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Assignment No. 2

DOP :- 01-09-2021 DOS :- 07-09-2021

Title :- SQL Queries.

Problem Definition :-

a.) Design and Develop SQL DDL statements which demonstrate the use of SQL objects such as Table, view, Index, sequence, synonym, different constraint etc.

b.) Write at least 10 SQL queries on the suitable database application using SQL DML statements.

Learning Objectives :-

(i) Understand and implement the various DDL commands.

(ii) Understand database concept like view, index, sequence and synonym.

Learning Outcomes :-

students will be able to -

(i) Understand and implement the various DDL commands.

(ii) Understand database concept like view, index, sequence and synonym.

Theory :-

Queries :-

① **Create Database :**

Syntax : CREATE DATABASE database_name ;

Example : CREATE DATABASE student ;

This SQL statement creates database student.

② **Drop Database :**

syntax : DROP DATABASE database_name ;

Following SQL statement drops existing database student.

Example : DROP DATABASE student ;

③ **Create Table :**

create table statement is used to create a new table in a database.

Syntax :
```
CREATE TABLE tablename(
        column1 datatype,
        column2 datatype,
        ....
);
```

Example :
```
CREATE TABLE Persons(
    PersonID int,
    LastName varchar(20),
    FirstName varchar(20),
    Address varchar(50),
    City varchar(20));
```

④ **Drop Table :**

The Drop Table statement is used to drop an existing table in database.

Syntax : DROP TABLE table_name;

Example : DROP TABLE Persons;

⑤ **Alter Table :**

The Alter Table statement is used to add, delete or modify columns in an existing table.
The alter table statement is also used to add and drop various constraints on an existing table.

Syntax : ALTER TABLE table_name,
ADD Column_name datatype;

Example : ALTER TABLE Customers
ADD Email varchar (20);

MySQL constraints :-

SQL constraints are used to specify rules for data in table.
Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the table. If there is any violation between the constraint and the data action, the action is aborted. constraint can be column level or table level. Column level constraint apply to a column and table level constraint apply to the whole table.

The following constraint are commonly used in SQL.

(i) NOT NULL :- Ensures that a column cannot have a NULL value.

(ii) UNIQUE :- Ensures that all values in a column are different.

(iii) DEFAULT :- Sets a default value for a column if no value is specified.

(iv) CHECK :- Ensures that the values in a column satisfies a specific condition.

(v) FOREIGN KEY :- Prevents actions that would destroy links between tables.

(i) PRIMARY KEY :- A combination of NOT NULL and UNIQUE Uniquely identifies each row in a table.

Syntax :-

```
CREATE TABLE table_name (
    column1 datatype constraint,
    column2 datatype constraint,
    column3 datatype constraint,
    ---
);
```

Example :-

```
CREATE TABLE persons (
    ID int NOT NULL,
    Age int,
    UNIQUE (ID),
    CHECK (Age >= 18)
);
```

Primary key constraint :-

The primary key constraint uniquely identifies each record in a table.
primary key must contain UNIQUE values and cannot contain NULL values.
A table can have only ONE primary key and in the table this primary key can consist of single or multiple columns.

Example:
```
CREATE TABLE Persons (
    ID int NOT NULL,
    FirstName varchar(25),
    Age int,
    PRIMARY KEY (ID)
);
```

Foreign key constraint :-

The foreign key constraint is used to prevent actions that would destroy links between tables.
A foreign key is field in one table, that refers to the primary key in another table.

The table with the foreign key is called the child table and the table with the primary key is called the referenced or parent table.
Example:
```
CREATE TABLE Persons (
    PersonID int NOT NULL PRIMARY KEY,
    FirstName varchar(25),
    Age int
);
```

```
CREATE TABLE Orders (
    OrderID int NOT NULL,
    OrderNo int NOT NULL,
    PersonID int,
    PRIMARY KEY (OrderID),
    FOREIGN KEY (PersonID) REFERENCES Persons(PersonID)
);
```

MySQL Views :-

In SQL, a view is a virtual table based on the result-set of an SQL statement.
A view contains rows and columns, just like a real table. The fields in a view are fields from one or more real tables in a database.
You can add SQL statements and functions to a view and present the data as if the data were coming from one single table.

