DATA BASE MANAGEMENT SYSTEM

LAB PRACTICAL FILE

(DBMS LAB MANUAL)

SCHOOL OF COMPUTER APPLICATIONS

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PROGRAME	:	BCA-GENERAL
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BATCH	:	2024-25
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# INTRODUCTION TO SQL :

--SQL (STRUCTURED QUERY LANGUAGE) !

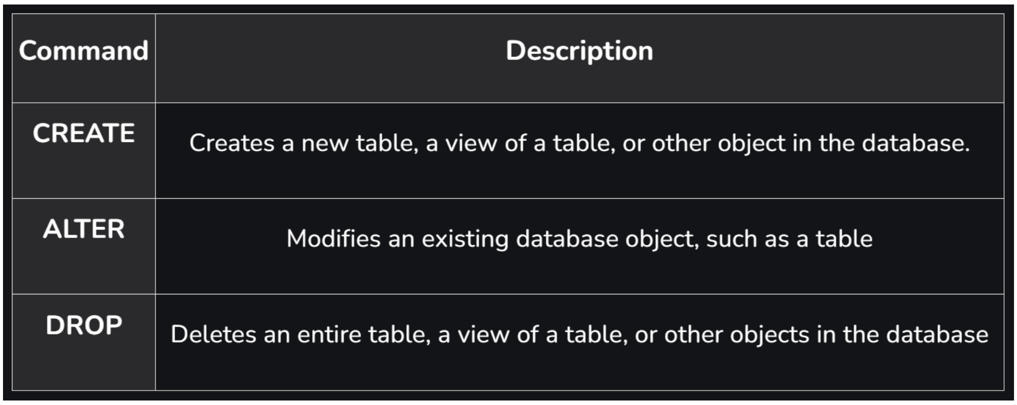
SQL (Structured Query Language) is a specialized programming language designed for managing and manipulating data stored in relational databases. It allows users to perform various operations such as querying, updating, inserting, and deleting data efficiently in databases

--Why SQL?

- The basic use of SQL for data professionals and SQL users is to insert, update, and delete the data from the relational database.
- SQL allows the data professionals and users to retrieve the data from the relational database management systems.
- It also helps them to describe the structured data.
- It allows SQL users to create, drop, and manipulate the database and its tables.

--Key Principles of SQL !

- Data Query Language (DQL): Used for querying data (e.g., SELECT).
- Data Definition Language (DDL) :Used for defining database structures (e.g., CREATE, ALTER, DROP).



Command	Description
CREATE	Creates a new table, a view of a table, or other object in the database.
ALTER	Modifies an existing database object, such as a table
DROP	Deletes an entire table, a view of a table, or other objects in the database

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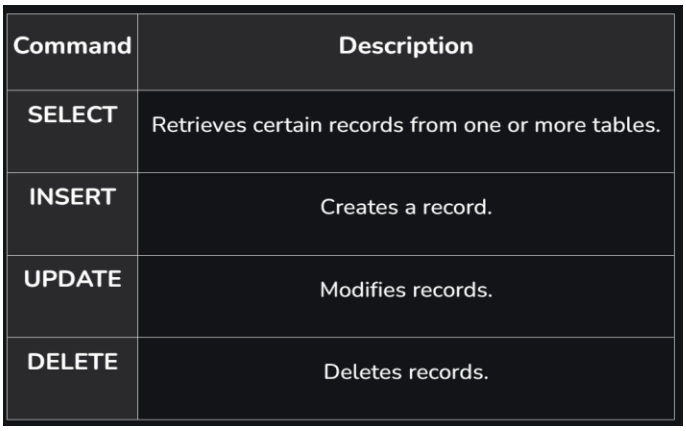
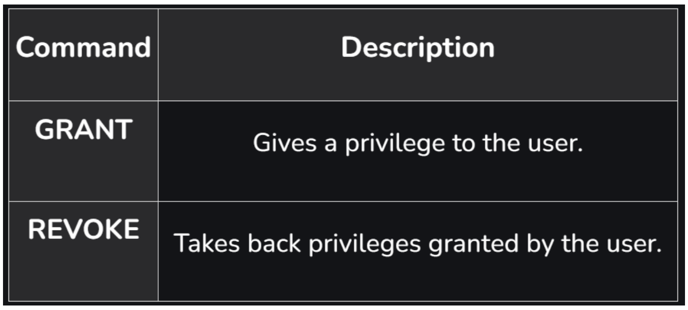
- Data Manipulation Language (DML): Used for manipulating data (e.g., INSERT, UPDATE, DELETE).



Command	Description
SELECT	Retrieves certain records from one or more tables.
INSERT	Creates a record.
UPDATE	Modifies records.
DELETE	Deletes records.

- Data Control Language (DCL): Used for controlling access to data (e.g., GRANT, REVOKE) .



Command	Description
GRANT	Gives a privilege to the user.
REVOKE	Takes back privileges granted by the user.

--SQL data types !

- Numeric Datatypes :

✓ INT: Integer numbers, e.g., 1, 100, -20.
✓ DECIMAL (p, s) or NUMERIC: Fixed precision numbers with specified digits after the decimal.
✓ FLOAT and REAL: For floating-point numbers (decimal numbers with variable precision).

- Date and Time Datatypes :

✓ CHAR(n): Fixed-length strings (e.g., CHAR(10) reserves 10 characters).
✓ VARCHAR(n): Variable-length strings (e.g., VARCHAR(50) allows up to 50 characters).
✓ TEXT: Large amounts of text

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- String Datatypes :

✓ DATE: Stores date values (year, month, day).
✓ TIME: Stores time values (hours, minutes, seconds).
✓ DATETIME: Stores both date and time values.
✓ TIMESTAMP: Stores date and time with time zone info.

- Binary data type :

  ✓ BOOLEAN: Stores true/false values.

- Boolean data type :

  ✓ BLOB: Stores binary data, often used for images or files.

