

DBMS – Assignment A3

Name:

PRN:

Roll no.:

Class:

Setting up the database

```
mysql> CREATE DATABASE Database_A3;  
Query OK, 1 row affected (0.00 sec)
```

```
mysql> USE Database_A3;  
Database changed  
mysql> CREATE TABLE Account(acc_no INT, branch_name VARCHAR(50),  
balance INT, PRIMARY KEY (acc_no));  
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> CREATE TABLE Branch(branch_name VARCHAR(50), branch_city  
VARCHAR(50), assets INT, PRIMARY KEY (branch_name));  
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> CREATE TABLE Customer (cust_name VARCHAR(50), cust_street  
VARCHAR(50), cust_city VARCHAR(50), PRIMARY KEY (cust_name));  
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> CREATE TABLE Depositor (cust_name VARCHAR(50), acc_no INT);  
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> CREATE TABLE Loan (loan_no INT, branch_name VARCHAR(50),  
amount INT, PRIMARY KEY (loan_no));  
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> CREATE TABLE Borrower (cust_name VARCHAR(50), loan_no INT);  
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> ALTER TABLE Account ADD FOREIGN KEY (branch_name)  
REFERENCES Branch(branch_name);  
Query OK, 0 rows affected (0.08 sec)  
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Depositor ADD FOREIGN KEY (cust_name)  
REFERENCES Customer (cust_name);  
Query OK, 0 rows affected (0.06 sec)  
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Depositor ADD FOREIGN KEY (acc_no) REFERENCES
Account (acc_no);
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Loan ADD FOREIGN KEY (branch_name) REFERENCES
Branch (branch_name);
Query OK, 0 rows affected (0.07 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Borrower ADD FOREIGN KEY (cust_name) REFERENCES
Customer (cust_name);
Query OK, 0 rows affected (0.08 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql> ALTER TABLE Borrower ADD FOREIGN KEY (loan_no) REFERENCES
Loan (loan_no);
Query OK, 0 rows affected (0.06 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

Adding data

```
mysql> INSERT INTO Branch (branch_name, branch_city, assets)
VALUES
```

```
-> ("Pune_Station", "Pune", 5000),
-> ("Hadapsar", "Pune", 20000),
-> ("Dhole_Patil", "Mumbai", 7500),
-> ("Nagarwala", "Nandurbar", 3200);
```

```
Query OK, 4 rows affected (0.01 sec)
Records: 4 Duplicates: 0 Warnings: 0
```

```
mysql> INSERT INTO Customer (cust_name, cust_street, cust_city)
VALUES
```

```
-> ("Kalas", "Airport Road", "Pune"),
-> ("Mehul", "Shahdha", "Nandurbar"),
-> ("Tanmay", "Porwal Road", "Pune"),
-> ("Kshitij", "Hadapasar", "Pune"),
-> ("Aditya", "Mira RD", "Mumbai"),
-> ("Himanshu", "Smart City", "Nandurbar");
```

```
Query OK, 6 rows affected (0.00 sec)
```

Records: 6 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Account (acc_no, branch_name, balance) VALUES
-> (2501, "Dhole_Patil", 5000),
-> (2511, "Pune_Station", 1500),
-> (2521, "Hadapsar", 2000),
-> (2512, "Nagarwala", 5000),
-> (2531, "Pune_Station", 1000);
```

Query OK, 5 rows affected (0.01 sec)

Records: 5 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Loan (loan_no, branch_name, amount) VALUES
-> (155, "Dhole_Patil", 500),
-> (156, "Pune_Station", 250),
-> (157, "Hadapsar", 600),
-> (158, "Nagarwala", 1400),
-> (159, "Pune_Station", 25000);
```

Query OK, 5 rows affected (0.00 sec)

Records: 5 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Borrower VALUES
-> ("Kalas", 156),
-> ("Mehul", 158),
-> ("Tanmay", 155),
-> ("Kshitij", 157),
-> ("Aditya", 159),
-> ("Himanshu", 158);
```

Query OK, 6 rows affected (0.00 sec)

Records: 6 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Depositor VALUES
-> ("Kalas", 2511),
-> ("Mehul", 2512),
```

```
-> ("Tanmay", 2501),
-> ("Kshitij", 2521),
-> ("Aditya", 2531),
-> ("Himanshu", 2512);
```

Query OK, 6 rows affected (0.00 sec)

Records: 6 Duplicates: 0 Warnings: 0

Questions

A) Consider following relation and solve the queries: Create different tables given below with appropriate constraints like primary key, foreign key, check constraints, not null etc.

Account (Acc_no, branch_name, balance)

Branch (branch_name, branch_city, assets)

Customer (cust_name, cust_street, cust_city)

Depositor (cust_name, acc_no)

Loan (loan_no, branch_name, amount)

Borrower (cust_name, loan_no)

1. Create a View1 to display List all customers in alphabetical order who have loan from Pune_Station branch.