① CREATE VIEW :-

Syntax :-
```
CREATE VIEW view_name AS
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

Example :-
```
CREATE VIEW [Brazil Customers] AS
SELECT CustomerName, ContactName
FROM Customers
WHERE Country = 'Brazil';
```

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(ii) DROP VIEW :-

A view is deleted with the DROP VIEW statement

Syntax :- DROP VIEW view_name ;

Example :- DROP VIEW [Brazil Customers] ;

MySQL Queries :-

(1) SELECT Statement :-

The select statement is used to select data from a database.

The data returned is stored in a result table, called ~~to~~ the result-set.

Syntax :- SELECT column1, column2, ...
FROM table_name ;

Example :- SELECT * FROM table_name ;

This statement selects all the columns from table_name.

(2) WHERE clause :-

The where clause is used to filter records. It is used to extract only those records that fulfill a specified condition.

Syntax :- SELECT column1, column2, ...
FROM tablename
where condition ;

Example :- SELECT * FROM Customers
WHERE country = 'Mexico' ;

(3) AND, OR Operators :-

The where clause can be combined with AND, OR operators.

The AND and OR operators are used to filter records based on more than one condition.

AND operator displays a record if all the conditions separated by AND are TRUE.

AND Syntax :-
```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 AND condition2, --;
```

OR Syntax :-
```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 OR condition2, ...;
```

Example :-

(i)
```
SELECT * FROM Customers
WHERE Country = 'Germany' AND City = 'Berlin';
```

(ii)
```
SELECT * FROM Customers
WHERE City = 'Berlin' OR City = 'Stuttgart';
```

(4) ORDER BY keyword :-

The ORDER BY keyword is used to sort the result-set in ascending or desrending order.

The ORDER BY keyword sorts the records in ascending order by default. To sort the records in desrending order use the DESC keyword.

Syntax :- SELECT column1, column2, ...
FROM tablename
ORDER BY column1, column2, ... ASC/DESC;

Example :- SELECT * FROM Customers
ORDER BY Country DESC;

(5) INSERT INTO statement :-

The insert into statement is used to insert new records in table.

Syntax :- INSERT INTO tablename (column1, column2, ...)
VALUES (value1, value2, ...)

Example :- INSERT INTO Customers (CustomerName, City, Country)
VALUES ('cardinal', 'Mumbai', 'India')

(6) UPDATE statement :-

The UPDATE statement is used to modify the existing records in a table.

Syntax :- UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;

Example :-
UPDATE Customers
SET PostalCode = 0000
WHERE Country = 'Mexico';

⑦ DELETE Statement :-

The DELETE Statement is used to delete existing records in table.

Syntax :- DELETE FROM tablename WHERE condition ;

Example :- DELETE FROM Customers WHERE City = 'Delhi' ;

⑧ MAX() Function :-

The MAX() function returns the largest value of the selected column.

Syntax :- SELECT MAX (column_name)
FROM tablename
WHERE condition ;

Example :- SELECT MAX(Price) AS LargestPrice
FROM Products ;

⑨ LIKE Operator :-

The LIKE operator is used in a WHERE clause to search for specified patterns in a column.

(i) The percentage sign (%) represent zero, one or multiple characters.

(ii) The underscore sign (_) represent one, single character.

Syntax :- SELECT column1, column2, . .
FROM table_name
WHERE columnN LIKE pattern ;

Example:- Selects all customers with a CustomerName starting with "a"

