CS313 : DataBases and Information Systems Lab

Lab Assignment 3

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1 Creating User and Database called lab3

1.1 Query

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

1.2 Result

```
mysql> CREATE USER 'lab3'@'localhost' IDENTIFIED BY 'password';
Query OK, 0 rows affected (0.02 sec)

mysql> GRANT ALL PRIVILEGES ON lab3.* TO 'lab3'@'localhost';
Query OK, 0 rows affected (0.00 sec)

mysql> CREATE DATABASE lab3;
Query OK, 1 row affected (0.00 sec)

mysql> SELECT user FROM mysql.user;
+------------------+
| user             |
+------------------+
| lab3             |
| mysql.infoschema |
| mysql.session    |
| mysql.sys        |
| root             |
| sqluser          |
+------------------+
6 rows in set (0.01 sec)

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

mysql>
```

2 Creating the tables: part, supplier, shipment

2.1 Query

```
USE lab3;
CREATE TABLE part(
  part_no VARCHAR(5),
  part_name VARCHAR(20),
  color VARCHAR(20),
  weight numeric(5,3),
  PRIMARY KEY (part_no)
);
CREATE TABLE supplier(
  supplier_no VARCHAR(5),
  sup_name VARCHAR(20),
  city VARCHAR(20),
  bank VARCHAR(20),
  PRIMARY KEY (supplier_no)
);
CREATE TABLE shipment(
  shipment_no VARCHAR(5),
  part_no VARCHAR(5),
  supplier_no VARCHAR(5),
  date DATE,
  quantity numeric(3,0),
  price numeric(7,2),
  PRIMARY KEY (shipment_no),
  FOREIGN KEY (part_no) REFERENCES part(part_no)
    ON DELETE SET NULL,
  FOREIGN KEY (supplier_no) REFERENCES supplier(supplier_no)
    ON DELETE SET NULL
);
```

2.2 Result

```
mysql> USE lab3;
Database changed
mysql> CREATE TABLE part(
    ->   part_no VARCHAR(5),
    ->   part_name VARCHAR(20),
    ->   color VARCHAR(20),
    ->   weight numeric(5,3),
    ->   PRIMARY KEY (part_no)
    -> );
Query OK, 0 rows affected (0.10 sec)

mysql> CREATE TABLE supplier(
    ->   supplier_no VARCHAR(5),
    ->   sup_name VARCHAR(20),
    ->   city VARCHAR(20),
    ->   bank VARCHAR(20),
    ->   PRIMARY KEY (supplier_no)
    -> );
Query OK, 0 rows affected (0.01 sec)

mysql> CREATE TABLE shipment(
    ->   shipment_no VARCHAR(5),
    ->   part_no VARCHAR(5),
    ->   supplier_no VARCHAR(5),
    ->   date DATE,
    ->   quantity numeric(3,0),
    ->   price numeric(7,2),
    ->   PRIMARY KEY (shipment_no),
    ->   FOREIGN KEY (part_no) REFERENCES part(part_no)
    ->     ON DELETE SET NULL,
    ->   FOREIGN KEY (supplier_no) REFERENCES supplier(supplier_no)
    ->     ON DELETE SET NULL
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql>
```

3 Adding one tuple in each table using the mysql *insert* statement

3.1 Query

```
INSERT INTO part VALUES ('00001', 'Wheel', 'Black', 1.5);
INSERT INTO supplier VALUES ('10001', 'Robert', 'Tokyo', 'Tokyo Bank');
INSERT INTO shipment
    VALUES ('20001', '00001', '10001', '2020-05-22', 15, 1000);
```

3.2 Result

```
mysql> INSERT INTO part VALUES ('00001', 'Wheel', 'Black', 1.5);
Query OK, 1 row affected (0.03 sec)

mysql> INSERT INTO supplier VALUES ('10001', 'Robert', 'Tokyo', 'Tokyo Bank');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20001', '00001', '10001', '2020-05-22', 15, 1000);
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM part;
+---------+-----------+-------+--------+
| part_no | part_name | color | weight |
+---------+-----------+-------+--------+
| 00001   | Wheel     | Black |  1.500 |
+---------+-----------+-------+--------+
1 row in set (0.00 sec)

mysql> SELECT * FROM supplier;
+-------------+----------+-------+------------+
| supplier_no | sup_name | city  | bank       |
+-------------+----------+-------+------------+
| 10001       | Robert   | Tokyo | Tokyo Bank |
+-------------+----------+-------+------------+
1 row in set (0.00 sec)

mysql> SELECT * FROM shipment;
+-------------+---------+-------------+------------+----------+---------+
| shipment_no | part_no | supplier_no | date       | quantity | price   |
+-------------+---------+-------------+------------+----------+---------+
| 20001       | 00001   | 10001       | 2020-05-22 |       15 | 1000.00 |
+-------------+---------+-------------+------------+----------+---------+
1 row in set (0.00 sec)

mysql>
```

