

**State University of New York at New Paltz**

**VYSALI DEVABHAKTUNI**

**su23-05**

**REPORT for PROJECT # 01**

(MySQL and Basic SQL)

**CPS593-01 “Database Management Systems”**

**(Professor Hanh Pham)**

**Summer 2023**

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## Business Scenario

A certain search engine wants to update the CEO's of the organizations in it's database. It stores the data about the organizations in tables that contains the establishment year, organization name and the CEO of the organization. We can add or remove or update a record and also add attributes such as Birth year of the CEOs.

Based on these business requirements, we decided to store the data in table and name it as 'COMPANY':

ESTABLISHMENT	ORGANIZATION	CEO
1865	NOKIA	RAJEEV SURE
1975	MICROSOFT	SATYA NADENDLA
1998	GOOGLE	SUNDAR PICHAI
1999	ALIBABA GROUP	DANIEL ZHANG
2008	HACKERRANK	VIVEK RAVISANKAR

**STEP-1:** **SHOW** what databases you have now in a DBMS

```
mysql> SHOW DATABASES;
```

```
devabhav1@wyvern:~  
login as:  
login as: devabhav1  
devabhav1@wyvern.cs.newpaltz.edu's password:  
Welcome to the Computer Science Linux Lab (on wyvern).  
  
Academic Computing Linux Support Contact: help@cs.newpaltz.edu  
  
Remote access instructions and other tips can be found in the  
SUNY New Paltz ITS Knowledge Base:  
  
https://newpaltz.teamdynamix.com/TDClient/KB/?CategoryID=4215  
  
If there are any concerns about this server, please send an  
e-mail message to help@cs.newpaltz.edu with a description of  
the problem.  
  
---  
  
Last login: Wed Jun 14 11:35:20 2023 from 49.43.219.119  
[devabhav1@wyvern ~]$ mysql -h localhost -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 1569  
Server version: 10.5.16-MariaDB MariaDB Server  
  
copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
  
MariaDB [(none)]> CREATE DATABASE devabhav1_db;  
ERROR 1007 (HY000): Can't create database 'devabhav1_db'; database exists  
MariaDB [(none)]> SHOW DATABASES;  
+-----+  
| Database |  
+-----+  
| devabhav1_db |  
| information_schema |  
+-----+  
2 rows in set (0.001 sec)  
  
MariaDB [(none)]>
```

STEP-2: **USE** (choose) a database to work with:

```
mysql> USE devabhav1_db;
```

```
devabhav1@wyvern:~
Remote access instructions and other tips can be found in the
SUNY New Paltz ITS Knowledge Base:

https://newpaltz.teamdynamix.com/TDClient/KB/?CategoryID=4215

If there are any concerns about this server, please send an
e-mail message to help@cs.newpaltz.edu with a description of
the problem.

---

Last login: Wed Jun 14 11:35:20 2023 from 49.43.219.119
[devabhav1@wyvern ~]$ mysql -h localhost -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1569
Server version: 10.5.16-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE devabhav1_db;
ERROR 1007 (HY000): Can't create database 'devabhav1_db'; database exists
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| devabhav1_db |
| information_schema |
+-----+
2 rows in set (0.001 sec)

MariaDB [(none)]> USE devabhav1_db;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
```

STEP-3: **CREATE** a new table.

We will need to have/create a table named Company which has the initial contents given in business scenario. The SQL statements to define the table Company and then insert/enter the data are:

```
CREATE TABLE COMPANY (  
ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,  
ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,CEO CHAR(20) DEFAULT ''  
NOT NULL, PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
```

## INSERT INTO COMPANY VALUES

(1865,'NOKIA','RAJEEV SURE'),(1975,'MICROSOFT','SATYA NADENDLA'),(1998,'GOOGLE','SUNDAR PICHAI'),(1999,'ALIBABA GROUP','DANIEL ZHANG'),(2008,'HACKERRANK','VIVEK RAVISANKAR');

```
devabhav1@wyvern:~$ mysql
Last login: Wed Jun 14 11:46:26 2023 from 49.41.219.119
[devabhav1@wyvern ~]$ mysql -h localhost -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1576
Server version: 10.5.16-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE devabhav1_db;
ERROR 1007 (HY000): Can't create database 'devabhav1_db': database exists
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| devabhav1_db |
| information_schema |
+-----+
2 rows in set (0.003 sec)

MariaDB [(none)]> USE devabhav1_db;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [devabhav1_db]> CREATE TABLE COMPANIES (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
ERROR 1050 (42S01): Table 'COMPANIES' already exists
MariaDB [devabhav1_db]> CREATE TABLE COMPANY (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
Query OK, 0 rows affected (0.006 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY VALUES
  -> (1865,'NOKIA','RAJEEV SURI'),(1975,'MICROSOFT','SATYA NADENDLA'),(1998,'GOOGLE','SUNDAR PICHAI'),(1999,'ALIBABA GROUP','DANIEL ZHANG'),(2008,'HACKERRANK','VIVEK RAVISANKAR');
Query OK, 5 rows affected (0.002 sec)
Records: 5 Duplicates: 0 Warnings: 0

MariaDB [devabhav1_db]>
```