```
mysql> CREATE VIEW View1 AS
```

```
-> SELECT cust_name
```

```
-> FROM Borrower
```

```
-> INNER JOIN Loan ON Borrower.loan_no = Loan.loan_no
```

```
-> WHERE branch_name = "Pune_Station"
```

```
-> ORDER BY cust_name;
```

Query OK, 0 rows affected (0.02 sec)

```
mysql> SELECT * FROM View1;
```

```
+-----+
```

```
| cust_name |
```

```
+-----+
```

```
| Aditya    |
```

```
| Kalas     |
```

```
+-----+
```

2 rows in set (0.00 sec)

2. Create View2 on branch table by selecting any two columns and perform insert update delete operations.

```
mysql> CREATE VIEW View2 AS  
-> SELECT branch_name, branch_city  
-> FROM Branch;
```

Query OK, 0 rows affected (0.01 sec)

```
mysql> SELECT * FROM View2;
```

branch_name	branch_city
Dhole_Patil	Mumbai
Hadapsar	Pune
Nagarwala	Nandurbar
Pune_Station	Pune

4 rows in set (0.00 sec)

```
mysql> -- Insert operation
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> INSERT INTO View2 (branch_name, branch_city) VALUES  
( 'Yerwada', 'Pune');
```

Query OK, 1 row affected (0.01 sec)

```
mysql> SELECT * FROM View2;
```

branch_name	branch_city
Dhole_Patil	Mumbai
Hadapsar	Pune

```
| Nagarwala      | Nandurbar      |
| Pune_Station  | Pune            |
| Yerwada        | Pune            |
```

```
+-----+-----+
```

5 rows in set (0.00 sec)

```
mysql> -- Update operation
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> UPDATE View2 SET branch_name = 'Peachtree' WHERE
branch_name = 'Yerwada';
```

Query OK, 1 row affected (0.00 sec)

Rows matched: 1 Changed: 1 Warnings: 0

```
mysql> SELECT * FROM View2;
```

```
+-----+-----+
```

```
| branch_name    | branch_city     |
```

```
+-----+-----+
```

```
| Dhole_Patil    | Mumbai          |
```

```
| Hadapsar        | Pune             |
```

```
| Nagarwala      | Nandurbar       |
```

```
| Peachtree      | Pune             |
```

```
| Pune_Station   | Pune             |
```

```
+-----+-----+
```

5 rows in set (0.00 sec)

```
mysql> -- Delete operation
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> DELETE FROM View2 WHERE branch_name = 'Peachtree';
```

Query OK, 1 row affected (0.00 sec)

```
mysql> SELECT * FROM View2;
```

```

+-----+-----+
| branch_name | branch_city |
+-----+-----+
| Dhole_Patil | Mumbai      |
| Hadapsar    | Pune        |
| Nagarwala   | Nandurbar   |
| Pune_Station | Pune        |
+-----+-----+
4 rows in set (0.01 sec)

```

3. Create View3 on borrower and depositor table by selecting any one column from each table perform insert update delete operations.

```

mysql> CREATE VIEW View3 AS
    -> SELECT Borrower.cust_name, Depositor.acc_no
    -> FROM Borrower JOIN Depositor ON Borrower.cust_name =
Depositor.cust_name;
Query OK, 0 rows affected (0.01 sec)

```

```

mysql> SELECT * FROM View3;

```

```

+-----+-----+
| cust_name | acc_no |
+-----+-----+
| Aditya    | 2531   |
| Himanshu  | 2512   |
| Kalas     | 2511   |
| Kshitij   | 2521   |
| Mehul     | 2512   |
| Tanmay    | 2501   |
+-----+-----+
6 rows in set (0.01 sec)

```