4 Inserting more data in the tables

4.1 Query

```
USE lab3;
-- table before insertions
SELECT * FROM part;
SELECT * FROM supplier;
SELECT * FROM shipment;
-- inserting new data
INSERT INTO part VALUES ('00002', 'Seat', 'Red', 3);
INSERT INTO part VALUES ('00003', 'Battery', 'White', 1);
INSERT INTO supplier
    VALUES ('10002', 'Watson', 'New York', 'New York Bank');
INSERT INTO shipment
    VALUES ('20002', '00001', '10001', '2022-08-28', 15, 1000);
INSERT INTO shipment
    VALUES ('20003', '00001', '10001', '2021-09-07', 15, 1000);
INSERT INTO shipment
    VALUES ('20004', '00001', '10001', '2021-01-06', 15, 1000);
INSERT INTO shipment
    VALUES ('20005', '00002', '10001', '2020-07-13', 22, 3000);
INSERT INTO shipment
    VALUES ('20006', '00002', '10002', '2022-06-04', 22, 3000);
INSERT INTO shipment
    VALUES ('20007', '00002', '10001', '2022-05-02', 22, 3000);
INSERT INTO shipment
    VALUES ('20008', '00002', '10002', '2021-11-28', 22, 3000);
INSERT INTO shipment
    VALUES ('20009', '00003', '10001', '2021-12-07', 18, 2500);
INSERT INTO shipment
    VALUES ('20010', '00003', '10001', '2020-10-28', 18, 2500);
INSERT INTO shipment
    VALUES ('20011', '00003', '10002', '2020-02-02', 18, 2500);
INSERT INTO shipment
    VALUES ('20012', '00003', '10002', '2022-03-26', 18, 2500);
-- table after insertions
SELECT * FROM part;
SELECT * FROM supplier;
SELECT * FROM shipment;
```

4.2 Results

```
mysql> INSERT INTO part VALUES ('00002', 'Seat', 'Red', 3);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO part VALUES ('00003', 'Battery', 'White', 1);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO supplier VALUES ('10002', 'Watson', 'New York', 'New York Bank');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20002', '00001', '10001', '2022-08-28', 15, 1000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20003', '00001', '10001', '2021-09-07', 15, 1000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20004', '00001', '10001', '2021-01-06', 15, 1000);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO shipment VALUES ('20005', '00002', '10001', '2020-07-13', 22, 3000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20006', '00002', '10002', '2022-06-04', 22, 3000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20007', '00002', '10001', '2022-05-02', 22, 3000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20008', '00002', '10002', '2021-11-28', 22, 3000);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20009', '00003', '10001', '2021-12-07', 18, 2500);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20010', '00003', '10001', '2020-10-28', 18, 2500);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20011', '00003', '10002', '2020-02-02', 18, 2500);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO shipment VALUES ('20012', '00003', '10002', '2022-03-26', 18, 2500);
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> -- table after insertions
mysql> SELECT * FROM part;
+---------+-----------+-------+--------+
| part_no | part_name | color | weight |
+---------+-----------+-------+--------+
| 00001   | Wheel     | Black |  1.500 |
| 00002   | Seat      | Red   |  3.000 |
| 00003   | Battery   | White |  1.000 |
+---------+-----------+-------+--------+
```

