

System Programming Project

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Topic: Parser for SQL: **Select** Statement (**without** nesting): **No Joining**

The SQL Select statement:

The SELECT statement is used to select data from a database.

The data returned is stored in a result table, called the result-set.

Select Syntax:

```
SELECT column1,column2,...  
FROM table_name;
```

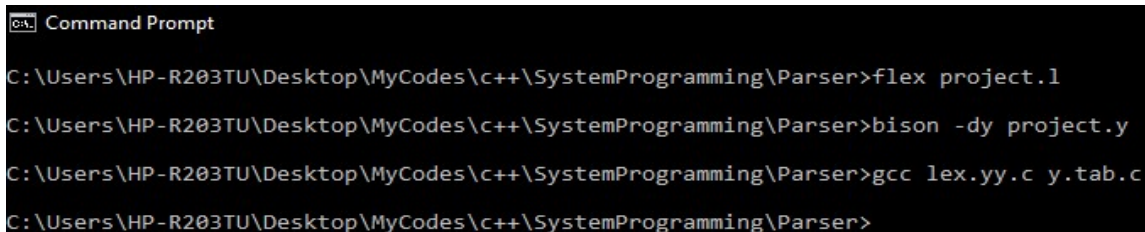
Here, column1, column2, ... are the field names of the table you want to select data from. If you want to select all the fields available in the table, use the following syntax:

```
SELECT * FROM table_name;
```

NOTE: This parser has not been designed for syntactical analysis of nested SELECT queries. Moreover, the parser also does NOT parse SELECT statements with JOIN clause.

***Only lowercase SQL keywords(SELECT, FROM, WHERE etc.) have been handled.**

COMPILATION PROCESS:



```
Command Prompt  
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>flex project.l  
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>bison -dy project.y  
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>gcc lex.yy.c y.tab.c  
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```

Situations which the parser handles appropriately:

1.Simple Basic SELECT statement-

- > select column from table;
- > select c1,c2 from table;
- > select * from table;

```
Command Prompt
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select column from table;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select c1,c2 from table;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
```

2. SELECT DISTINCT statement-

- > select distinct col1,col2
from tablename;

```
Command Prompt
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select distinct col1,col2
from tablename;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
```

3. SELECT with WHERE CLAUSE-

- > select column1 from table where id=1;

```
Command Prompt
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select column1 from table2
where id=1;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```

- > select * from table
where id >= 2;
- > select columns from table where age < 18;
- > select * from table where age > 18 and id <= 10;

```
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table
where id >=2;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select columns from table where age < 18;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where age > 18 and id <= 10;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
```

4. SELECT with AND, OR and LIKE operators-

- > select * from table where c1 = 2 and c2 != 0;
- > select * from table where c1 = 0 or c1 = 1;
- > select * from table where c1 like condition1;

```
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where c1 = 2 and c2 != 0;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where c1 = 0 or c1 = 1;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where c1 like condition1;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```

5. SELECT ORDER BY keyword-

- > select * from table order by id;
- > select * from table order by name asc;
- > select * from table order by id desc;

```
Command Prompt

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table order by id;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table order by name asc;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table order by age desc;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```

