CS313: Lab Assignment 3

B Siddharth Prabhu
200010003@iitdh.ac.in

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1 Question 1: Creation of User and Database

Input Queries:

```
CREATE USER 'lab3'@'localhost' IDENTIFIED BY 'tumajarbisaun';
CREATE DATABASE lab3;
GRANT ALL PRIVILEGES ON lab3.* TO 'lab3'@'localhost';
```

Output Screenshots:

```
mysql> SELECT user FROM user;
+------------------+
| user             |
+------------------+
| debian-sys-maint |
| lab3             |
| mysql.infoschema |
| mysql.session    |
| mysql.sys        |
| root             |
+------------------+
6 rows in set (0.00 sec)
```

(a) New User 'lab3' has been created.

```
mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| Student            |
| information_schema |
| lab3               |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
6 rows in set (0.00 sec)
```

(b) New Database 'lab3' has been created.

Figure 1: New User and New Database Creation from root

```
siddharth@DESKTOP-5490SID:/mnt/c/Users/bsidd/Desktop/CS313 DBIS_Lab/Submissions/Assignment-3$ mysql -u lab3 -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 18
Server version: 8.0.30-0ubuntu0.20.04.2 (Ubuntu)

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owners.

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

mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| lab3               |
| performance_schema |
+--------------------+
3 rows in set (0.00 sec)
```

Figure 2: Clearly, 'lab3' database can be accessed by User 'lab3'.

2 Question 2: Creation of Tables

Input Queries:

```
USE lab3;
CREATE TABLE part(
    `part-no` INT(6) PRIMARY KEY,
    `part-name` VARCHAR(45) NOT NULL,
    color VARCHAR(7),
    weight NUMERIC(7,3)
    );
CREATE TABLE supplier(
    `supplier-no` INT(5) PRIMARY KEY,
    `sup-name` VARCHAR(45) NOT NULL,
    city VARCHAR(30) NOT NULL,
    bank VARCHAR(30)
    );
CREATE TABLE shipment(
    `shipment-no` INT(7) PRIMARY KEY,
    `part-no` INT(6) NOT NULL,
    `supplier-no` INT(5) NOT NULL,
    date DATE,
    quantity INT(5),
    price NUMERIC(7,2),
    FOREIGN KEY (`part-no`) REFERENCES part(`part-no`),
    FOREIGN KEY (`supplier-no`) REFERENCES supplier(`supplier-no`)
    );
```

Output Screenshots:

```
mysql> USE lab3;
Reading table information for completion of table and column name
s
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> SHOW TABLES;
+----------------+
| Tables_in_lab3 |
+----------------+
| part           |
| shipment       |
| supplier       |
+----------------+
3 rows in set (0.00 sec)

mysql> DESCRIBE part;
+-----------+--------------+------+-----+---------+-------+
| Field     | Type         | Null | Key | Default | Extra |
+-----------+--------------+------+-----+---------+-------+
| part-no   | int          | NO   | PRI | NULL    |       |
| part-name | varchar(45)  | NO   |     | NULL    |       |
| color     | varchar(7)   | YES  |     | NULL    |       |
| weight    | decimal(7,3) | YES  |     | NULL    |       |
+-----------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Figure 3: List of Tables and Description of Table 'part'

```
mysql> DESCRIBE supplier;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| supplier-no | int         | NO   | PRI | NULL    |       |
| sup-name    | varchar(45) | NO   |     | NULL    |       |
| city        | varchar(30) | NO   |     | NULL    |       |
| bank        | varchar(30) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.01 sec)

mysql> DESCRIBE shipment;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| shipment-no | int          | NO   | PRI | NULL    |       |
| part-no     | int          | NO   | MUL | NULL    |       |
| supplier-no | int          | NO   | MUL | NULL    |       |
| date        | date         | YES  |     | NULL    |       |
| quantity    | int          | YES  |     | NULL    |       |
| price       | decimal(7,2) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

Figure 4: Description of Tables 'supplier' and 'shipment'

3 Question 3: Insertion of a few Tuples

Input Queries:

```
INSERT INTO part VALUES (10034, "Imager Chip", "#ed795b", 3.4);
INSERT INTO supplier VALUES (2143, "Aurora Tech.", "Bengaluru", "SBI");
INSERT INTO shipment VALUES (1000232, 10034, 2143, "2022-09-01", 3400, 35.4);
```

Output Screenshots:

```
mysql> INSERT INTO part VALUES (10034, "Imager Chip", "#ed795b", 3.4);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO supplier VALUES (2143, "Aurora Tech.", "Bengaluru", "SBI");
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO shipment VALUES (1000232, 10034, 2143, "2022-09-01", 3400, 35.4);
Query OK, 1 row affected (0.01 sec)
```

Figure 5: Insertion of Tuples, Queries OK

```
mysql> SELECT `part-no`, `supplier-no`, `shipment-no` FROM part NATURAL JOIN supplier NATURAL JOIN shipment;
+---------+-------------+-------------+
| part-no | supplier-no | shipment-no |
+---------+-------------+-------------+
|   10034 |        2143 |     1000232 |
+---------+-------------+-------------+
1 row in set (0.00 sec)
```