Experiment : 01

1 : Create the following tables :

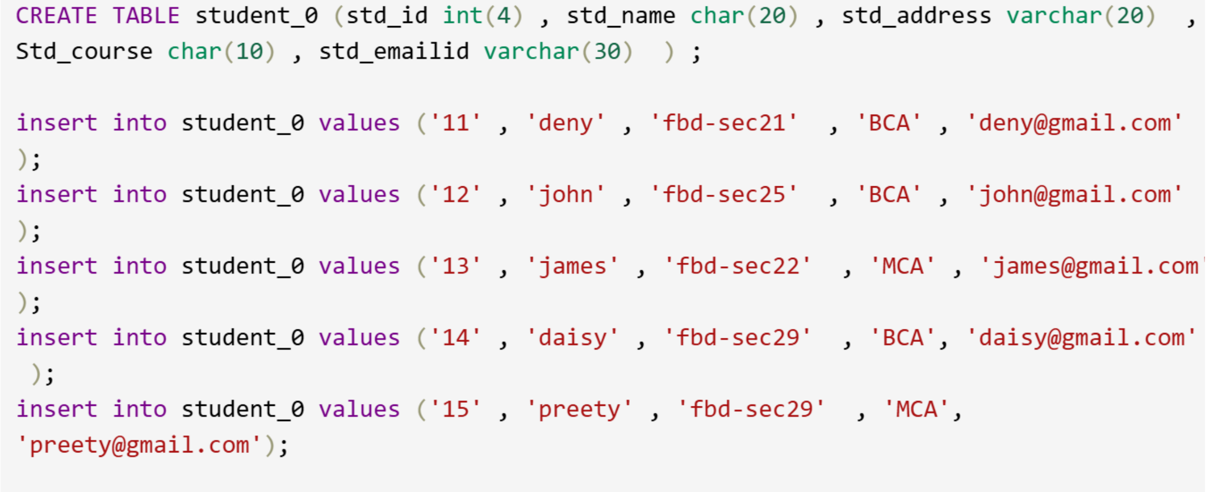
Student_table :

Column_name	Data type	size	constraint
StudentId	Number	4	Primary key
studentname	Varchar2	40	Null
Address1	Varchar2	300	
Gender	Varchar2	15	
Course	Varchar2	8	

Course_table :

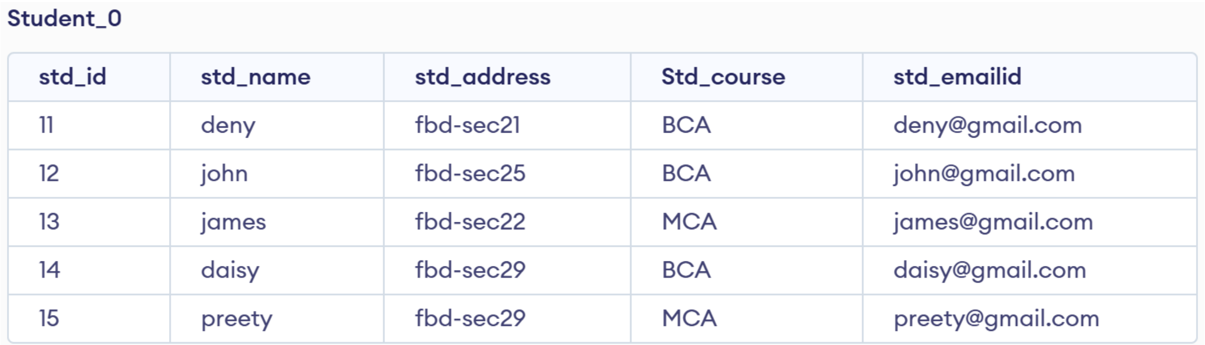
Dept No	Number	2	constraint
Dname	varchar	20	Primary key
Location	varchar	10	

1: Insert five records for each table :



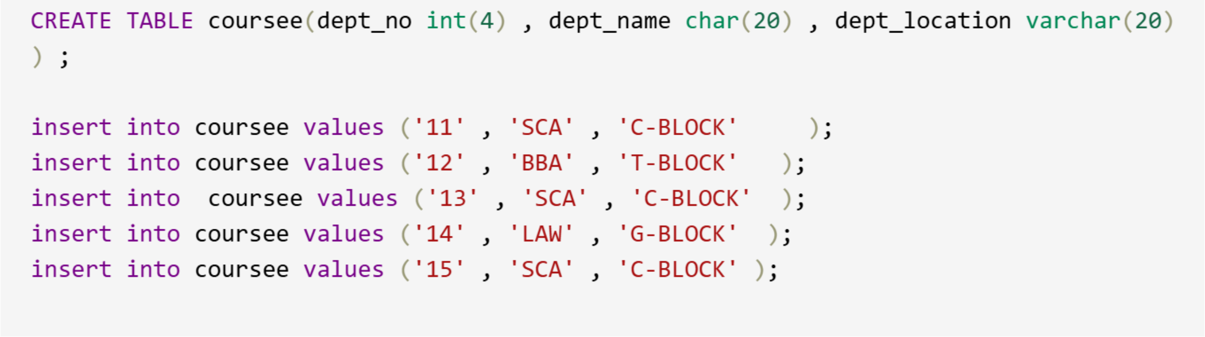
```
CREATE TABLE student_0 (std_id int(4) , std_name char(20) , std_address varchar(20)  ,
Std_course char(10) , std_emailid varchar(30)  ) ;

insert into student_0 values ('11' , 'deny' , 'fbd-sec21'  , 'BCA' , 'deny@gmail.com'
);
insert into student_0 values ('12' , 'john' , 'fbd-sec25'  , 'BCA' , 'john@gmail.com'
);
insert into student_0 values ('13' , 'james' , 'fbd-sec22'  , 'MCA' , 'james@gmail.com'
);
insert into student_0 values ('14' , 'daisy' , 'fbd-sec29'  , 'BCA', 'daisy@gmail.com'
 );
insert into student_0 values ('15' , 'preety' , 'fbd-sec29'  , 'MCA',
'preety@gmail.com');
```