```
SELECT * FROM Customers
WHERE CustomerName LIKE 'a%';
```

(10) IN Operator :-

The IN Operator allows you to specify multiple values in WHERE clause.

Syntax:-
```
SELECT column_name(s)
FROM tablename
WHERE column_name IN (value1, value2, ...)
```

Example:-
```
SELECT * FROM Customers
WHERE Country IN ('Germany', 'France');
```

(11) BETWEEN Operator :-

The BETWEEN Operator selects values within a given range. The values can be numbers, text or dates. The BETWEEN Operator is inclusive: begin and end are included.

Syntax:-
```
SELECT column_name(s)
FROM tablename
WHERE column_name BETWEEN value1 AND value2;
```

Example:-
```
SELECT * FROM Products
WHERE Price BETWEEN 10 AND 20;
```

(12) Aliases :-

Aliases are used to give a table, or a column in a table, a temporary name.
An aliases is created with the As keyword.

Syntax :- SELECT column_name AS alias_name
FROM table_name;

Example :- SELECT CustomerID AS ID
FROM Customers;

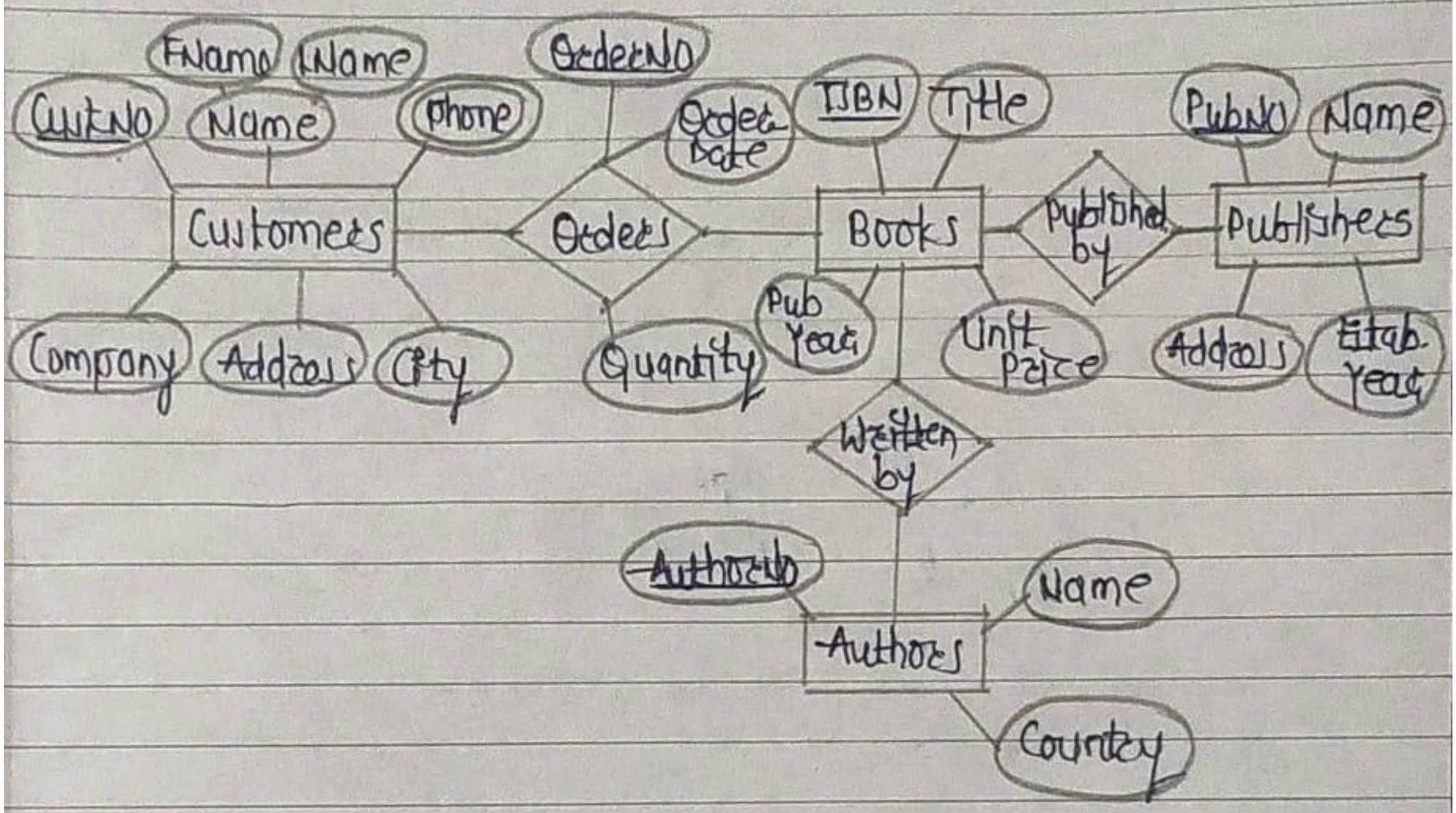
(13) UNION Operator :-

The UNION Operator is used to combine the result-set of two or more select statements.

Syntax :-
SELECT column_name(s) FROM table1
UNION
SELECT column_name(s) FROM table2;

Example :-
SELECT City FROM Customers
UNION
SELECT City FROM Suppliers
ORDER BY City;

ER Diagram :-



Conclusion :-

We have studied to use and implement various DML Queries.

OUTPUT :-

-- 1. Insert at least 10 records in customer table and insert other tables accordingly

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
100	Vidyut	Ambekar	Microsoft	Kothrud	Pune	945612347
200	Pratap	Deshmukh	Google	Nariman Point	Mumbai	987425613
300	Kailash	Chandekar	Oracle	Collector Office Area	Ahmednagar	784562143
400	Mukund	Bapat	Kimberly-Clark	Panchawati	Nashik	887425631
500	Girish	Deshpande	Tyson Foods	Cidco	Aurangabad	914628746
600	Neeraj	Kulkarni	SC Johnson	Kandivili West	Mumbai	964782348
700	Prashant	Gavaskar	Dole Foods	Gorepeth	Nagpur	983214569
800	Raj	Bhede	Flowers foods	Gangapur Road	Nashik	964782555
900	Hari	Holkar	Electronic Arts	Hadapsar	Pune	904258371