Figure 6: Checking the insertions

4 Question 4: Insertion of Many Records

Input Queries:

```
INSERT INTO part VALUES (30034, "Unknown Chip", "red", 3.56);
INSERT INTO part VALUES (30134, "Breadboard", "white", 50.4);
INSERT INTO part VALUES (12154, "Processed Graphite", "black", 2.1);
INSERT INTO part VALUES (10023, "Cushion Piece", "red", 100.3);
INSERT INTO part VALUES (23044, "Bobbin", "black", 2.3);

INSERT INTO supplier VALUES (4122, "Horizon Systems", "Pune", "MSC Bank");
INSERT INTO supplier VALUES (9162, "Ikea", "Stockholm", "Swedbank");
INSERT INTO supplier VALUES (4518, "MPQMDSPH Ltd.", "Philadelphia", "Bank of America");
INSERT INTO supplier VALUES (4590, "Weno Mech", "Philadelphia", "Bank of America");
INSERT INTO supplier VALUES (7800, "Ainsama Motors", "Bengaluru", "State Bank of Karnataka");

INSERT INTO shipment VALUES(1100232, 10034, 4518, "2022-09-05", 1000, 32.8);
INSERT INTO shipment VALUES(1100233, 10034, 9162, "2022-09-15", 3000, 35.4);
INSERT INTO shipment VALUES(1100234, 10034, 4590, "2022-08-25", 5000, 50.5);
INSERT INTO shipment VALUES(2200232, 10034, 4590, "2022-07-05", 6700, 20.3);

INSERT INTO shipment VALUES(2200233, 30034, 7800, "2022-05-04", 5600, 20.4);
INSERT INTO shipment VALUES(2200234, 30034, 4590, "2022-07-12", 5000, 10.9);
INSERT INTO shipment VALUES(3300232, 30034, 9162, "2022-08-23", 100, 12.4);
INSERT INTO shipment VALUES(3300233, 30034, 4122, "2022-05-06", 4560, 7.8);

INSERT INTO shipment VALUES(3300234, 12154, 4518, "2022-02-21", 1003, 300.4);
INSERT INTO shipment VALUES(4400232, 12154, 2143, "2022-02-23", 1040, 212.4);
INSERT INTO shipment VALUES(4400233, 12154, 7800, "2022-02-07", 2000, 222.4);
INSERT INTO shipment VALUES(4400234, 12154, 9162, "2022-01-03", 1033, 195.4);

INSERT INTO shipment VALUES(5500232, 10023, 4518, "2022-09-02", 220, 5000);
INSERT INTO shipment VALUES(5500234, 10023, 4122, "2022-08-19", 300, 5990);
INSERT INTO shipment VALUES(5500235, 10023, 7800, "2022-08-14", 700, 7400);
INSERT INTO shipment VALUES(5500237, 10023, 9162, "2022-08-23", 750, 7410);

INSERT INTO shipment VALUES(6600232, 23044, 4518, "2022-08-30", 5200, 1.8);
INSERT INTO shipment VALUES(6600233, 23044, 2143, "2021-12-12", 9600, 2.4);
INSERT INTO shipment VALUES(6600230, 30134, 9162, "2020-02-20", 5000, 5.6);
INSERT INTO shipment VALUES(6600236, 23044, 9162, "2020-02-29", 5050, 3.4);
```

Output Screenshots:

```
mysql> source 200010003_2.sql
Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.02 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.02 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.01 sec)

Query OK, 1 row affected (0.00 sec)
```

(a) Insertions, Queries OK

```
mysql> SELECT * FROM part;
+---------+--------------------+---------+---------+
| part-no | part-name          | color   | weight  |
+---------+--------------------+---------+---------+
|   10023 | Cushion Piece      | red     | 100.300 |
|   10034 | Imager Chip        | #ed795b |   3.400 |
|   12154 | Processed Graphite | black   |   2.100 |
|   23044 | Bobbin             | black   |   2.300 |
|   30034 | Unknown Chip       | red     |   3.560 |
|   30134 | Breadboard         | white   |  50.400 |
+---------+--------------------+---------+---------+
6 rows in set (0.00 sec)

mysql> SELECT * FROM supplier;
+-------------+----------------+-------------+-------------------------+
| supplier-no | sup-name       | city        | bank                    |
+-------------+----------------+-------------+-------------------------+
|        2143 | Aurora Tech.   | Bengaluru   | SBI                     |
|        4122 | Horizon Systems | Pune        | MSC Bank                |
|        4518 | MPQMDSPH Ltd.  | Philadelphia | Bank of America         |
|        4590 | Weno Mech      | Philadelphia | Bank of America         |
|        7800 | Ainsama Motors | Bengaluru   | State Bank of Karnataka |
|        9162 | Ikea           | Stockholm   | Swedbank                |
+-------------+----------------+-------------+-------------------------+
6 rows in set (0.00 sec)
```