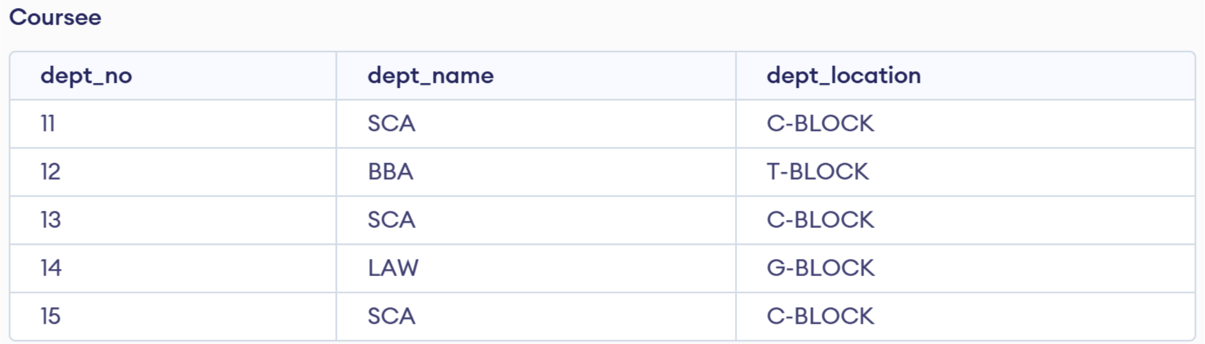
Student_0

std_id	std_name	std_address	Std_course	std_emailid
11	deny	fbd-sec21	BCA	deny@gmail.com
12	john	fbd-sec25	BCA	john@gmail.com
13	james	fbd-sec22	MCA	james@gmail.com
14	daisy	fbd-sec29	BCA	daisy@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com



```
CREATE TABLE coursee(dept_no int(4) , dept_name char(20) , dept_location varchar(20)
) ;

insert into coursee values ('11' , 'SCA' , 'C-BLOCK'     );
insert into coursee values ('12' , 'BBA' , 'T-BLOCK'   );
insert into  coursee values ('13' , 'SCA' , 'C-BLOCK'  );
insert into coursee values ('14' , 'LAW' , 'G-BLOCK'  );
insert into coursee values ('15' , 'SCA' , 'C-BLOCK' );
```



Coursee

dept_no	dept_name	dept_location
11	SCA	C-BLOCK
12	BBA	T-BLOCK
13	SCA	C-BLOCK
14	LAW	G-BLOCK
15	SCA	C-BLOCK

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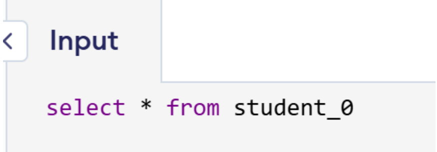
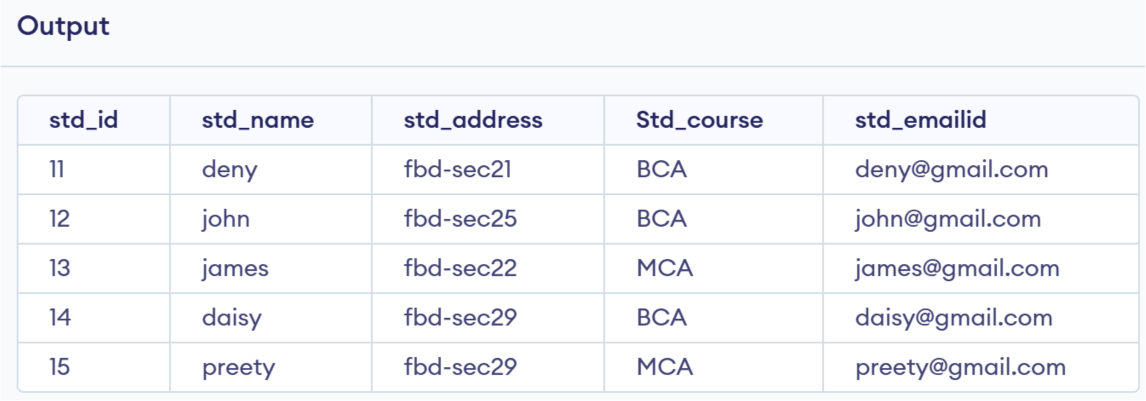
2. List all information about all students from student table:



Input

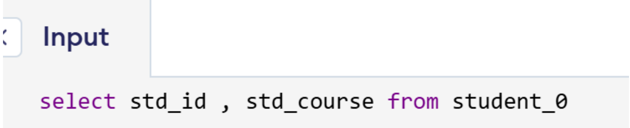
```
select * from student_0
```



Output

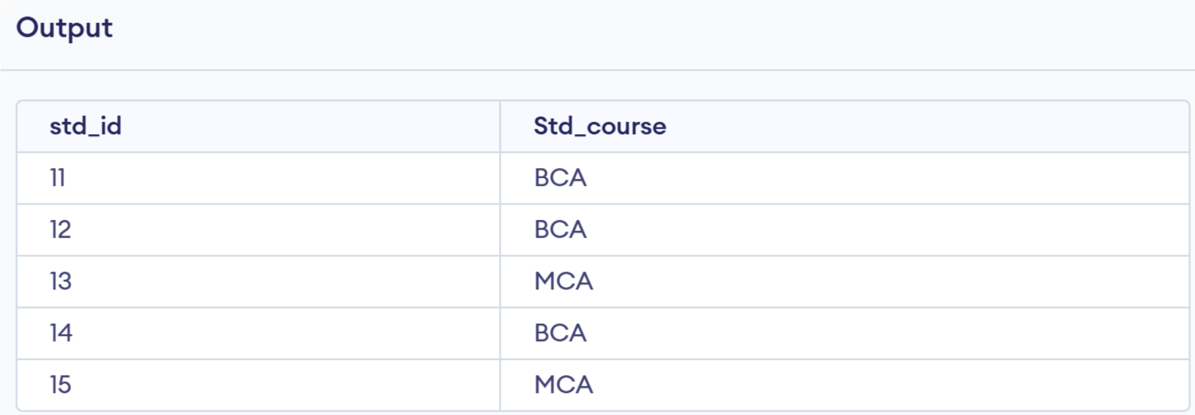
std_id	std_name	std_address	Std_course	std_emailid
11	deny	fbd-sec21	BCA	deny@gmail.com
12	john	fbd-sec25	BCA	john@gmail.com
13	james	fbd-sec22	MCA	james@gmail.com
14	daisy	fbd-sec29	BCA	daisy@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com

