.Sc	2	1999-12-16	8
5	Rohini	M.Sc	2	1999-10-11	6
6	Kavita	M.Sc	2	1999-08-24	9
7	Shradha	M.Sc	2	2000-10-11	8

PARENT

S_Id	P_Id	Father_Name	Mother_Name
1	P_1	Kailash Chand	Renu Nailwal
3	P_3	Ravi	Hema
4	P_4	Saurabh Garg	Vidya
5	P_5	Mukesh Yadav	Rekha Yadav

Single Table Queries

1. Create an exact virtual copy of table STUDENT;

Create view v1 as select * from STUDENT;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select * from STUDENT;

***** VALID QUERY *****
```

2. Create a view of Student for all MCA student;

Create view v1 as select * from STUDENT where course="MCA";

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select * from STUDENT where course = "MCA";

***** VALID QUERY *****
```

3. Create a view of table Student of all students born after 1999;
Create view v1 as select * from STUDENT where DOB>=2000-01-01;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select * from student where DOB >= 2000-01-09;

***** VALID QUERY *****
```

4. Create a view of table Student with S_Id and Same;
Create view v1 as select S_id,Sname from Student;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select S_id , sname from Student;

***** VALID QUERY *****
```

5. Create a view of table Student with SID, S name, course whose duration is of two years;

Create view v1 as select SID, name, course from STUDENT where duration=2;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select S_id , sname ,course from Student where duration = 2;

***** VALID QUERY *****
```

6. Create a view of table Student with no. of Student in each course;

Create view v1 as select count(S_ID) from STUDENT group by course;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select count(S_id) from Student group by course;

***** VALID QUERY *****
```

7. Create a view of table Student with S_name,DOB in decreasing order of DOB;

Create view v1 as select S_name,DOB from STUDENT order by DOB desc;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select S_name, DOB from Student order by DOB desc;

***** VALID QUERY *****
```

8. Create a view of table Student with S_name,DOB in decreasing order of DOB;

Create view v1 as select S_name,DOB from STUDENT order by DOB;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select S_name, DOB from Student order by DOB;

***** VALID QUERY *****
```

9. Create a view of table Student with average percentage of each course.

Create view v1 as select course,avg(CGPA) from STUDENT group by course;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select course ,avg(CGPA) from STUDENT group by course;

***** VALID QUERY *****
```

10. Create a view of Student who have scored CGPA greater than 8 of same courses.

Create view v1 as select count(Sname),Course from STUDENT where CGPA>8 group by course;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select count(sname) , course from student where CGPA > 8 group by course;

***** VALID QUERY *****
```

Multiple Table Queries

11. Create a view with records of both Student and Parent.

Create view v1 as select * from STUDENT , PARENT;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a
enter the query
create view v1 as select * from student , parent;

***** VALID QUERY *****
```

12. Create a view with records of both Student and Parent with valid match.

Create view v1 as select * from STUDENT NATURAL JOIN PARENT ;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select * from student natural join parent;

***** VALID QUERY *****
```

13. Create a view with sname,course of those student who have data in Parents table.

Create view v1 as select S_name,course from STUDENT NATURAL JOIN PARENT ;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select S_name, course from student natural join parent;

***** VALID QUERY *****
```

14. Create a view with records of Parents whose children have scored cgpa more than 8.

Create view v1 as select P_id,fathername,mothername from STUDENT NATURAL JOIN PARENT where cgpa>8 ;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select P_id, fathername, mothername from student natural join parent where cgpa > 8;

***** VALID QUERY *****
```

15. Create a view with records of Parents whose child is pursuing MSc.

Create view v1 as select P_id,fathername,mothername from STUDENT NATURAL JOIN PARENT where course=“MSc” ;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 as select P_id, fathername, mothername from student natural join parent where course = "MSC";

***** VALID QUERY *****
```

Invalid Queries

Typo Error

Create view v1 as Select * frm student;

Create view v1 as Select s_name,course from student whare course="MCA";

Create view v1 as Select * from student order by name descending;

Creation view v1 as select * from student;

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view V1 as select * frm student;

***** INVALID QUERY *****

PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view V1 as select s_name,course from student whare course = "M.C.A";

***** INVALID QUERY *****

PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view V1 as select * from student order by name descending;

***** INVALID QUERY *****

PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
creation view V1 as select * from student;

***** INVALID QUERY *****
```

Invalid Syntax

Create view v1 select * from student;

Create v1 as select * from student;

Create view v1 as select name, course student ;

Create view v1 as select name, course from student where course="MCA"

```
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 select * from student;
```

```
***** INVALID QUERY *****
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create v1 as select * from student;
```

```
***** INVALID QUERY *****
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 select name, course student;
```

```
***** INVALID QUERY *****
PS C:\Users\shiva\Desktop\sem4\compiler design\project> .\a.exe
enter the query
create view v1 select name, course student where course = "MCA"
```

```
***** INVALID QUERY *****
```

Areas of Improvement

- More aggregate function can be consider like max,min, concat, pow etc.
- We can use other types of join like left, right, outer,equi etc
- Can include more nested queries.

References

- https://www.w3schools.com/sql/sql_view.asp
- https://www.w3schools.com/sql/sql_join.asp
- <https://faun.pub/introduction-to-lex-and-yacc-b9bafab67447>
- <https://karkare.github.io/cs335/lectures/04LexicalAanalysis.pdf>