(b) All contents of tables ‘part’ and ‘supplier’

```
mysql> SELECT * FROM shipment;
+-------------+---------+-------------+------------+----------+---------+
| shipment-no | part-no | supplier-no | date       | quantity | price   |
+-------------+---------+-------------+------------+----------+---------+
|     1100232 |   10034 |        4518 | 2022-09-05 |     1000 |   32.80 |
|     1100233 |   10034 |        9162 | 2022-09-15 |     3000 |   35.40 |
|     1100234 |   10034 |        4590 | 2022-08-25 |     5000 |   50.50 |
|     2200232 |   10034 |        4590 | 2022-07-05 |     6700 |   20.30 |
|     2200233 |   30034 |        7800 | 2022-05-04 |     5600 |   20.40 |
|     2200234 |   30034 |        4590 | 2022-07-12 |     5000 |   10.90 |
|     3300232 |   30034 |        9162 | 2022-08-23 |      100 |   12.40 |
|     3300233 |   30034 |        4122 | 2022-05-06 |     4560 |    7.80 |
|     3300234 |   12154 |        4518 | 2022-02-21 |     1003 |  300.40 |
|     4400232 |   12154 |        2143 | 2022-02-23 |     1040 |  212.40 |
|     4400233 |   12154 |        7800 | 2022-02-07 |     2000 |  222.40 |
|     4400234 |   12154 |        9162 | 2022-01-03 |     1033 |  195.40 |
|     5500232 |   10023 |        4518 | 2022-09-02 |      220 | 5000.00 |
|     5500234 |   10023 |        4122 | 2022-08-19 |      300 | 5990.00 |
|     5500235 |   10023 |        7800 | 2022-08-14 |      700 | 7400.00 |
|     5500237 |   10023 |        9162 | 2022-08-23 |      750 | 7410.00 |
|     6600232 |   23044 |        4518 | 2022-08-30 |     5200 |    1.80 |
|     6600233 |   23044 |        2143 | 2021-12-12 |     9600 |    2.40 |
|     6600234 |   23044 |        4122 | 2020-02-20 |     5000 |    5.60 |
|     6600236 |   23044 |        9162 | 2020-02-29 |     5050 |    3.40 |
+-------------+---------+-------------+------------+----------+---------+
20 rows in set (0.00 sec)
```

(c) All contents of tables ‘shipment’

Figure 7: Insertion using `source 200010003_2.sql`

5 Question 5: SQL Queries for given questions

Input Queries:

```sql
-- (a) List suppliers who have supplied red parts.
SELECT DISTINCT `sup-name`
FROM (part NATURAL JOIN shipment) NATURAL JOIN supplier
WHERE color = "red";

-- (b) Get the total cost of shipments for all suppliers for making payments to them.
SELECT `supplier-no`, `sup-name`, SUM(quantity*price)
FROM shipment NATURAL JOIN supplier
GROUP BY shipment.`supplier-no`;

-- (c) List suppliers who have supplied all parts
SELECT supplier.`supplier-no`, supplier.`sup-name`
FROM (part NATURAL JOIN shipment) NATURAL JOIN supplier
GROUP BY supplier.`supplier-no`
HAVING COUNT(distinct part.`part-no`) = (
    SELECT COUNT(DISTINCT part.`part-no`)
    FROM part
);
```

Output Screeenshots:

```
mysql> SELECT DISTINCT `sup-name` FROM (part NATURAL JOIN shipment) NATURAL JOIN supplier WHERE color = "red";
+------------------+
| sup-name         |
+------------------+
| MPQMDSPH Ltd.    |
| Horizon Systems  |
| Ainsama Motors   |
| Ikea             |
| Weno Mech        |
+------------------+
5 rows in set (0.00 sec)
```

Figure 8: All suppliers who have supplied red parts

```
mysql> SELECT `supplier-no`, `sup-name`, SUM(quantity*price) FROM shipment NATURAL JOIN supplier GROUP BY shipment.`supplier-no`;
+-------------+-----------------+---------------------+
| supplier-no | sup-name        | SUM(quantity*price) |
+-------------+-----------------+---------------------+
|        2143 | Aurora Tech.    |           364296.00 |
|        4122 | Horizon Systems |          1832568.00 |
|        4518 | MPQMDSPH Ltd.   |          1443461.20 |
|        4590 | Weno Mech       |           443010.00 |
|        7800 | Ainsama Motors  |          5739040.00 |
|        9162 | Ikea            |          5911958.20 |
+-------------+-----------------+---------------------+
6 rows in set (0.01 sec)
```

Figure 9: Total cost of shipments for all suppliers

```
mysql> SELECT supplier.`supplier-no`, supplier.`sup-name`
    -> FROM (part NATURAL JOIN shipment) NATURAL JOIN supplier
    -> GROUP BY supplier.`supplier-no`
    -> HAVING COUNT(distinct part.`part-no`) = (
    ->     SELECT COUNT(DISTINCT part.`part-no`)
    ->     FROM part
    -> );
+-------------+----------+
| supplier-no | sup-name |
+-------------+----------+
|        9162 | Ikea     |
+-------------+----------+
1 row in set (0.01 sec)
```

Figure 10: All suppliers who have supplied red parts