991	Aditya	Kamble	Starbucks	Shahgunj	Aurangabad	952764813

Author_no	Author_name	Author_Country
1001	Singh	India
1103	Smith	Australia
1264	Kaur	India
1300	Patel	India
1311	Jones	Australia
1423	Kumar	India
1533	Wilson	England
1604	Johnson	Australia
1911	Kumar	India
1956	Narayan	India

ISBN	Title	Unit_Price	Author_no	Publisher_no	Pub_year
9134-64-11-3	The October Country	480.46	1423	13254	2015
924-295-266-0	The Radiance of Pigs	255	1264	10344	2003
955-200-393-8	The Art of Drowning	178.61	1311	12664	2005
960-245-155-0	House of Leaves	313.2	1911	15332	2004
960-245-156-0	Wuthering Heights	333.24	1533	12964	2010
98134-20-77-5	Wide Sargasso Sea	220.4	1956	16456	2006
99134-64-11-2	Full Darks, No Stars	425.5	1300	10444	2004
99134-64-11-3	The Lives of the Heart	142.56	1001	10486	2000
99144-66-21-9	Of Mice and Men	150	1604	14256	2015
99214-43-11-2	A Ring of Endless Light	346.33	1103	10524	2001

Order_No	Customer_No	ISBN	Quantity	Order_Date
1008	700	99134-64-11-3	1	2019-01-13
1009	300	99214-43-11-2	2	2019-04-05
1010	100	924-295-266-0	1	2019-10-25
1011	991	99134-64-11-2	3	2020-02-15
1012	900	955-200-393-8	2	2020-03-21
1013	700	9134-64-11-3	1	2020-06-15
1014	200	960-245-156-0	4	2020-09-11
1015	800	99144-66-21-9	1	2021-05-10
1016	500	960-245-156-0	2	2021-07-17
1017	600	98134-20-77-5	1	2021-08-10

Publisher_No	Publisher_Name	Publisher_Addr	estab_year
10344	Best Progress	Hartford Avenue, Bellingham	2016
10444	Famous Publications	Oak Street, Brockton	2011
10486	Prime Publications	Brockton Avenue, Abington	2004
10524	Mercury Books	Memorial Drive, Avon	2010
12664	Publishing Exports	Parkhurst Rd, Chelmsford	2015
12964	24 Hours Publishers	Brooksby Village Way, Danvers	2018
13254	The Writing Gurus	Memorial Dr, Chicopee	2017
14256	Prospect Park Books	Teaticket Hwy, East Falmouth	2015
15332	Radical Publish Shop	Fairhaven Commons Way, Fairhaven	2020
16456	Rare Bird Books	William S Canning Blvd, Fall River	2016

-- 2. Display all customer details with city pune or mumbai and customer first - - name starting with 'p' or 'h'.

