



Assignment 02:

Title: SQL Queries

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Problem statement:

- a) Design & develop SQL DDL statements which demonstrate the use of SQL objects such as Table, View, Index, Sequence, Synonym etc.
- b) Write at least 10 SQL queries on the suitable database application using SQL DML statements.

Objectives:

- 1) Understand & implement the various DDL commands
- 2) Understand database concepts like view, index, sequence & synonym

Outcomes

- 1) Use DML to perform various queries on database of book publishing company
- 2) Use database concepts like view on large datasets.

Theory Related Concepts:

Data Definition in SQL: (Syntax)

Creating Tables:

Create table <table_name>

(column_name1 datatype size),
column_name2 datatype size),



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Primary key constraints:

- 1> A table can have only one primary key
- 2> Cannot left blank
- 3> Data must be unique
- 4> No allows null values
- 5> Unique index is created automatically if there is a primary key

Fetching Data from Table.

- SQL SELECT command is useful to fetch data from database

- syntax

```
SELECT field-1, field-2  
FROM table-1, table-2  
WHERE <condition>
```

LIKE in MySQL

- This is useful in finding matching characters from string

- syntax

```
SELECT <fields>
```

```
FROM <tables>
```

```
WHERE Field LIKE condition = 'some value'
```

- It can be used with regular expressions

COUNT in SQL

- This is useful in counting number of records

- syntax:

```
SELECT COUNT(column-name) FROM tablename
```

```
WHERE condition
```



DISTINCT in SQL

- It is useful to select distinct records.
- syntax

```
SELECT distinct column1, column2  
FROM table-name.
```

ORDER BY in SQL

- It is useful to sort the records in ascending / descending order.
- syntax:

```
SELECT column1, column2  
FROM table-name
```

```
ORDER BY column1, column2 DESC|ASC.
```

MIN() MAX() in SQL

- MIN() returns smallest value of selected column whereas MAX() returns maximum value in selected column.
- Syntax

```
SELECT MIN(column_name)  
FROM table-name;
```

SQL UNION operator

- UNION operator is used to combine the result-set of two/more SELECT statements

- syntax:

```
SELECT column-name(s) FROM table1
```

```
UNION
```

```
SELECT column-name(s) FROM table2;
```

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SQL INTERSECT operator:

- It is used to combine two select statements where result of selection is common rows from both select statements.

- Syntax:

```

SELECT (column-1)
FROM table-1
WHERE condition
INTERSECT
SELECT (column-1)
FROM table-2
WHERE condition.
  
```

IN() function in SQL

- IN() function finds match in given arguments
- the function returns boolean value depends on match is present / not
- Syntax:

```

SELECT (column.name(s))
FROM 'table name'
WHERE column-name IN (value-1, value-2, ..., val-n)
  
```

SQL Views:

- In SQL view is a virtual table based on the result set of an SQL statement
- View contains rows, columns just like real tables
- Syntax:



CREATE VIEW view-name AS
SELECT column1, column2,
FROM table-name
WHERE condition;

Test cases:

Queries:

- 1) Insert at least 10 records in Customer table & Insert in other tables accordingly
- 2) Display all customer details with city name Pune & Mumbai & customer's first name starting with 'p' @ 'h'
- 3) List the number of different customer cities.
- 4) Give 5% increase in price of the books with publishing year 2015.
- 5) Delete customer details living in Pune.
- 6) Find names of authors living in India @ Australia.
- 7) Find the publishers who are established in years 2015 as well as in 2016.
- 8) Find the book having maximum price & find titles of book having price b/w 300 & 400.
- 9) Display all titles of books with price & published year in decreasing order of publishing year.
- 10) Display title, author_no, & publisher_no. of all books published in 2004, 2006, 2000.
- 11) Create View showing the books & author details.