**STEP-4:** **SEE** the contents of a table using SELECT:

**mysql> SELECT \* FROM COMPANY ;**

```
devabhav1@wyvern:~$ mysql
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE devabhav1_db;
ERROR 1007 (HY000): Can't create database 'devabhav1_db': database exists
MariaDB [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| devabhav1_db |
| information_schema |
+-----+
2 rows in set (0.003 sec)

MariaDB [(none)]> USE devabhav1_db;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [devabhav1_db]> CREATE TABLE COMPANIES (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
ERROR 1050 (42S01): Table 'COMPANIES' already exists
MariaDB [devabhav1_db]> CREATE TABLE COMPANY (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
Query OK, 0 rows affected (0.006 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY VALUES
  -> (1865,'NOKIA','RAJEEV SURI'),(1975,'MICROSOFT','SATYA NADENDLA'),(1998,'GOOGLE','SUNDAR PICHAI'),(1999,'ALIBABA GROUP','DANIEL ZHANG'),(2008,'HACKERRANK','VIVEK RAVISANKAR');
Query OK, 5 rows affected (0.002 sec)
Records: 5 Duplicates: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1975 | MICROSOFT | SATYA NADENDLA |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]>
```

**STEP-5: INSERT** (add) a new ROW/RECORD into a table:

**INSERT INTO COMPANY (ESTABLISHMENT, ORGANIZATION, CEO)  
VALUES (1869,'THE GOLDMAN SACHS', 'DAVID M.SOLOMON');**

```
devabhav1@wyvern:~
+-----+
| Database |
+-----+
| devabhav1_db |
| information_schema |
+-----+
2 rows in set (0.003 sec)

MariaDB [(none)]> USE devabhav1_db;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [devabhav1_db]> CREATE TABLE COMPANIES (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
ERROR 1050 (42S01): Table 'COMPANIES' already exists
MariaDB [devabhav1_db]> CREATE TABLE COMPANY (
  -> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
  -> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
  -> CEO CHAR(20) DEFAULT '' NOT NULL,
  -> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
Query OK, 0 rows affected (0.006 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY VALUES
  -> (1865,'NOKIA','RAJEEV SURI'),(1975,'MICROSOFT','SATYA NADENDLA'),(1998,'GOOGLE','SUNDAR PICHAI'),(1999,'ALIBABA GROUP','DANIEL ZHANG'),(2008,'HACKERRANK','VIVEK RAVISANKAR');
Query OK, 5 rows affected (0.002 sec)
Records: 5 Duplicates: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1975 | MICROSOFT | SATYA NADENDLA |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY
  -> (ESTABLISHMENT, ORGANIZATION, CEO)
  -> VALUES (1869, 'THE GOLDMAN SACHS', 'DAVID M.SOLOMON');
Query OK, 1 row affected (0.002 sec)

MariaDB [devabhav1_db]>
```

**STEP-6: DELETE** (remove) a ROW/RECORD from a table:

**DELETE FROM COMPANY  
WHERE ORGANIZATION = 'MICROSOFT';**

```

devabhav1@wyvern:~
-> CEO CHAR(20) DEFAULT '' NOT NULL,
-> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
ERROR 1050 (42S01): Table 'COMPANIES' already exists
MariaDB [devabhav1_db]> CREATE TABLE COMPANY (
-> ESTABLISHMENT INT(4) UNSIGNED ZEROFILL DEFAULT '0000' NOT NULL,
-> ORGANIZATION CHAR(20) DEFAULT '' NOT NULL,
-> CEO CHAR(20) DEFAULT '' NOT NULL,
-> PRIMARY KEY(ESTABLISHMENT, ORGANIZATION));
Query OK, 0 rows affected (0.006 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY VALUES
-> (1865,'NOKIA','RAJEEV SURI'),(1975,'MICROSOFT','SATYA NADENDLA'),(1998,'GOOGLE','SUNDAR PICHAI'),(1999,'ALIBABA GROUP','DANIEL ZHANG'),(2008,'HACKERRANK','VIVEK RAVISANKAR');
Query OK, 5 rows affected (0.002 sec)
Records: 5 Duplicates: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1975 | MICROSOFT | SATYA NADENDLA |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY
-> (ESTABLISHMENT, ORGANIZATION, CEO)
-> VALUES (1869, 'THE GOLDMAN SACHS', 'DAVID M.SOLOMON');
Query OK, 1 row affected (0.002 sec)

MariaDB [devabhav1_db]> DELETE FROM COMPANY
-> WHERE ORGANIZATION = 'MICROSOFT';
Query OK, 1 row affected (0.003 sec)

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [devabhav1_db]>