3. List all student numbers along with their Courses :



Input

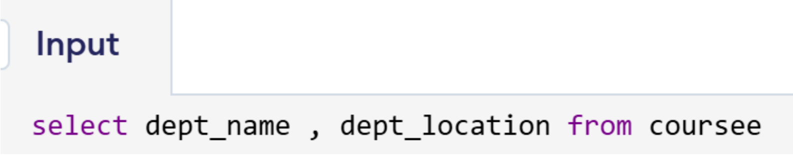
```
select std_id , std_course from student_0
```



Output

std_id	Std_course
11	BCA
12	BCA
13	MCA
14	BCA
15	MCA

4. List Course names and locations from the Course table :



Input

```
select dept_name , dept_location from coursee
```

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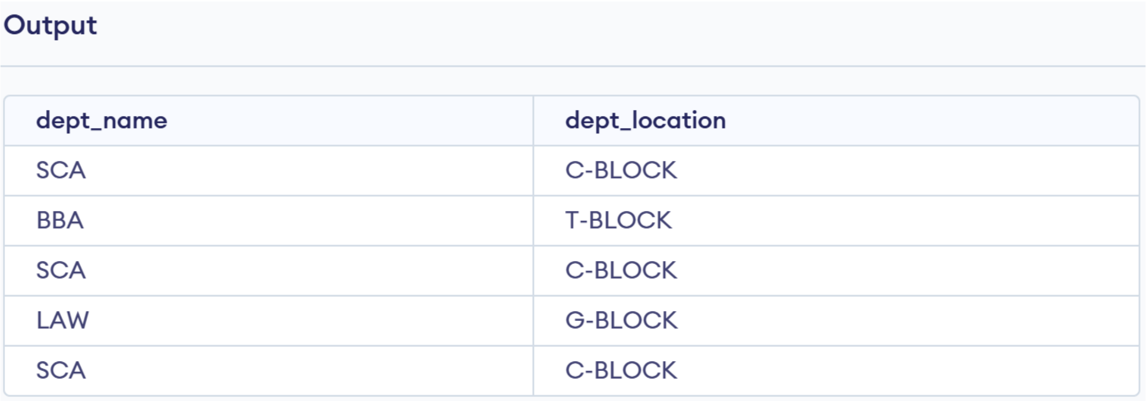
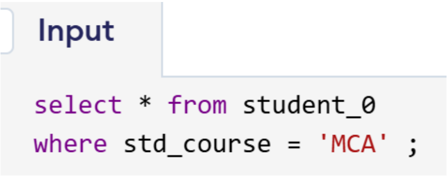


Output

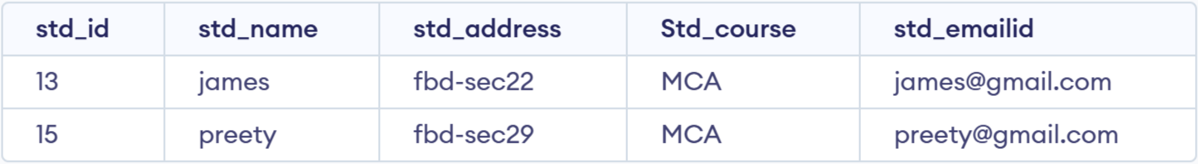
dept_name	dept_location
SCA	C-BLOCK
BBA	T-BLOCK
SCA	C-BLOCK
LAW	G-BLOCK
SCA	C-BLOCK

5. List the details of the Students in MCA Course :



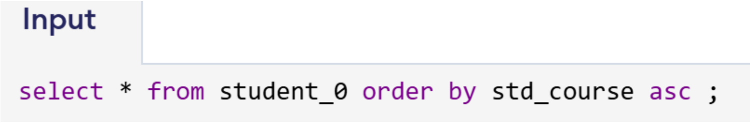
Input

```
select * from student_0
where std_course = 'MCA' ;
```



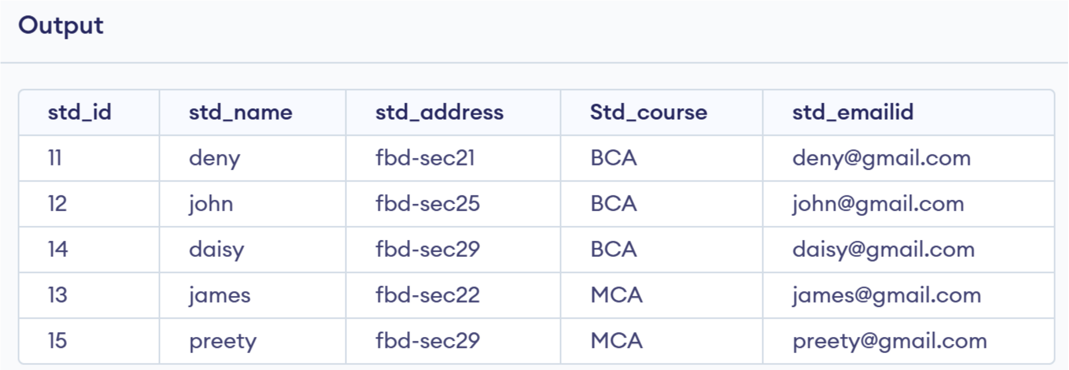
std_id	std_name	std_address	Std_course	std_emailid
13	james	fbd-sec22	MCA	james@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com

6. List the students details in ascending order of course :



Input

```
select * from student_0 order by std_course asc ;
```



Output

std_id	std_name	std_address	Std_course	std_emailid
11	deny	fbd-sec21	BCA	deny@gmail.com
12	john	fbd-sec25	BCA	john@gmail.com
14	daisy	fbd-sec29	BCA	daisy@gmail.com
13	james	fbd-sec22	MCA	james@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com