Tables in database:

- Customer(cust_no, cust_fname, cust_lname, cust_company, cust_addr, city, cust_phone)



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- Ordering (order-no, ISBN, qty, date)
- Books (ISBN, title, unit-price, author-no, publisher-no, publ, year)
- Authors (author-no, author-name, company):
- Publisher (publisher-no, publisher-name, publisher-addr, year)

Program listing & Output

Creation Queries:

```
CREATE TABLE Customer
(
    cust_no INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
    cust_fname VARCHAR(100),
    cust_lname VARCHAR(100),
    cust_company VARCHAR(100),
    cust_addr VARCHAR(200),
    city VARCHAR(100),
    cust_phone VARCHAR(15)
);

CREATE TABLE Author
(
    author_no INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    author_name VARCHAR(100),
    country VARCHAR(50)
);

CREATE TABLE Publisher
(
    publisher_no INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    publisher_name VARCHAR(100),
    publisher_addr VARCHAR(500),
    est_year INT
);

CREATE TABLE Books
(
    ISBN VARCHAR(50) NOT NULL PRIMARY KEY,
    title VARCHAR(200) NOT NULL,
    unit_price INT NOT NULL,
    author_no INT NOT NULL,
    publisher_no INT NOT NULL,
    publ_year INT,
    FOREIGN KEY (author_no) REFERENCES Author (author_no) ON DELETE CASCADE,
    FOREIGN KEY (publisher_no) REFERENCES Publisher (publisher_no) ON DELETE CASCADE
);

CREATE TABLE Ordering
(
    order_no INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
```

```

    cust_no INT NOT NULL,
    ISBN VARCHAR(50) NOT NULL,
    quantity INT,
    ord_date DATE,
    FOREIGN KEY (cust_no) REFERENCES Customer (cust_no) ON DELETE CASCADE,
    FOREIGN KEY (ISBN) REFERENCES Books (ISBN) ON DELETE CASCADE
);

```

Insert Queries:

```

INSERT INTO Customer(cust_fname, cust_lname, cust_company, cust_addr, ci
ty, cust_phone)
VALUES
('Harry', 'Potter', 'HSWW', 'Great Britain', 'Scotland', '62442-62442'),
('John', 'Wick', 'Lionsgate', 'Tilak Road', 'Pune', '8888888888'),
('Prince', 'Kaiser', 'Handsopher', 'MG Road', 'Pune', '9758398398'),
('Steve', 'Rogers', 'Captain America', 'US Road', 'Mumbai', '9876543210'),
),
('Tony', 'Stark', 'Iron Man', 'New York City Road', 'Delhi', '9999999999
'),
('King', 'TChalla', 'Black Panther', 'Wakanda Road', 'Mumbai', '98766789
12'),
('Natasha', 'Romanoff', 'Black Wodow', 'Avenger Tower', 'Kolkata', '8989
898989'),
('Bruce', 'Banner', 'Hulk', 'Dyton', 'Mumbai', '8917372989'),
('Thor', 'Odinson', 'Thunder', 'Asgard', 'Pune', '9877800970'),
('Scot', 'Lang', 'Ant-
Man', 'Quantum World, Worm Hole', 'MP', '9878988900')
;

INSERT INTO Author(author_name, country)
VALUES
('Hector Garcia', 'Japan'),
('James Clear', 'Australia'),
('Morgan Housel', 'Russia'),
('Robert Kiyosaki', 'Australia'),
('George RR Martin', 'USA'),
('Chetan Bhagan', 'India'),
('JK Rowling', 'USA'),
('JRR Tolkien', 'England'),
('Paulo Coelho', 'Portuguese');

INSERT INTO Publisher(publisher_name, publisher_addr, est_year)
VALUES

```

```

('ABC Publication', 'Pune', 2015),
('XYZ Publication', 'Mumbai', 2016),
('Red Heart Publication', 'Kolkata', 2014),
('Common Man Publication', 'Delhi', 2011),
('VV Publication', 'Meghalaya', 2019),
('ABC Publication', 'Pune', 2016);

INSERT INTO Books(ISBN, title, unit_price, author_no, publisher_no, publ_year)
VALUES
('123-456-789-123-4', 'Ikigai', 320, 1, 1, 2000),
('234-567-890-123-4', 'Atomic Habits', 380, 2, 2, 2004),
('345-678-901-234-5', 'The Psychology of Money', 400, 3, 3, 2006),
('456-789-012-345-6', 'Rich Dad and Poor Dad', 280, 4, 4, 2000),
('567-890-123-456-7', 'The Game of Thrones', 1100, 5, 4, 2006),
('678-901-234-567-8', 'Lord Of The Rings', '1500', 8, 1, 1999),
('789-012-345-678-9', 'The Alchemist', '400', 9, 2, 1995),
('123-456-789-123-5', 'Radom', 320, 7, 5, 2015);

INSERT INTO Ordering(cust_no, ISBN, quantity, ord_date)
VALUES
(4, '567-890-123-456-7', 5, '2021-08-20'),
(9, '678-901-234-567-8', 3, '2021-08-22');