```

**STEP-7: UPDATE** (change VALUES of) a whole ROW/RECORD in a table:

**UPDATE COMPANY**

**SET CEO = 'SATYA NADENDLA'**

**WHERE ORGANIZATION = 'MICROSOFT';**

```

devabhav1@wyvern:~
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1975 | MICROSOFT | SATYA NADENDLA |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]> INSERT INTO COMPANY
-> (ESTABLISHMENT, ORGANIZATION, CEO)
-> VALUES (1869, 'THE GOLDMAN SACHS', 'DAVID M.SOLOMON');
Query OK, 1 row affected (0.002 sec)

MariaDB [devabhav1_db]> DELETE FROM COMPANY
-> WHERE ORGANIZATION = 'MICROSOFT';
Query OK, 1 row affected (0.003 sec)

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [devabhav1_db]> UPDATE COMPANY
-> SET CEO = 'SATYA NADENDLA'
-> WHERE ORGANIZATION = 'MICROSOFT';
Query OK, 0 rows affected (0.001 sec)
Rows matched: 0 Changed: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]>

```

**STEP-8:** **ADD** a new COLUMN into a table

**ALTER TABLE COMPANY**  
**ADD BIRTH\_YEAR INT(4);**

```
devabhav1@wyvern:~$ mariadb -u root -h localhost -P 3306
MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [devabhav1_db]> UPDATE COMPANY
-> SET CEO = 'SATYA NADENDLA'
-> WHERE ORGANIZATION = 'MICROSOFT';
Query OK, 0 rows affected (0.001 sec)
Rows matched: 0 Changed: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO |
+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |
| 1998 | GOOGLE | SUNDAR PICHAI |
| 1999 | ALIBABA GROUP | DANIEL ZHANG |
| 2008 | HACKERRANK | VIVEK RAVISANKAR |
+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]> ALTER TABLE COMPANY
-> ADD BIRTH_YEAR INT(4);
Query OK, 0 rows affected (0.004 sec)
Records: 0 Duplicates: 0 Warnings: 0

MariaDB [devabhav1_db]> SELECT * FROM COMPANY;
+-----+-----+-----+-----+
| ESTABLISHMENT | ORGANIZATION | CEO | BIRTH_YEAR |
+-----+-----+-----+-----+
| 1865 | NOKIA | RAJEEV SURI | NULL |
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON | NULL |
| 1998 | GOOGLE | SUNDAR PICHAI | NULL |
| 1999 | ALIBABA GROUP | DANIEL ZHANG | NULL |
| 2008 | HACKERRANK | VIVEK RAVISANKAR | NULL |
+-----+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [devabhav1_db]>
```

**STEP-9:** **UPDATE** (change VALUES of) a whole COLUMN in a table:

**UPDATE COMPANY**  
**SET BIRTH\_YEAR = 1975;**



```
devabhav1@wyvern:~  
+-----+  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |  
| 1998 | GOOGLE | SUNDAR PICHAI |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR |  
+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> ALTER TABLE COMPANY  
-> ADD BIRTH_YEAR INT(4);  
Query OK, 0 rows affected (0.004 sec)  
Records: 0 Duplicates: 0 Warnings: 0  
  
MariaDB [devabhav1_db]> SELECT * FROM COMPANY;  
+-----+  
| ESTABLISHMENT | ORGANIZATION | CEO | BIRTH_YEAR |  
+-----+  
| 1865 | NOKIA | RAJEEV SURI | NULL |  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON | NULL |  
| 1998 | GOOGLE | SUNDAR PICHAI | NULL |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG | NULL |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR | NULL |  
+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> UPDATE COMPANY  
-> SET YEAR = 1975;  
ERROR 1054 (42S22): Unknown column 'YEAR' in 'field list'  
MariaDB [devabhav1_db]> UPDAT COMPANY  
-> SET BIRTH_YEAR = 1975;  
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'UPDAT COMPANY  
SET BIRTH_YEAR = 1975' at line 1  
MariaDB [devabhav1_db]> UPDATE COMPANY  
-> SET BIRTH_YEAR = 1975;  
Query OK, 5 rows affected (0.003 sec)  
Rows matched: 5 Changed: 5 Warnings: 0  
  
MariaDB [devabhav1_db]> SELECT * FROM COMPANY;  
+-----+  
| ESTABLISHMENT | ORGANIZATION | CEO | BIRTH_YEAR |  
+-----+  
| 1865 | NOKIA | RAJEEV SURI | 1975 |  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON | 1975 |  
| 1998 | GOOGLE | SUNDAR PICHAI | 1975 |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG | 1975 |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR | 1975 |  
+-----+  
5 rows in set (0.000 sec)  
  
MariaDB [devabhav1_db]>
```