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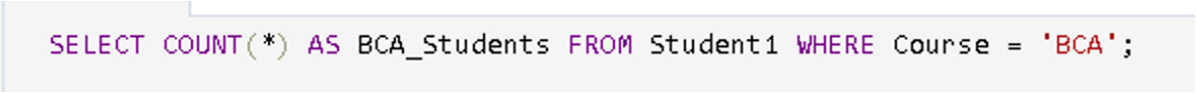
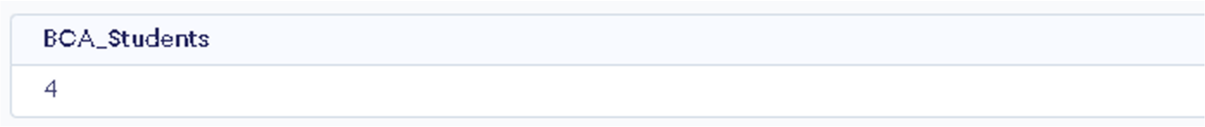
7. List the number of Students in BCA course :

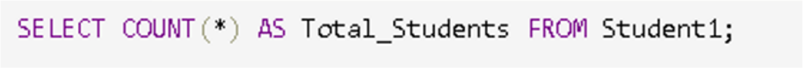


```
SELECT COUNT(*) AS BCA_Students FROM Student1 WHERE Course = 'BCA';
```

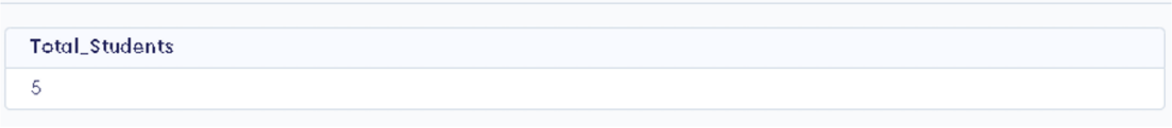


BCA_Students
4

8. List the number of students available in student table .

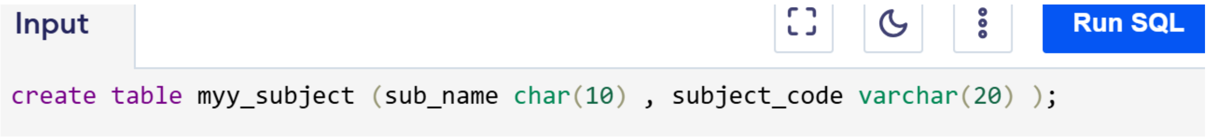


```
SELECT COUNT(*) AS Total_Students FROM Student1;
```

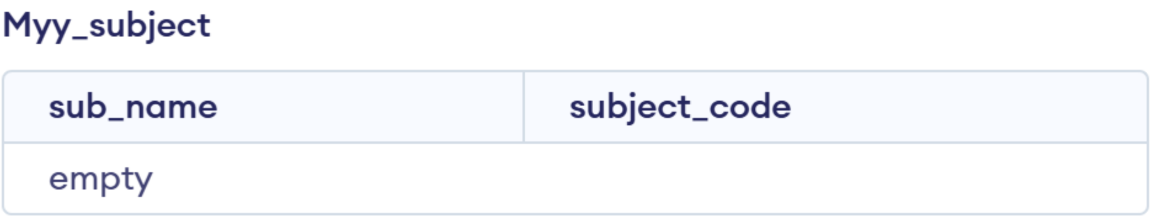


Total_Students
5

9. Create a table with a primary key constraint.



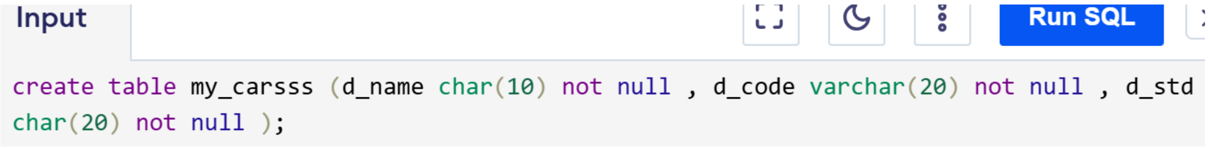
```
create table myy_subject (sub_name char(10) , subject_code varchar(20) );
```



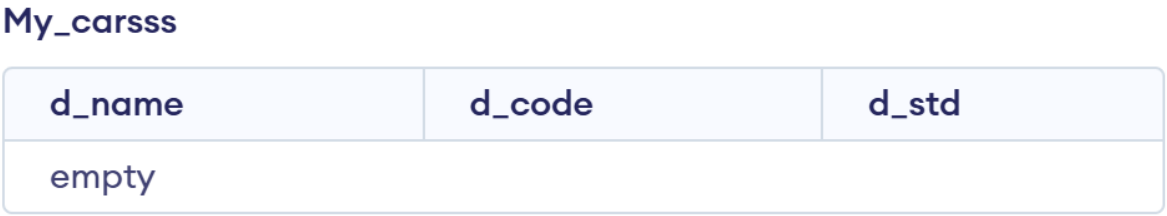
Myy_subject

sub_name	subject_code
empty	

10. Create a table with all column having not null constraints .



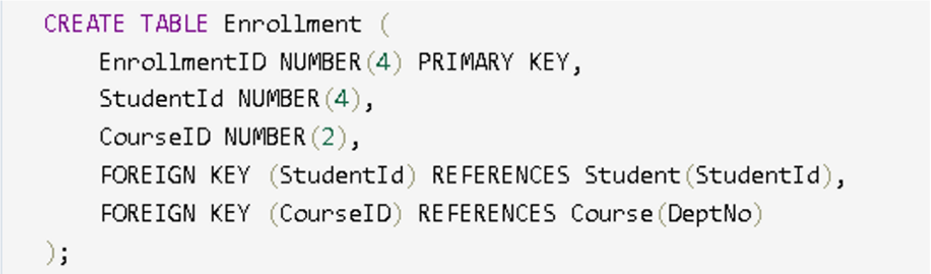
```
create table my_carsss (d_name char(10) not null , d_code varchar(20) not null , d_std
char(20) not null );
```