```

mysql> -- Insert operation
Query OK, 0 rows affected (0.00 sec)

```

```
mysql> INSERT INTO Customer (cust_name, cust_street, cust_city)
VALUES ("Macho", "Pedgaon", "Ahemadnagar");
```

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

```
mysql> INSERT INTO Account (acc_no, branch_name, balance) VALUES
(2502, "Hadapsar", 3000);
```

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

```
mysql> INSERT INTO Loan (loan_no, branch_name, amount) VALUES
(160, "Hadapsar", 500);
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> INSERT INTO Borrower (cust_name, loan_no) VALUES ("Macho",
160);
```

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

```
mysql> INSERT INTO Depositor(cust_name, Acc_no) VALUES("Macho",
2502);
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> SELECT * FROM View3;
```

```
+-----+-----+
| cust_name | acc_no |
+-----+-----+
| Aditya    | 2531   |
| Himanshu  | 2512   |
| Kalas     | 2511   |
| Kshitij   | 2521   |
| Macho     | 2502   |
| Mehul     | 2512   |
| Tanmay    | 2501   |
+-----+-----+
```

```
7 rows in set (0.00 sec)
```

```
mysql> -- Update operation
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> INSERT INTO Account (acc_no, branch_name, balance) VALUES
(2566, 'Hadapsar', 3000);
Query OK, 1 row affected (0.00 sec)
```

```
mysql> UPDATE Depositor SET acc_no = 2566 WHERE cust_name =
'Macho';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> SELECT * FROM View3;
```

```
+-----+-----+
| cust_name | acc_no |
+-----+-----+
| Aditya    | 2531   |
| Himanshu  | 2512   |
| Kalas     | 2511   |
| Kshitij   | 2521   |
| Macho     | 2566   |
| Mehul     | 2512   |
| Tanmay    | 2501   |
+-----+-----+
```

```
7 rows in set (0.00 sec)
```

```
mysql> -- Delete operation
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> DELETE FROM Borrower WHERE cust_name = 'Macho';
Query OK, 1 row affected (0.01 sec)
```

```
mysql> DELETE FROM Depositor WHERE cust_name = 'Macho';
Query OK, 1 row affected (0.00 sec)
```

```
mysql> SELECT * FROM View3;
```

```
+-----+-----+
| cust_name | acc_no |
+-----+-----+
| Aditya    | 2531   |
| Himanshu  | 2512   |
| Kalas     | 2511   |
| Kshitij   | 2521   |
| Mehul     | 2512   |
| Tanmay    | 2501   |
+-----+-----+
```

```
6 rows in set (0.00 sec)
```

4. Create Union of left and right joint for all customers who have an account or loan or both at bank

```
mysql> SELECT DISTINCT Customer.cust_name
-> FROM Customer
-> LEFT JOIN Depositor ON Customer.cust_name =
Depositor.cust_name
-> LEFT JOIN Borrower ON Customer.cust_name =
Borrower.cust_name
-> WHERE Depositor.acc_no IS NOT NULL OR Borrower.loan_no IS
NOT NULL;
```

```
+-----+
| cust_name |
+-----+
| Aditya    |
| Himanshu  |
| Kalas     |
| Kshitij   |
| Mehul     |
```

```
| Tanmay      |
```

```
+-----+
```

```
6 rows in set (0.00 sec)
```

5. Display content of View1,View2,View3

```
mysql> SELECT * FROM View1;
```

```
+-----+
```

```
| cust_name  |
```

```
+-----+
```

```
| Aditya     |
```

```
| Kalas      |
```

```
+-----+
```

```
2 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM View2;
```

```
+-----+-----+
```

```
| branch_name | branch_city |
```

```
+-----+-----+
```

```
| Dhole_Patil | Mumbai      |
```

```
| Hadapsar    | Pune        |
```

```
| Nagarwala   | Nandurbar   |
```

```
| Pune_Station | Pune        |
```

```
+-----+-----+
```

```
4 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM View3;
```

```
+-----+-----+
```

```
| cust_name  | acc_no  |
```

```
+-----+-----+
```

```
| Aditya     | 2531   |
```

```
| Himanshu   | 2512   |
```

```
| Kalas      | 2511   |
```

```
| Kshitij    | 2521   |
```

```
| Mehul      | 2512   |
```

```
| Tanmay      | 2501 |
+-----+-----+
6 rows in set (0.00 sec)
```

6. Create Simple and Unique index.