**STEP-10: DELETE a COLUMN in a table:**  
**ALTER TABLE COMPANY**  
**DROP COLUMN BIRTH\_YEAR;**

```
devabhav1@wyvern:~  
+-----+  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON | NULL |  
| 1998 | GOOGLE | SUNDAR PICHAI | NULL |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG | NULL |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR | NULL |  
+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> UPDATE COMPANY  
-> SET YEAR = 1975;  
ERROR 1054 (42S22): Unknown column 'YEAR' in 'field list'  
MariaDB [devabhav1_db]> UPDAT COMPANY  
-> SET BIRTH_YEAR = 1975;  
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right syntax to use near 'UPDAT COMPANY  
SET BIRTH_YEAR = 1975' at line 1  
MariaDB [devabhav1_db]> UPDATE COMPANY  
-> SET BIRTH_YEAR = 1975;  
Query OK, 5 rows affected (0.003 sec)  
Rows matched: 5 Changed: 5 Warnings: 0  
  
MariaDB [devabhav1_db]> SELECT * FROM COMPANY;  
+-----+  
| ESTABLISHMENT | ORGANIZATION | CEO | BIRTH_YEAR |  
+-----+  
| 1865 | NOKIA | RAJEEV SURI | 1975 |  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON | 1975 |  
| 1998 | GOOGLE | SUNDAR PICHAI | 1975 |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG | 1975 |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR | 1975 |  
+-----+  
5 rows in set (0.000 sec)  
  
MariaDB [devabhav1_db]> ALTER TABLE COMPANY  
-> DROP COLUMN BIRTH_YEAR;  
Query OK, 0 rows affected (0.003 sec)  
Records: 0 Duplicates: 0 Warnings: 0  
  
MariaDB [devabhav1_db]> SELECT * FROM COMPANY;  
+-----+  
| ESTABLISHMENT | ORGANIZATION | CEO |  
+-----+  
| 1865 | NOKIA | RAJEEV SURI |  
| 1869 | THE GOLDMAN SACHS | DAVID M.SOLOMON |  
| 1998 | GOOGLE | SUNDAR PICHAI |  
| 1999 | ALIBABA GROUP | DANIEL ZHANG |  
| 2008 | HACKERRANK | VIVEK RAVISANKAR |  
+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]>
```

# **State University of New York at New Paltz**

**Vysali Devabhaktuni**

**su23-05**

## **REPORT for PROJECT # 02**

**(Advanced SQL)**

**CPS593-01 “Database Management Systems”**

**(Professor Hanh Pham)**

**Summer 2023**

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**Business Situation:**

A certain search engine wants to update rank of the organizations in it's database based on it's net worth(in billions). It stores the data about the organizations in tables that contains the rank, organization name and the net worth of the organization. We can make a copy, delete the table or sort it out based on the clause.

Based on these business requirements, we decided to store the data in table and name it as 'WORTH':

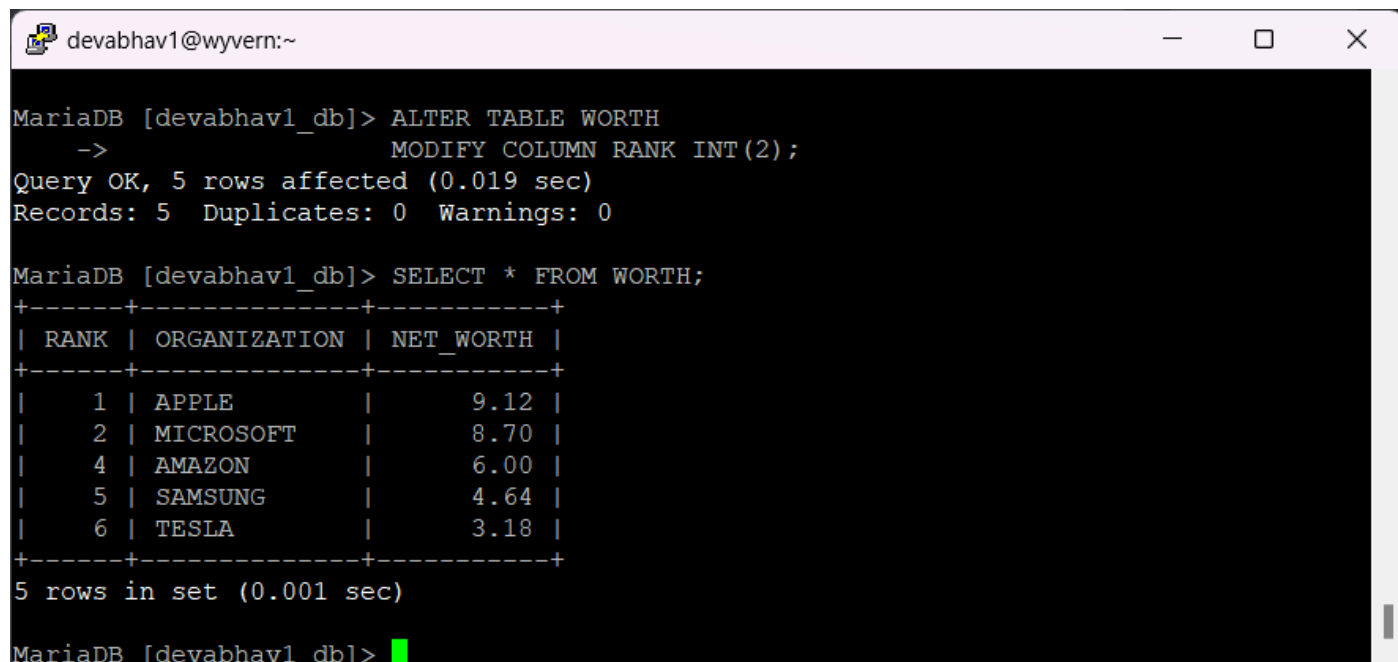
RANK	ORGANIZATION	NET_WORTH
0001	APPLE	9.12
0002	MICROSOFT	8.70
0003	GOOGLE	7.12
0004	AMAZON	6.54
0005	SAMSUNG	4.64