6. SQL GROUP BY statement-

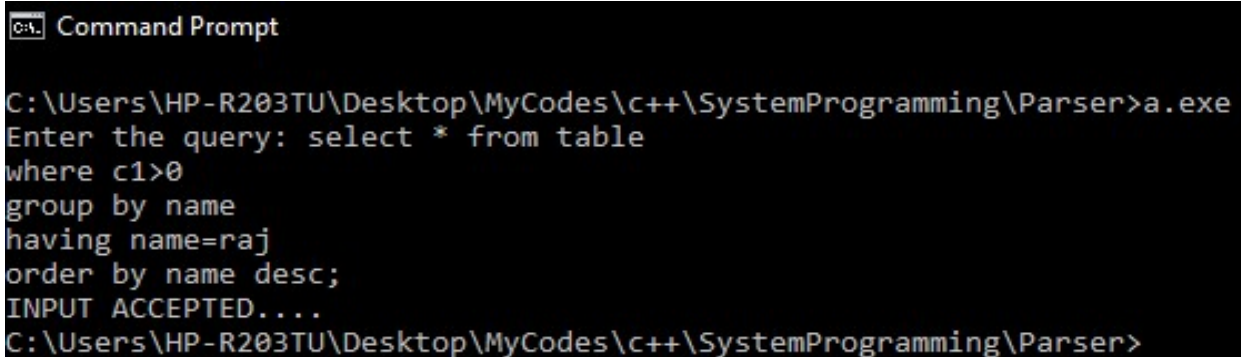
- > select * from table where id = 1 group by name;
- > select * from table where age > 18
group by age
order by age desc;

```
Command Prompt

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where id=1
group by name;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table where age>18
group by age
order by age desc;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```


7. SQL HAVING clause-

-> select * from table
where c1>0
group by name
having name=raj
order by name desc;



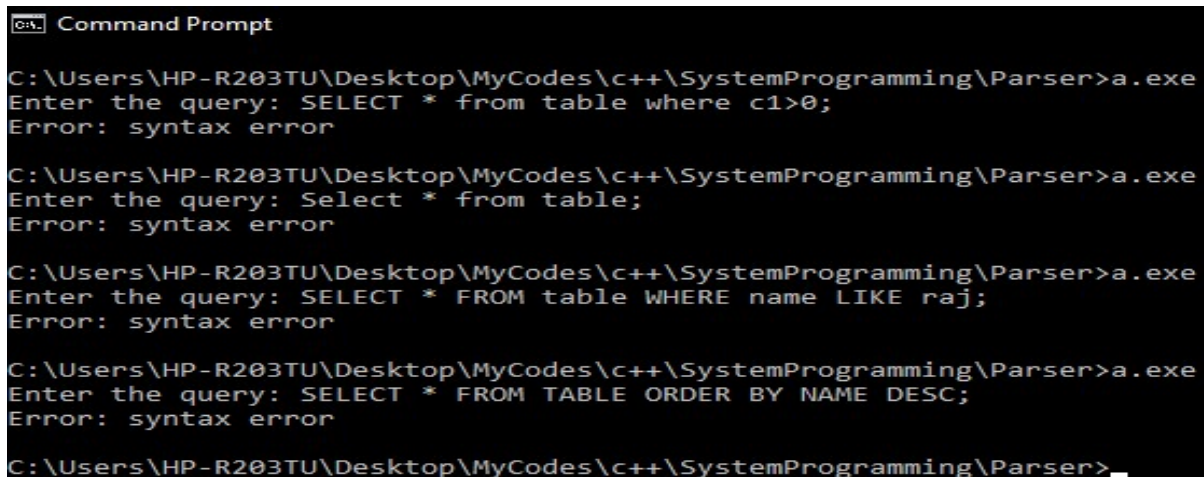
```
Command Prompt

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select * from table
where c1>0
group by name
having name=raj
order by name desc;
INPUT ACCEPTED....
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>
```

Situations in which the parser fails/may fail:

1. Though SQL is case insensitive, this parser works only for lowercase keywords and fails in any other case, even if the query is syntactically correct.

-> SELECT * from table where c1>0;
-> Select * from table;
-> SELECT * FROM table where name like raj;
-> SELECT * FROM TABLE ORDER BY NAME DESC;



```
Command Prompt

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: SELECT * from table where c1>0;
Error: syntax error

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: Select * from table;
Error: syntax error

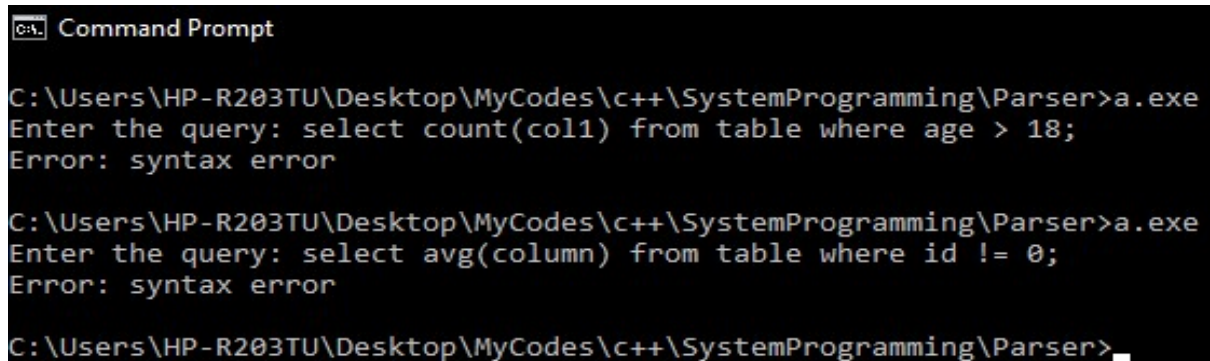
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: SELECT * FROM table WHERE name LIKE raj;
Error: syntax error

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: SELECT * FROM TABLE ORDER BY NAME DESC;
Error: syntax error

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
```

2. If any sql keyword other than those used in the lexical file are given as input-

-> select count(col1)
from table
where age > 18;
-> select avg(column)
from table
where id != 0;



```
C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select count(col1) from table where age > 18;
Error: syntax error

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>a.exe
Enter the query: select avg(column) from table where id != 0;
Error: syntax error

C:\Users\HP-R203TU\Desktop\MyCodes\c++\SystemProgramming\Parser>_
```

3. If the query syntax rules varies amongst different database management systems!!

*****EOF*****