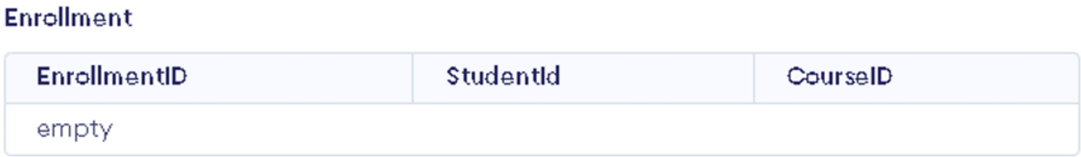
My_carsss

d_name	d_code	d_std
empty		

11. Create a foreign key constraint in a table .



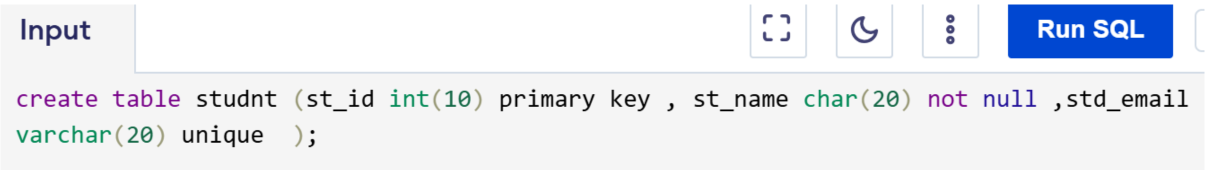
```
CREATE TABLE Enrollment (
    EnrollmentID NUMBER(4) PRIMARY KEY,
    StudentId NUMBER(4),
    CourseID NUMBER(2),
    FOREIGN KEY (StudentId) REFERENCES Student(StudentId),
    FOREIGN KEY (CourseID) REFERENCES Course(DeptNo)
);
```



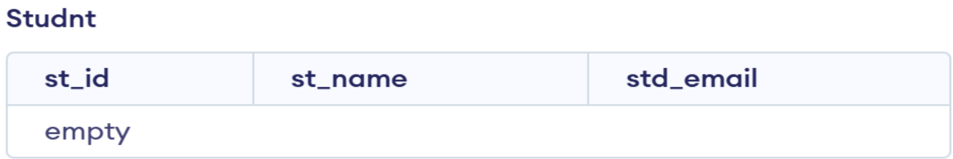
Enrollment

EnrollmentID	StudentId	CourseID
empty		

12. Create a Table with a unique key constraint .



```
create table studnt (st_id int(10) primary key , st_name char(20) not null ,std_email
varchar(20) unique  );
```



Studnt

st_id	st_name	std_email
empty		

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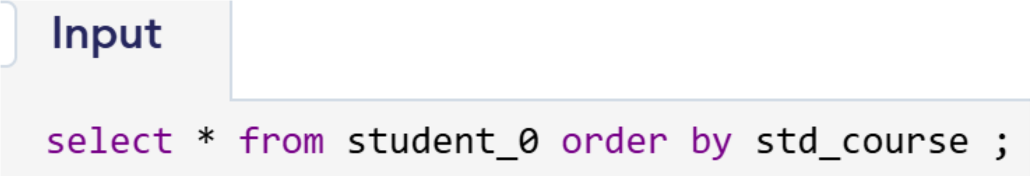
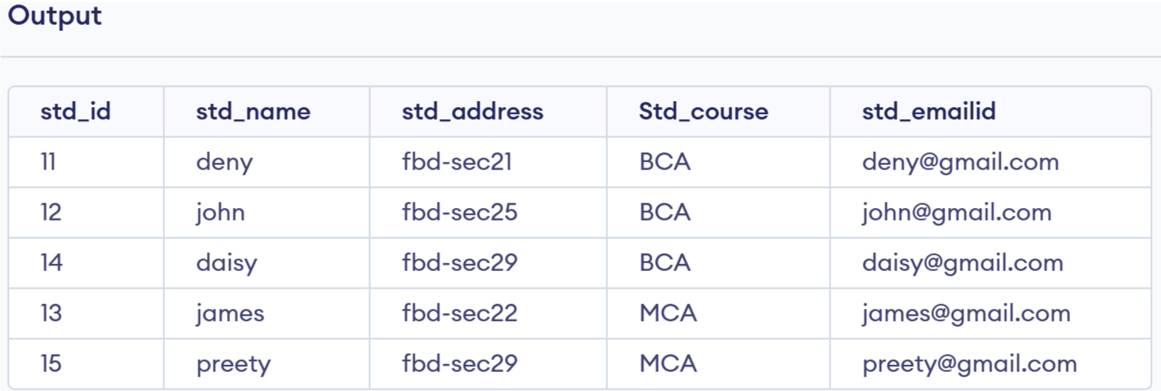
13. Display list of student ordered by course .



Input

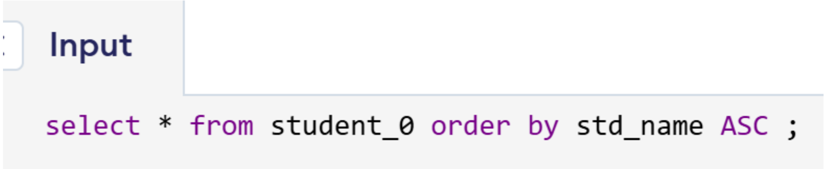
```
select * from student_0 order by std_course ;
```