**STEP-1:** **CHANGE** the **data type** of a **COLUMN** in a table.

**SYNTAX:**

```
mysql> Alter table WORTH modify column RANK int(2);
```

After that the table **WORTH** looks like:



```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> ALTER TABLE WORTH  
-> MODIFY COLUMN RANK INT(2);  
Query OK, 5 rows affected (0.019 sec)  
Records: 5 Duplicates: 0 Warnings: 0  
  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1 db]>
```

**STEP-2:** **GET/Retrieve** particular data using a keyword (with WHERE ... = "keyword";)

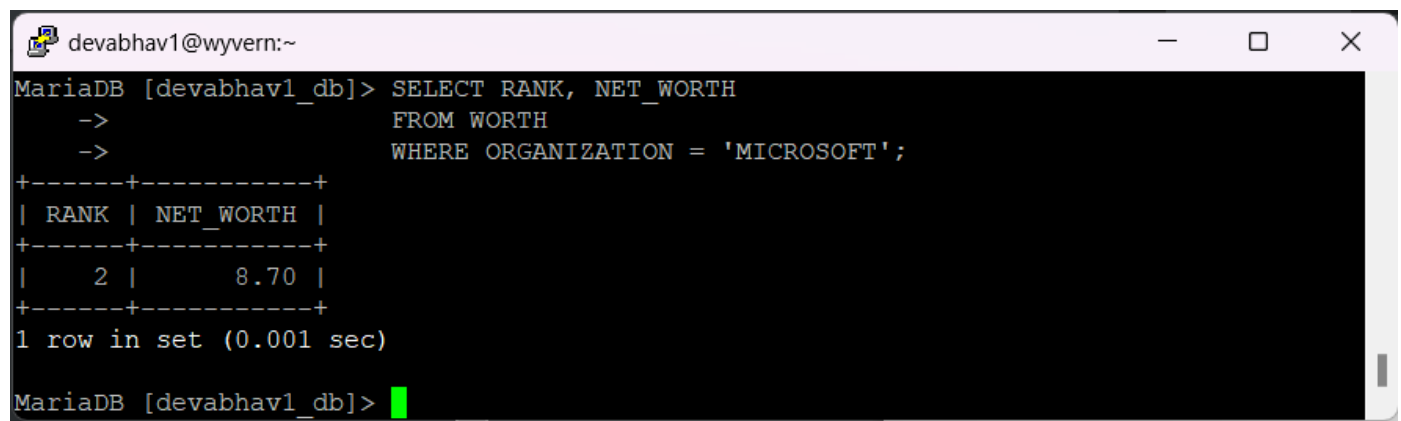
**SYNTAX:**

```
mysql> SELECT "column1" [, "column2", etc] FROM "tablename"  
WHERE "condition";
```

**EXAMPLE 1:**

```
mysql> Select RANK, NET_WORTH from WORTH where  
ORGANIZATION = 'MICROSOFT';
```

After that the output of this query (doesn't mean the contents of the table **WORTH**) will look like this:



The screenshot shows a terminal window with the prompt 'devabhav1@wyvern:~'. Inside the terminal, a MySQL query is executed: 'MariaDB [devabhav1\_db]> SELECT RANK, NET\_WORTH FROM WORTH WHERE ORGANIZATION = 'MICROSOFT';'. The output is displayed in a table format with columns 'RANK' and 'NET\_WORTH'. The first row shows '2' for RANK and '8.70' for NET\_WORTH. Below the table, it says '1 row in set (0.001 sec)'. The prompt 'MariaDB [devabhav1\_db]>' is visible at the bottom of the terminal window.

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT RANK, NET_WORTH  
-> FROM WORTH  
-> WHERE ORGANIZATION = 'MICROSOFT';  
+-----+-----+  
| RANK | NET_WORTH |  
+-----+-----+  
| 2 | 8.70 |  
+-----+-----+  
1 row in set (0.001 sec)  
MariaDB [devabhav1_db]>
```

**EXAMPLE 2:**

```
mysql> Select RANK, ORGANIZATION from WORTH where NET_WORTH > 5  
and NET_WORTH < 10;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT RANK, ORGANIZATION  
-> FROM WORTH  
-> WHERE NET_WORTH >5 AND NET_WORTH < 10;  
+-----+-----+  
| RANK | ORGANIZATION |  
+-----+-----+  
| 1 | APPLE |  
| 2 | MICROSOFT |  
| 4 | AMAZON |  
+-----+-----+  
3 rows in set (0.001 sec)  
MariaDB [devabhav1_db]>
```

**STEP-3: Make a COPY** of a table;

**SYNTAX:**

The syntax for copying all of the columns of a table into another table is:

```
mysql>Create table new_table AS (SELECT * FROM old_table);
```

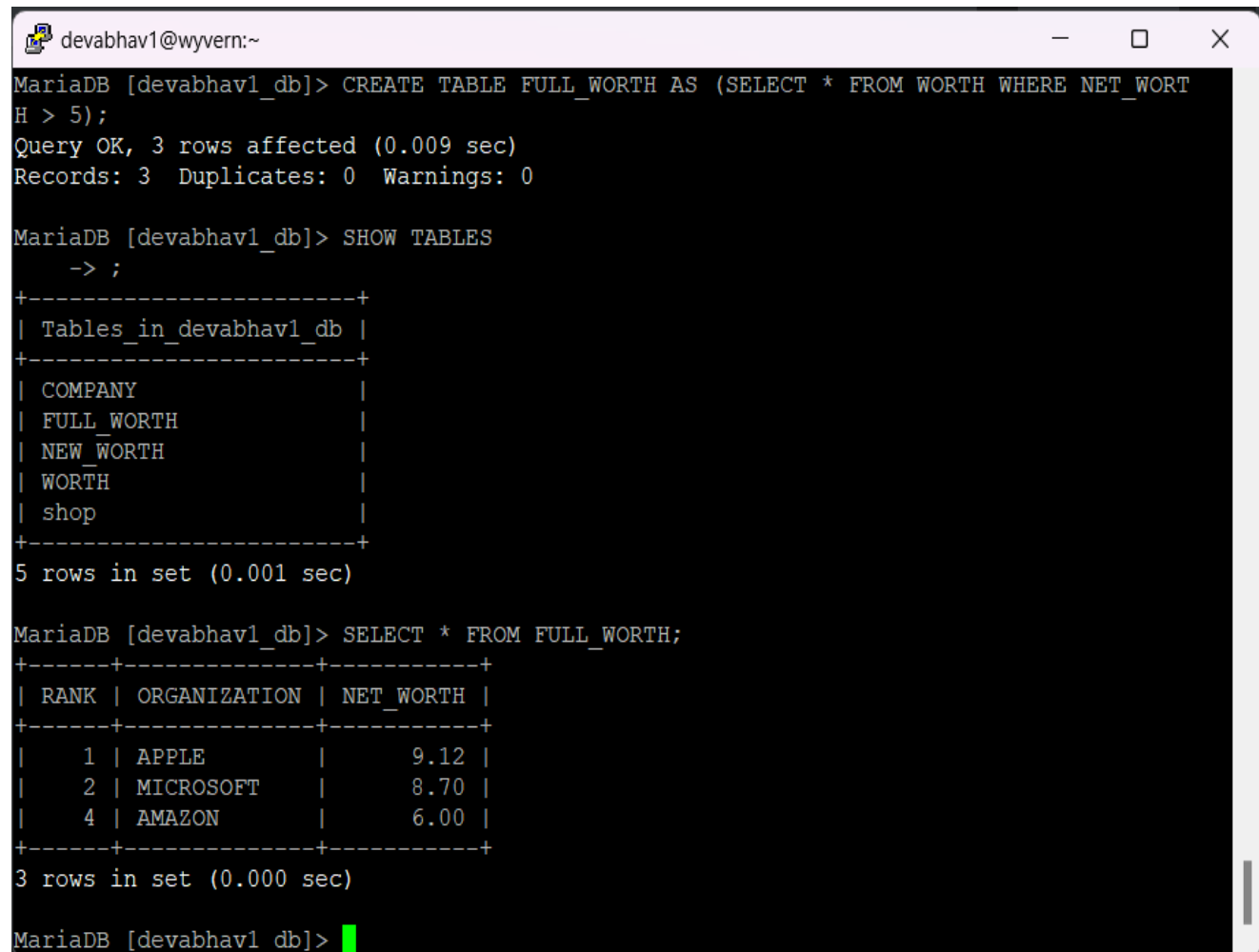
**EXAMPLE 1:**

```
mysql>Create table NEW_WORTH AS (SELECT * FROM WORTH);
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> CREATE TABLE NEW_WORTH AS (SELECT * FROM WORTH);  
Query OK, 5 rows affected (0.007 sec)  
Records: 5 Duplicates: 0 Warnings: 0  
  
MariaDB [devabhav1_db]> SHOW TABLES;  
+-----+  
| Tables_in_devabhav1_db |  
+-----+  
| COMPANY |  
| NEW_WORTH |  
| WORTH |  
| shop |  
+-----+  
4 rows in set (0.000 sec)  
  
MariaDB [devabhav1_db]> SELECT * FROM NEW_WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.001 sec)  
MariaDB [devabhav1_db]>
```

## EXAMPLE 2:

```
mysql> Create table FULL_WORTH AS (SELECT * FROM WORTH  
where NET_WORTH > 5);
```



The screenshot shows a terminal window with the following content:

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> CREATE TABLE FULL_WORTH AS (SELECT * FROM WORTH WHERE NET_WORTH  
H > 5);  
Query OK, 3 rows affected (0.009 sec)  
Records: 3  Duplicates: 0  Warnings: 0  
  
MariaDB [devabhav1_db]> SHOW TABLES  
-> ;  
+-----+  
| Tables_in_devabhav1_db |  
+-----+  
| COMPANY                |  
| FULL_WORTH              |  
| NEW_WORTH               |  
| WORTH                   |  
| shop                    |  
+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> SELECT * FROM FULL_WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1    | APPLE        | 9.12      |  
| 2    | MICROSOFT    | 8.70      |  
| 4    | AMAZON       | 6.00      |  
+-----+-----+-----+  
3 rows in set (0.000 sec)  
  
MariaDB [devabhav1 db]>
```

STEP-4: **DELETE** a table;

The syntax for the deleting a table is:

```
mysql> Drop table NEW_WORTH;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> DROP TABLE NEW_WORTH;  
Query OK, 0 rows affected (0.004 sec)  
  
MariaDB [devabhav1_db]> SHOW TABLES;  
+-----+  
| Tables_in_devabhav1_db |  
+-----+  
| COMPANY                |  
| FULL_WORTH              |  
| WORTH                   |  
| shop                    |  
+-----+  
4 rows in set (0.002 sec)  
  
MariaDB [devabhav1_db]> 
```

**STEP-5: FILTER and SORT** data from a table using **ORDER BY** clause

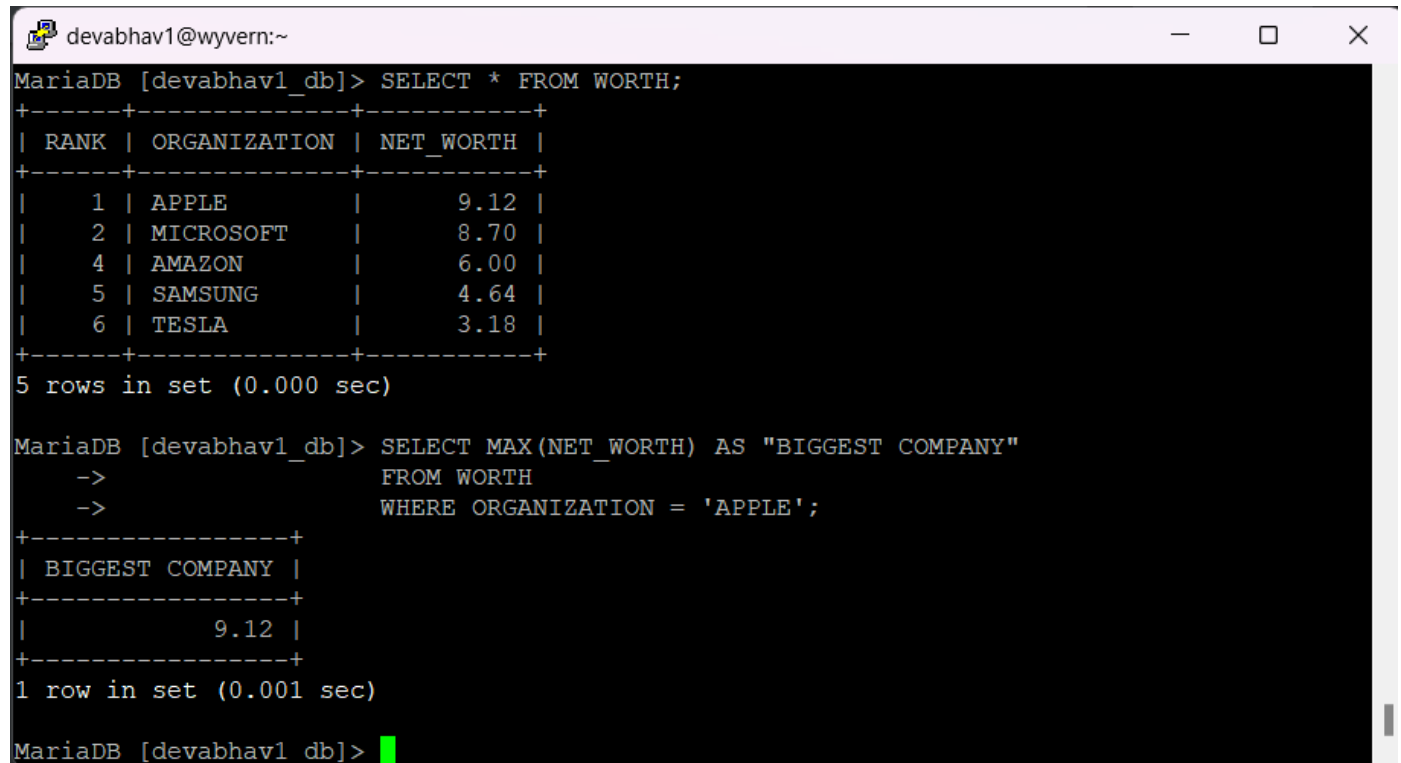
```
mysql> Select ORGANIZATION from WORTH where NET_WORTH > 5 order by  
ORGANIZATION asc;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1    | APPLE        | 9.12      |  
| 2    | MICROSOFT    | 8.70      |  
| 4    | AMAZON       | 6.00      |  
| 5    | SAMSUNG      | 4.64      |  
| 6    | TESLA        | 3.18      |  
+-----+-----+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> SELECT ORGANIZATION  
-> FROM WORTH  
-> WHERE NET_WORTH > 5  
-> ORDER BY ORGANIZATION ASC;  
+-----+  
| ORGANIZATION |  
+-----+  
| AMAZON       |  
| APPLE        |  
| MICROSOFT    |  
+-----+  
3 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> 
```