```
mysql> -- Simple Index
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> CREATE INDEX cust_ind ON Customer (cust_city);
Query OK, 0 rows affected (0.05 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

```
mysql>
mysql> -- Unique Index
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> CREATE UNIQUE INDEX branch_ind ON Branch (branch_name);
Query OK, 0 rows affected (0.02 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

7. Display index Information

```
mysql> SHOW INDEX FROM Customer;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Table | Non_unique | Key_name | Seq_in_index | Column_name | Collation | Cardinality | Sub_part | Packed | Null | Index_type | Comment | Index_comment | Visible | Expression |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Customer | 0 | PRIMARY | 1 | cust_name | A | 6 | NULL | NULL | NULL | BTREE | | | YES | NULL |
| Customer | 1 | cust_ind | 1 | cust_city | A | 4 | NULL | NULL | YES | BTREE | | | YES | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

2 rows in set (0.00 sec)

```
mysql> SHOW INDEX FROM Branch;
```

```
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Table | Non_unique | Key_name | Seq_in_index | Column_name | Collation | Cardinality | Sub_part | Packed | Null | Index_type | Comment | Index_comment | Visible | Expression |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| Branch | 0 | PRIMARY | 1 | branch_name | A | 4 | NULL | NULL | NULL | BTREE | | | YES | NULL |
| Branch | 0 | branch_ind | 1 | branch_name | A | 4 | NULL | NULL | NULL | BTREE | | | YES | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```

2 rows in set (0.01 sec)

8. Truncate table Customer.

```
mysql> DROP TABLE Depositor;
```

Query OK, 0 rows affected (0.02 sec)

```
mysql> DROP TABLE Borrower;
```

Query OK, 0 rows affected (0.02 sec)

```
mysql> TRUNCATE TABLE Customer;
```

Query OK, 0 rows affected (0.04 sec)

B) Consider following Relation:

Companies (comp_id, name, cost, year)

C001 ONGC 2000 2010

C002 HPCL 2500 2012

C005 IOCL 1000 2014

C006 BHEL 3000 2015

Orders (comp_id, domain, quantity)

C001 Oil 09

C002 Gas 121

C005 Telecom 115

Create above tables with appropriate constraints execute the following query:

Setting up the database

```
mysql> CREATE TABLE Companies(comp_id varchar(50), name  
varchar(50), cost int, year int);
```

Query OK, 0 rows affected (0.03 sec)

```
mysql> CREATE TABLE Orders(comp_id varchar(50), domain  
varchar(50), quantity int);
```

Query OK, 0 rows affected (0.03 sec)

Adding values

```
mysql> INSERT INTO Companies (comp_id, name, cost, year) VALUES  
-> ("C001", "ONGC", 2000, 2010),
```

```
-> ("C002", "HPCL", 2500, 2012),
-> ("C005", "IOCL", 1000, 2014),
-> ("C006", "BHEL", 3000, 2015);
```

Query OK, 4 rows affected (0.01 sec)

Records: 4 Duplicates: 0 Warnings: 0

```
mysql> INSERT INTO Orders (comp_id, domain, quantity) VALUES
```

```
-> ("C001", "Oil", 109),
-> ("C002", "Gas", 121),
-> ("C005", "Telecom", 115);
```

Query OK, 3 rows affected (0.01 sec)

Records: 3 Duplicates: 0 Warnings: 0

1. Find names, costs, domains and quantities for companies using inner join.

```
mysql> SELECT name, cost, domain, quantity FROM Companies INNER
JOIN Orders on Companies.comp_id = Orders.comp_id;
```

```
+-----+-----+-----+-----+
| name | cost | domain | quantity |
+-----+-----+-----+-----+
| ONGC | 2000 | Oil     | 109     |
| HPCL | 2500 | Gas     | 121     |
| IOCL | 1000 | Telecom | 115     |
+-----+-----+-----+-----+
```

3 rows in set (0.00 sec)

2. Find names, costs, domains and quantities for companies using left outer join.

```
mysql> SELECT name, cost, domain, quantity FROM Companies LEFT
OUTER JOIN Orders ON Companies.comp_id = Orders.comp_id;
```

```
+-----+-----+-----+-----+
| name | cost | domain | quantity |
+-----+-----+-----+-----+
| ONGC | 2000 | Oil     | 109     |
| HPCL | 2500 | Gas     | 121     |
```

```

| IOCL | 1000 | Telecom |      115 |
| BHEL | 3000 | NULL    |      NULL |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)

```

3. Find names, costs, domains and quantities for companies using right outer join.