Output

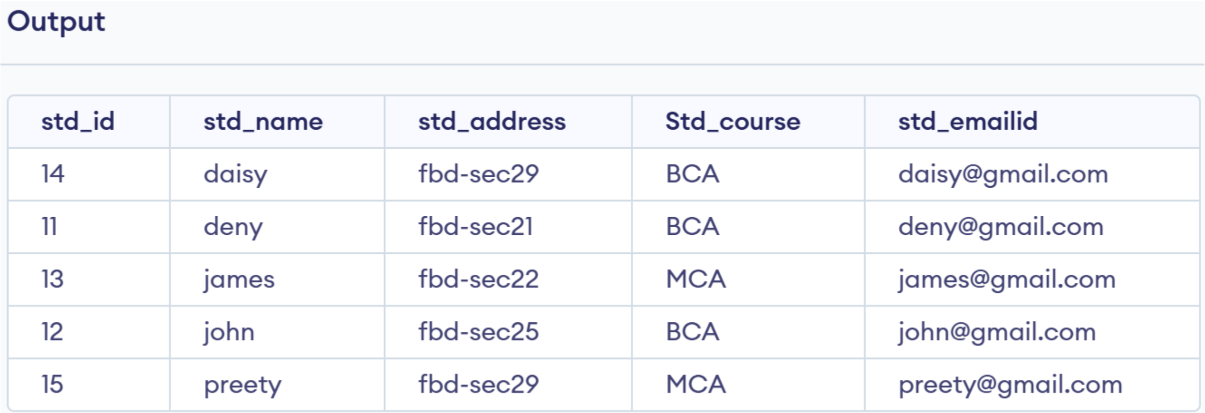
std_id	std_name	std_address	Std_course	std_emailid
11	deny	fbd-sec21	BCA	deny@gmail.com
12	john	fbd-sec25	BCA	john@gmail.com
14	daisy	fbd-sec29	BCA	daisy@gmail.com
13	james	fbd-sec22	MCA	james@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com

14. Display alphabetically sorted list of students .



Input

```
select * from student_0 order by std_name ASC ;
```



Output

std_id	std_name	std_address	Std_course	std_emailid
14	daisy	fbd-sec29	BCA	daisy@gmail.com
11	deny	fbd-sec21	BCA	deny@gmail.com
13	james	fbd-sec22	MCA	james@gmail.com
12	john	fbd-sec25	BCA	john@gmail.com
15	preety	fbd-sec29	MCA	preety@gmail.com

Experiment : 2

Q1: Create the following tables :

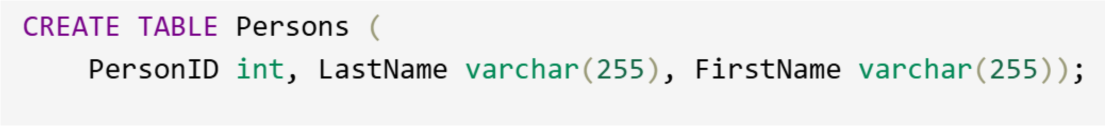
Customer :

SID	**Primary key**
Last_Name	
First_Name	

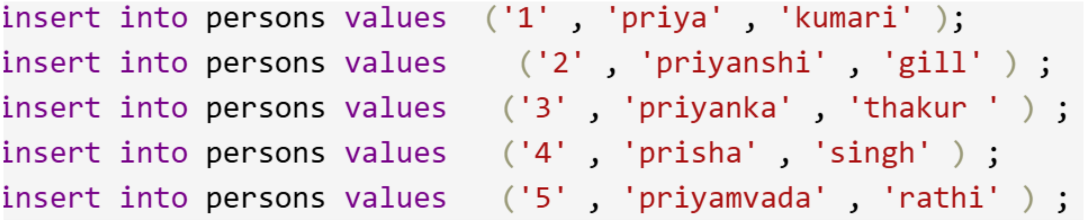
Orders :

Order_ID	**Primary key**
Order_Date	
Customer_sid	**Foreign key**
Amount	**Check > 20000**

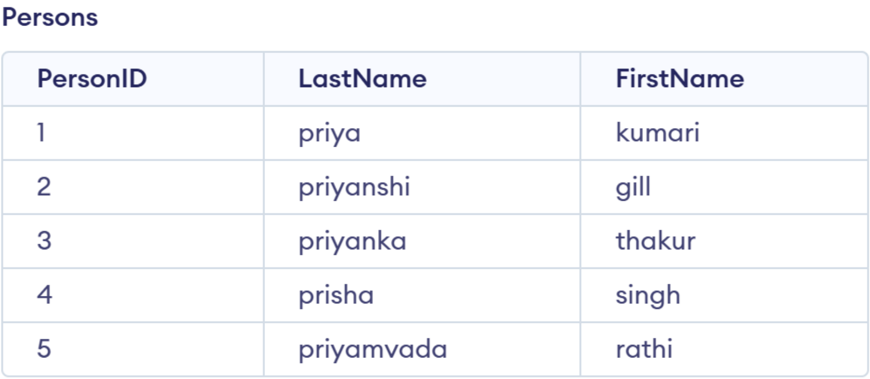
1: Insert five records for each table .



```
CREATE TABLE Persons (
    PersonID int, LastName varchar(255), FirstName varchar(255));
```



```
insert into persons values  ('1' , 'priya' , 'kumari' );
insert into persons values    ('2' , 'priyanshi' , 'gill' ) ;
insert into persons values   ('3' , 'priyanka' , 'thakur ' ) ;
insert into persons values   ('4' , 'prisha' , 'singh' ) ;
insert into persons values   ('5' , 'priyamvada' , 'rathi' ) ;
```



Persons

PersonID	LastName	FirstName
1	priya	kumari
2	priyanshi	gill
3	priyanka	thakur
4	prisha	singh
5	priyamvada	rathi