**STEP-6:** Use **SQL functions** to **get MAX, MIN, AVE ...** based on data from a table

```
mysql> Select max(NET_WORTH) as "BIGGEST COMPANY" from WORTH where  
ORGANIZATION = 'APPLE';
```



The screenshot shows a terminal window with the following content:

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.000 sec)  
  
MariaDB [devabhav1_db]> SELECT MAX(NET_WORTH) AS "BIGGEST COMPANY"  
-> FROM WORTH  
-> WHERE ORGANIZATION = 'APPLE';  
+-----+  
| BIGGEST COMPANY |  
+-----+  
| 9.12 |  
+-----+  
1 row in set (0.001 sec)  
  
MariaDB [devabhav1_db]>
```

**STEP-7:** Use **SQL function COUNT** to get define the size of data from a table

```
mysql> Select count(*) as "NUMBER OF COMPANIES" from WORTH  
where bookprice <80.0;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> SELECT COUNT(*) AS "NUMBER OF COMPANIES"  
-> FROM WORTH  
-> WHERE NET_WORTH > 1;  
+-----+  
| NUMBER OF COMPANIES |  
+-----+  
| 5 |  
+-----+  
1 row in set (0.000 sec)  
  
MariaDB [devabhav1_db]>
```

### STEP-8: Using **DISTINCT** clause

```
mysql> Select count(DISTINCT ORGANIZATION) as "UNIQUE  
COMPANIES" from WORTH where NET_WORTH > 6;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> SELECT COUNT(DISTINCT ORGANIZATION) AS "UNIQUE COMPANIES"  
-> FROM WORTH  
-> WHERE NET_WORTH > 6;  
+-----+  
| UNIQUE COMPANIES |  
+-----+  
| 2 |  
+-----+  
1 row in set (0.001 sec)  
  
MariaDB [devabhav1_db]>
```

STEP-9: Using **GROUP BY** clause

```
mysql> Select bookname, count(*) as "number of
books" from saivenkateshstore group by bookname;
```

```
devabhav1@wyvern:~
MariaDB [devabhav1_db]> SELECT * FROM WORTH;
+-----+-----+-----+
| RANK | ORGANIZATION | NET_WORTH |
+-----+-----+-----+
| 1 | APPLE | 9.12 |
| 2 | MICROSOFT | 8.70 |
| 4 | AMAZON | 6.00 |
| 5 | SAMSUNG | 4.64 |
| 6 | TESLA | 3.18 |
+-----+-----+-----+
5 rows in set (0.000 sec)

MariaDB [devabhav1_db]> SELECT ORGANIZATION, COUNT(*) AS "NUMBER OF COMPANIES"
-> FROM WORTH
-> GROUP BY ORGANIZATION;
+-----+-----+
| ORGANIZATION | NUMBER OF COMPANIES |
+-----+-----+
| AMAZON | 1 |
| APPLE | 1 |
| MICROSOFT | 1 |
| SAMSUNG | 1 |
| TESLA | 1 |
+-----+-----+
5 rows in set, 1 warning (0.001 sec)

MariaDB [devabhav1 db]>
```

STEP-10: Use **HAVING** clause

```
mysql> Select * from WORTH having NET_WORTH < 6 orderby
ORGANIZATION;
```

```
devabhav1@wyvern:~  
MariaDB [devabhav1_db]> SELECT * FROM WORTH;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 1 | APPLE | 9.12 |  
| 2 | MICROSOFT | 8.70 |  
| 4 | AMAZON | 6.00 |  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
5 rows in set (0.000 sec)  
  
MariaDB [devabhav1_db]> SELECT *  
-> FROM WORTH  
-> HAVING NET_WORTH <6  
-> ORDER BY ORGANIZATION;  
+-----+-----+-----+  
| RANK | ORGANIZATION | NET_WORTH |  
+-----+-----+-----+  
| 5 | SAMSUNG | 4.64 |  
| 6 | TESLA | 3.18 |  
+-----+-----+-----+  
2 rows in set (0.001 sec)  
  
MariaDB [devabhav1_db]> 
```