```
mysql> SELECT name, cost, domain, quantity FROM Companies RIGHT
OUTER JOIN Orders ON Companies.comp_id = Orders.comp_id;
```

```

+-----+-----+-----+-----+
| name | cost | domain | quantity |
+-----+-----+-----+-----+
| ONGC | 2000 | Oil    |      109 |
| HPCL | 2500 | Gas    |      121 |
| IOCL | 1000 | Telecom|      115 |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

```

4. Find names, costs, domains and quantities for companies using Union operator.

```
mysql> SELECT name, cost FROM Companies UNION SELECT domain,
quantity FROM Orders;
```

```

+-----+-----+
| name   | cost |
+-----+-----+
| ONGC   | 2000 |
| HPCL   | 2500 |
| IOCL   | 1000 |
| BHEL   | 3000 |
| Oil    | 109  |
| Gas    | 121  |
| Telecom| 115  |
+-----+-----+
7 rows in set (0.00 sec)

```

5. Create View View1 by selecting both tables to show company name and quantities.

```
mysql> CREATE VIEW view1 AS SELECT name, quantity FROM Companies  
JOIN Orders ON Companies.comp_id = Orders.comp_id;
```

Query OK, 0 rows affected (0.01 sec)

```
mysql> SELECT * FROM view1;
```

```
+-----+-----+  
| name | quantity |  
+-----+-----+  
| ONGC |      109 |  
| HPCL |      121 |  
| IOCL |      115 |  
+-----+-----+
```

3 rows in set (0.00 sec)

6. Create View2 on branch table by selecting any two columns and perform insert update delete operations.

```
mysql> CREATE VIEW view2 AS SELECT name, cost FROM Companies;
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> SELECT * FROM view2;
```

```
+-----+-----+  
| name | cost |  
+-----+-----+  
| ONGC | 2000 |  
| HPCL | 2500 |  
| IOCL | 1000 |  
| BHEL | 3000 |  
+-----+-----+
```

4 rows in set (0.00 sec)

```
mysql> -- Insert operation
```

Query OK, 0 rows affected (0.00 sec)

```
mysql> INSERT INTO view2 (name, cost) VALUES ("BCCC", 3100);
Query OK, 1 row affected (0.01 sec)
```

```
mysql> SELECT * FROM view2;
```

```
+-----+-----+
| name | cost |
+-----+-----+
| ONGC | 2000 |
| HPCL | 2500 |
| IOCL | 1000 |
| BHEL | 3000 |
| BCCC | 3100 |
+-----+-----+
```

```
5 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql> -- Update operation
```

```
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> UPDATE view2 SET cost = 3500 WHERE name = "BCCC";
```

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

```
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> SELECT * FROM view2;
```

```
+-----+-----+
| name | cost |
+-----+-----+
| ONGC | 2000 |
| HPCL | 2500 |
| IOCL | 1000 |
| BHEL | 3000 |
| BCCC | 3500 |
+-----+-----+
```

```
+-----+-----+
```

```
5 rows in set (0.00 sec)
```

```
mysql>
```

```
mysql> -- Delete operation
```

```
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> DELETE FROM view2 WHERE name = "BCCC";
```

```
Query OK, 1 row affected (0.01 sec)
```

```
mysql> SELECT * FROM view2;
```

```
+-----+-----+
```

```
| name | cost |
```

```
+-----+-----+
```

```
| ONGC | 2000 |
```

```
| HPCL | 2500 |
```

```
| IOCL | 1000 |
```

```
| BHEL | 3000 |
```

```
+-----+-----+
```

```
4 rows in set (0.00 sec)
```

7. Display content of View1, View2.

```
mysql> SELECT * from view1;
```

```
+-----+-----+
```

```
| name | quantity |
```

```
+-----+-----+
```

```
| ONGC |      109 |
```

```
| HPCL |      121 |
```

```
| IOCL |      115 |
```

```
+-----+-----+
```

```
3 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM view2;
```

```
+-----+-----+
| name | cost |
+-----+-----+
| ONGC | 2000 |
| HPCL | 2500 |
| IOCL | 1000 |
| BHEL | 3000 |
+-----+-----+
```

4 rows in set (0.00 sec)

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