```

Select Queries:

```

SELECT *
FROM Customer
WHERE cust_fname LIKE 'p%' OR cust_fname LIKE 'h%';

SELECT DISTINCT city
FROM Customer;

SELECT author_name, country
FROM Author
WHERE country='India'
UNION
SELECT author_name, country
FROM Author
WHERE country='Australia'

SELECT publisher_name, est_year
FROM Publisher
WHERE est_year=2015

```

```

AND publisher_name IN (SELECT publisher_name
FROM Publisher
WHERE est_year=2016);

SELECT *
FROM Books
WHERE unit_price=(SELECT MAX(unit_price) FROM Books);

SELECT title, unit_price
FROM Books
WHERE unit_price BETWEEN 300 AND 400;

SELECT title, unit_price, publ_year
FROM Books
ORDER BY publ_year DESC;

SELECT title, author_no, publisher_no
FROM Books
WHERE publ_year IN(2000, 2004, 2006);

CREATE VIEW books_and_authors AS
SELECT title, author_name
FROM Books, Author
WHERE Books.author_no=Author.author_no;

SELECT * FROM books_and_authors;

```

Update Queries:

```

SELECT *
FROM Books
WHERE publ_year=2015;

UPDATE Books
SET unit_price = 1.05*unit_price
WHERE publ_year=2015;

SELECT *
FROM Books
WHERE publ_year=2015;

```

Delete Queries:

```

SELECT *
FROM Customer

```

```
WHERE city='Pune';

DELETE FROM Customer
WHERE city='Pune';

SELECT *
FROM Customer
WHERE city='Pune';
```

Outputs:

Tales in database:

```
mysql> SHOW TABLES;
+-----+
| Tables_in_a02_database |
+-----+
| author
| books
| customer
| ordering
| publisher
+-----+
5 rows in set (0.00 sec)
```

Table schema:

```
mysql> DESC author;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| author_no | int | NO | PRI | NULL | auto_increment |
| author_name | varchar(100) | YES | | NULL |
| country | varchar(50) | YES | | NULL |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

```
mysql> DESC books;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ISBN | varchar(50) | NO | PRI | NULL |
| title | varchar(200) | NO | | NULL |
| unit_price | int | NO | | NULL |
| author_no | int | NO | MUL | NULL |
| publisher_no | int | NO | MUL | NULL |
| publ_year | int | YES | | NULL |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

```
mysql> DESC customer;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| cust_no | int | NO | PRI | NULL | auto_increment |
| cust_fname | varchar(100) | YES | | NULL |
| cust_lname | varchar(100) | YES | | NULL |
| cust_company | varchar(100) | YES | | NULL |
| cust_addr | varchar(200) | YES | | NULL |
| city | varchar(100) | YES | | NULL |
| cust_phone | varchar(15) | YES | | NULL |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

```
mysql> DESC ordering;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| order_no | int | NO | PRI | NULL | auto_increment |
| cust_no | int | NO | MUL | NULL |
| ISBN | varchar(50) | NO | MUL | NULL |
| quantity | int | YES | | NULL |
| ord_date | date | YES | | NULL |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

```
mysql> DESC publisher;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| publisher_no | int | NO | PRI | NULL | auto_increment |
| publisher_name | varchar(100) | YES | | NULL |
| publisher_addr | varchar(500) | YES | | NULL |
| est_year | int | YES | | NULL |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Table Data:

```
mysql> SELECT * FROM author;
```

author_no	author_name	country
1	Hector Garcia	Japan
2	James Clear	
3	Morgan Housel	
4	Robert Kiyosaki	
5	George RR Martin	USA
6	Chetan Bhagan	India
7	JK Rowling	USA
8	JRR Tolkien	England
9	Paulo Coelho	Portuguese

9 rows in set (0.00 sec)

```
mysql> SELECT * FROM books;
```

ISBN	title	unit_price	author_no	publisher_no	publ_year
123-456-789-123-4	Ikigai	320	1	1	2000
234-567-890-123-4	Atomic Habits	380	2	2	2004
345-678-901-234-5	The Psychology of Money	400	3	3	2006
456-789-012-345-6	Rich Dad and Poor Dad	280	4	4	2000
567-890-123-456-7	The Game of Thrones	1100	5	4	2006
678-901-234-567-8	Lord Of The Rings	1500	8	1	1999
789-012-345-678-9	The Alchemist	400	9	2	1995

7 rows in set (0.00 sec)