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

mysql> INSERT INTO shipment VALUES ('20010', '00003', '10001', '2020-10-28', 18, 2500);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO shipment VALUES ('20011', '00003', '10002', '2020-02-02', 18, 2500);
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO shipment VALUES ('20012', '00003', '10002', '2022-03-26', 18, 2500);
Query OK, 1 row affected (0.00 sec)

mysql>
mysql> -- table after insertions
mysql> SELECT * FROM part;
+---------+-----------+-------+--------+
| part_no | part_name | color | weight |
+---------+-----------+-------+--------+
| 00001   | Wheel     | Black |  1.500 |
| 00002   | Seat      | Red   |  3.000 |
| 00003   | Battery   | White |  1.000 |
+---------+-----------+-------+--------+
3 rows in set (0.00 sec)

mysql> SELECT * FROM supplier;
+-------------+----------+----------+---------------+
| supplier_no | sup_name | city     | bank          |
+-------------+----------+----------+---------------+
| 10001       | Robert   | Tokyo    | Tokyo Bank    |
| 10002       | Watson   | New York | New York Bank |
+-------------+----------+----------+---------------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM shipment;
+-------------+---------+-------------+------------+----------+---------+
| shipment_no | part_no | supplier_no | date       | quantity | price   |
+-------------+---------+-------------+------------+----------+---------+
| 20001       | 00001   | 10001       | 2020-05-22 |       15 | 1000.00 |
| 20002       | 00001   | 10001       | 2022-08-28 |       15 | 1000.00 |
| 20003       | 00001   | 10001       | 2021-09-07 |       15 | 1000.00 |
| 20004       | 00001   | 10001       | 2021-01-06 |       15 | 1000.00 |
| 20005       | 00002   | 10001       | 2020-07-13 |       22 | 3000.00 |
| 20006       | 00002   | 10002       | 2022-06-04 |       22 | 3000.00 |
| 20007       | 00002   | 10001       | 2022-05-02 |       22 | 3000.00 |
| 20008       | 00002   | 10002       | 2021-11-28 |       22 | 3000.00 |
| 20009       | 00003   | 10001       | 2021-12-07 |       18 | 2500.00 |
| 20010       | 00003   | 10001       | 2020-10-28 |       18 | 2500.00 |
| 20011       | 00003   | 10002       | 2020-02-02 |       18 | 2500.00 |
| 20012       | 00003   | 10002       | 2022-03-26 |       18 | 2500.00 |
+-------------+---------+-------------+------------+----------+---------+
12 rows in set (0.00 sec)

mysql>
```

5 Additional queries

5.1 Suppliers who have supplied red parts

5.1.1 Query

```
-- part a
SELECT DISTINCT supplier.sup_name
FROM part NATURAL JOIN supplier NATURAL JOIN shipment
WHERE part.color='Red';
```

5.1.2 Result

```
mysql> SELECT DISTINCT supplier.sup_name
    -> FROM part NATURAL JOIN supplier NATURAL JOIN shipment
    -> WHERE part.color='Red';
+----------+
| sup_name |
+----------+
| Robert   |
| Watson   |
+----------+
2 rows in set (0.01 sec)
```

5.2 Total cost of shipments for all suppliers

5.2.1 Query

```
-- part b
SELECT supplier.sup_name,SUM(shipment.price*shipment.quantity) as payment
FROM shipment NATURAL JOIN supplier
GROUP BY sup_name;
```

5.2.2 Result

```
mysql> SELECT supplier.sup_name,SUM(shipment.price*shipment.quantity) as payment
    -> FROM shipment NATURAL JOIN supplier
    -> GROUP BY sup_name;
+----------+-----------+
| sup_name | payment   |
+----------+-----------+
| Robert   | 282000.00 |
| Watson   | 222000.00 |
+----------+-----------+
2 rows in set (0.00 sec)
```

5.3 Suppliers who have supplied all parts

5.3.1 Query

```
-- part c
SELECT supplier.sup_name
FROM part NATURAL JOIN supplier NATURAL JOIN shipment
GROUP BY supplier.sup_name
HAVING count(distinct part.part_name)=(
      SELECT count(distinct part.part_name)
      FROM part
      );
```

5.3.2 Result

```
mysql> SELECT supplier.sup_name
    -> FROM part NATURAL JOIN supplier NATURAL JOIN shipment
    -> GROUP BY supplier.sup_name
    -> HAVING count(distinct part.part_name)=(SELECT count(distinct part.part_name) FROM part);
+----------+
| sup_name |
+----------+
| Robert   |
+----------+
1 row in set (0.00 sec)
```