```
SELECT * FROM Customers
 WHERE Customer_City IN('Pune', 'Mumbai')
    AND Customer_FName LIKE 'P%' OR Customer_FName LIKE 'H%';
```

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
200	Pratap	Deshmukh	Google	Nariman Point	Mumbai	987425613
900	Hari	Holkar	Electronic Arts	Hadapsar	Pune	904258371

-- 3. lists the number of different customer cities.(use of distinct)

SELECT DISTINCT Customer_City FROM Customers;

Customer_City
Ahmednagar
Aurangabad
Mumbai
Nagpur
Nashik
Pune

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

(use of update)

SELECT ISBN, Title, Unit_Price, (Unit_Price + 0.05*Unit_Price) AS New_Price
FROM Books
WHERE Pub_year = 2015;

ISBN	Title	Unit_Price	New_Price
9134-64-11-3	The October Country	480.46	504.48299102783204
99144-66-21-9	Of Mice and Men	150	157.5

-- 5. Delete customer details living in pune.

DELETE FROM Customers WHERE Customer_City = 'Pune';

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
200	Pratap	Deshmukh	Google	Nariman Point	Mumbai	987425613
300	Kailash	Chandekar	Oracle	Collector Office Area	Ahmednagar	784562143
400	Mukund	Bapat	Kimberly-Clark	Panchawati	Nashik	887425631
500	Girish	Deshpande	Tyson Foods	Cidco	Aurangabad	914628746
600	Neeraj	Kulkarni	SC Johnson	Kandivili West	Mumbai	964782348
700	Prashant	Gavaskar	Dole Foods	Gorepeth	Nagpur	983214569
800	Raj	Bhede	Flowers foods	Gangapur Road	Nashik	964782555
991	Aditya	Kamble	Starbucks	Shahgunj	Aurangabad	952764813

-- 6. Find the names of authors living in India or Australia (use of UNION)