```
mysql> SELECT * FROM customer;
```

cust_no	cust_fname	cust_lname	cust_company	cust_addr	city	cust_phone
1	Harry	Potter	HSNN	Great Britain	Scotland	62442-62442
2	John	Wick	Lionsgate	Tilak Road	Pune	8888888888
3	Prince	Kaiser	Handsopher	MG Road	Pune	9758398398
4	Steve	Rogers	Captain America	US Road	Mumbai	9876543210
5	Tony	Stark	Iron Man	New York City Road	Delhi	9999999999
6	King	TChalla	Black Panther	Wakanda Road	Mumbai	9876678912
7	Natasha	Romanoff	Black Wodow	Avenger Tower	Kolkata	8989898989
8	Bruce	Banner	Hulk	Dyton	Mumbai	8917372989
9	Thor	Odinson	Thunder	Asgard	Pune	9877800970
10	Scot	Lang	Ant-Man	Quantum World, Worm Hole	MP	9878988900

10 rows in set (0.00 sec)

```
mysql> select * from ordering;
+-----+-----+-----+-----+
| order_no | cust_no | ISBN           | quantity | ord_date   |
+-----+-----+-----+-----+
|      3 |      4 | 567-890-123-456-7 |        5 | 2021-08-20 |
|      4 |      9 | 678-901-234-567-8 |        3 | 2021-08-22 |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM publisher;
+-----+-----+-----+-----+
| publisher_no | publisher_name | publisher_addr | est_year |
+-----+-----+-----+-----+
|      1 | ABC Publication | Pune          | 2015    |
|      2 | XYZ Publication | Mumbai         | 2016    |
|      3 | Red Heart Publication | Kolkata | 2014    |
|      4 | Common Man Publication | Delhi | 2011    |
|      5 | VV Publication | Meghalaya | 2019    |
+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

All DML Queries:

- Display all customer details with city Pune and Mumbai and customer first name starting with 'p' or 'h'

```
mysql> SOURCE select.sql;
+-----+-----+-----+-----+-----+-----+-----+
| cust_no | cust_fname | cust_lname | cust_company | cust_addr | city | cust_phone |
+-----+-----+-----+-----+-----+-----+-----+
|      1 | Harry     | Potter     | HSNW       | Great Britain | Scotland | 62442-62442 |
|      3 | Prince    | Kaiser    | Handsopher | MG Road     | Pune    | 9758398398 |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

- lists the number of different customer cities.

```
mysql> SOURCE select.sql;
+-----+
| city |
+-----+
| Scotland |
| Pune |
| Mumbai |
| Delhi |
| Kolkata |
| MP |
+-----+
6 rows in set (0.00 sec)
```

3. Give 5% increase in price of the books with publishing year 2015

```
mysql> SOURCE update.sql;
+-----+-----+-----+-----+-----+
| ISBN      | title | unit_price | author_no | publisher_no | publ_year |
+-----+-----+-----+-----+-----+
| 123-456-789-123-5 | Radom |       320 |         7 |           5 |     2015 |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> SOURCE update.sql;
+-----+-----+-----+-----+-----+
| ISBN      | title | unit_price | author_no | publisher_no | publ_year |
+-----+-----+-----+-----+-----+
| 123-456-789-123-5 | Radom |       320 |         7 |           5 |     2015 |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

+-----+-----+-----+-----+-----+
| ISBN      | title | unit_price | author_no | publisher_no | publ_year |
+-----+-----+-----+-----+-----+
| 123-456-789-123-5 | Radom |       336 |         7 |           5 |     2015 |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

4. Delete customer details living in pune

```
mysql> SOURCE delete.sql;
+-----+-----+-----+-----+-----+
| cust_no | cust_fname | cust_lname | cust_company | cust_addr | city | cust_phone |
+-----+-----+-----+-----+-----+
|     2 | John      | Wick      | Lionsgate    | Tilak Road | Pune | 88888888888 |
|     3 | Prince    | Kaiser    | Handsopher  | MG Road   | Pune | 9758398398 |
|     9 | Thor      | Odinson   | Thunder     | Asgard    | Pune | 9877800970 |
+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

Query OK, 3 rows affected (0.00 sec)

Empty set (0.00 sec)
```

5. Find the names of authors living in India or Australia

```
mysql> SELECT * FROM author;
+-----+-----+
| author_no | author_name      | country |
+-----+-----+
| 1         | Hector Garcia    | Japan   |
| 2         | James Clear       |          |
| 3         | Morgan Housel    | Australia|
| 4         | Robert Kiyosaki   |          |
| 5         | George RR Martin  | USA     |
| 6         | Chetan Bhagan    | India   |
| 7         | JK Rowling        | USA     |
| 8         | JRR Tolkien       | England |
| 9         | Paulo Coelho     | Portuguese|
+-----+-----+
9 rows in set (0.00 sec)

mysql> SOURCE select.sql;
+-----+-----+
| author_name | country |
+-----+-----+
| Chetan Bhagan | India   |
| Morgan Housel | Australia |
+-----+-----+
2 rows in set (0.00 sec)
```

6. Find the publishers who are established in year 2015 as well as in 2016

```
mysql> SELECT * FROM publisher;
+-----+-----+-----+-----+
| publisher_no | publisher_name | publisher_addr | est_year |
+-----+-----+-----+-----+
| 1 | ABC Publication | Pune | 2015 |
| 2 | XYZ Publication | Mumbai | 2016 |
| 3 | Red Heart Publication | Kolkata | 2014 |
| 4 | Common Man Publication | Delhi | 2011 |
| 5 | VV Publication | Meghalaya | 2019 |
| 6 | ABC Publication | Pune | 2016 |
+-----+-----+-----+-----+
6 rows in set (0.00 sec)

mysql> SOURCE select.sql;
+-----+-----+
| publisher_name | est_year |
+-----+-----+
| ABC Publication | 2015 |
+-----+-----+
1 row in set (0.00 sec)
```

7. Find the book having maximum price and find titles of book having price between 300 and 400

```
mysql> source select.sql;
+-----+-----+-----+-----+-----+
| ISBN      | title           | unit_price | author_no | publisher_no | publ_year |
+-----+-----+-----+-----+-----+
| 678-901-234-567-8 | Lord Of The Rings |      1500 |         8 |          1 |     1999 |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

+-----+-----+
| title           | unit_price |
+-----+-----+
| Ikigai           |      320 |
| Radom           |      353 |
| Atomic Habits   |      380 |
| The Psycology of Money | 400 |
| The Alchemist    |      400 |
+-----+-----+
5 rows in set (0.00 sec)
```

8. Display all titles of books with price and published year in decreasing order of publishing year

```
mysql> source select.sql;
+-----+-----+-----+
| title           | unit_price | publ_year |
+-----+-----+-----+
| Radom           |      353 |     2015 |
| The Psycology of Money | 400 |     2006 |
| The Game of Thrones | 1100 |     2006 |
| Atomic Habits   |      380 |     2004 |
| Ikigai           |      320 |     2000 |
| Rich Dad and Poor Dad | 280 |     2000 |
| Lord Of The Rings | 1500 |     1999 |
| The Alchemist    |      400 |     1995 |
+-----+-----+-----+
8 rows in set (0.00 sec)
```

9. Display title,author_no and publisher_no of all books published in 2000,2004,2006

```
mysql> source select.sql;
+-----+-----+-----+
| title           | author_no | publisher_no |
+-----+-----+-----+
| Ikigai           |       1 |          1 |
| Atomic Habits   |       2 |          2 |
| The Psycology of Money | 3 |          3 |
| Rich Dad and Poor Dad | 4 |          4 |
| The Game of Thrones | 5 |          4 |
+-----+-----+-----+
5 rows in set (0.00 sec)
```

10. Display title,author_no and publisher_no of all books published in 2000,2004,2006

```
L mysql> source select.sql;
Query OK, 0 rows affected (0.02 sec)

L mysql> source select.sql;
+-----+-----+
| title          | author_name   |
+-----+-----+
| Ikigai         | Hector Garcia
| Atomic Habits | James Clear
| The Psychology of Money | Morgan Housel
| Rich Dad and Poor Dad | Robert Kiyosaki
| The Game of Thrones | George RR Martin
| Radom          | JK Rowling
| Lord Of The Rings | JRR Tolkien
| The Alchemist   | Paulo Coelho
+-----+
8 rows in set (0.01 sec)
```

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Conclusion:

Thus we have studied to use & implement
various DML queries.