```
SELECT Author_name, Author_Country FROM Authors
 WHERE Author_Country = 'India'
 UNION ALL
 SELECT Author_name, Author_Country FROM Authors
 WHERE Author_Country = 'Australia';
```

Author_name	Author_Country
Singh	India
Kaur	India
Patel	India
Kumar	India
Kumar	India
Narayan	India
Smith	Australia
Jones	Australia
Johnson	Australia

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

SELECT Publisher_Name, estab_year FROM Publishers
 WHERE estab_year IN (2015, 2016);

Publisher_Name	estab_year
Best Progress	2016
Publishing Exports	2015
Prospect Park Books	2015
Rare Bird Books	2016

-- 8. Find the book having maximum price and find titles of book having price -- - between 300 and 400.(use of max and between)

SELECT Title, MAX(Unit_Price) AS Max_Price FROM Books;

Title	Max_Price
The October Country	480.46

SELECT Title, Unit_Price FROM Books
 WHERE Unit_Price BETWEEN 300 AND 400;

Title	Unit_Price
House of Leaves	313.2
Wuthering Heights	333.24
A Ring of Endless Light	346.33

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

```
SELECT Title, Unit_Price, Pub_year FROM Books
 ORDER BY Pub_year DESC;
```

Title	Unit_Price	Pub_year
The October Country	480.46	2015
Of Mice and Men	150	2015
Wuthering Heights	333.24	2010
Wide Sargasso Sea	220.4	2006
The Art of Drowning	178.61	2005
House of Leaves	313.2	2004
Full Darks, No Stars	425.5	2004
The Radiance of Pigs	255	2003
A Ring of Endless Light	346.33	2001
The Lives of the Heart	142.56	2000

-- 10. Display title,author_no and publisher_no of all books published in 2000,
-- 2004, 2006. (use of IN)

```
SELECT Title, Author_no, Publisher_no, Pub_year FROM Books
 WHERE Pub_year IN (2000, 2004, 2006);
```

Title	Author_no	Publisher_no	Pub_year
House of Leaves	1911	15332	2004
Wide Sargasso Sea	1956	16456	2006
Full Darks, No Stars	1300	10444	2004
The Lives of the Heart	1001	10486	2000

-- 11.Create view showing the books and authors details. (COMPLEX VIEW)

```
CREATE VIEW Title_Authors
 AS SELECT B.Title, A.Author_name
 FROM Books B , Authors A
    WHERE B.Author_no = A.Author_no;

SELECT * FROM Title_Authors;
```

Title	Author_name
The October Country	Kumar
The Radiance of Pigs	Kaur
The Art of Drowning	Jones
House of Leaves	Kumar
Wuthering Heights	Wilson
Wide Sargasso Sea	Narayan
Full Darks, No Stars	Patel
The Lives of the Heart	Singh
Of Mice and Men	Johnson
A Ring of Endless Light	Smith

-- INDEX :-

-- A] Simple Index :-

```
CREATE INDEX Sim_Cust_indx ON Customers(Customer_city);

SELECT * FROM Customers USE INDEX(Sim_Cust_indx)
 WHERE Customer_city = 'Mumbai';
```

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
200	Pratap	Deshmukh	Google	Nariman Point	Mumbai	987425613
600	Neeraj	Kulkarni	SC Johnson	Kandivili West	Mumbai	964782348

-- B] Composite Index :-

```
CREATE INDEX Com_Cust_indx ON
Customers(Customer_Company,Customer_City);

SELECT * FROM Customers USE INDEX(Com_Cust_indx)
 WHERE Customer_city = 'Mumbai'and Customer_Company = 'Google';
```

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
200	Pratap	Deshmukh	Google	Nariman Point	Mumbai	987425613

-- C] Unique Index :-

```
CREATE UNIQUE INDEX Uniq_Cust_indx ON Customers(Customer_No);

SELECT * FROM Customers USE INDEX(Uniq_Cust_indx)
WHERE Customer_Phone = 952764813;
```

Customer_No	Customer_FName	Customer_LName	Customer_Company	Customer_Address	Customer_City	Customer_Phone
991	Aditya	Kamble	Starbucks	Shahgunj	Aurangabad	952764813

-- SEQUENCE :–

```
CREATE TABLE Persons(
 P_Number INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
 RollNo INT,
 P_Name VARCHAR(5)
 );
 ALTER TABLE Persons AUTO_INCREMENT = 50;

 INSERT INTO Persons (RollNo, P_Name) VALUES
 (11, 'A'),
```

(12, 'B'),
(13, 'C');

SELECT * FROM Persons;

P_Number	RollNo	P_Name
50	11	A
51	12	B
52	13	C

-- SYNONYM :–

CALL SYS.CREATE_SYNONYM_DB('assignment_no_2', 'db_2');