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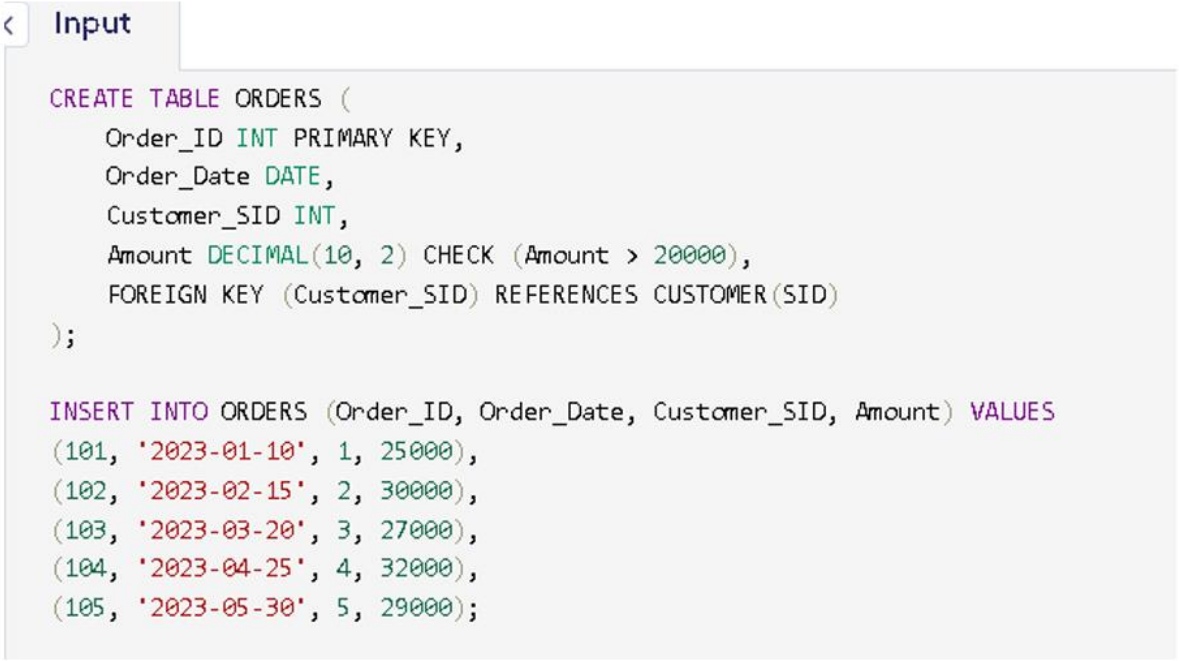
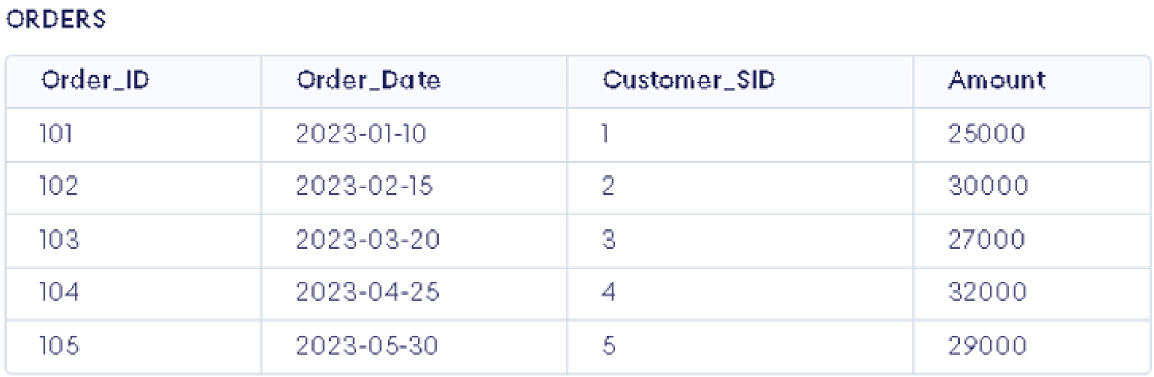


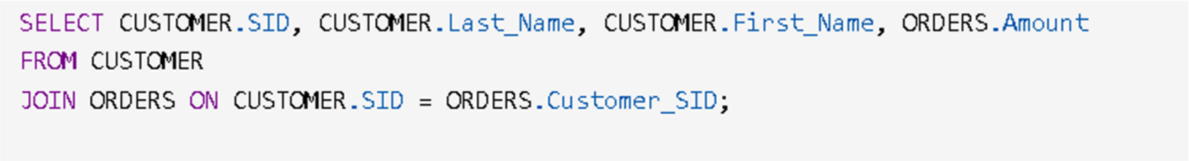
```
CREATE TABLE ORDERS (
    Order_ID INT PRIMARY KEY,
    Order_Date DATE,
    Customer_SID INT,
    Amount DECIMAL(10, 2) CHECK (Amount > 20000),
    FOREIGN KEY (Customer_SID) REFERENCES CUSTOMER(SID)
);

INSERT INTO ORDERS (Order_ID, Order_Date, Customer_SID, Amount) VALUES
(101, '2023-01-10', 1, 25000),
(102, '2023-02-15', 2, 30000),
(103, '2023-03-20', 3, 27000),
(104, '2023-04-25', 4, 32000),
(105, '2023-05-30', 5, 29000);
```



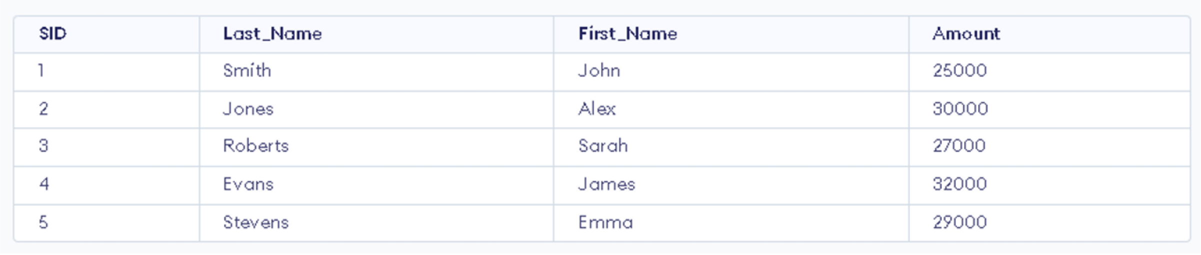
ORDERS

Order_ID	Order_Date	Customer_SID	Amount
101	2023-01-10	1	25000
102	2023-02-15	2	30000
103	2023-03-20	3	27000
104	2023-04-25	4	32000
105	2023-05-30	5	29000

2. List Customer Details Along with the Order Amount .



```
SELECT CUSTOMER.SID, CUSTOMER.Last_Name, CUSTOMER.First_Name, ORDERS.Amount
FROM CUSTOMER
JOIN ORDERS ON CUSTOMER.SID = ORDERS.Customer_SID;
```



SID	Last_Name	First_Name	Amount
1	Smith	John	25000
2	Jones	Alex	30000
3	Roberts	Sarah	27000
4	Evans	James	32000
5	Stevens	Emma	29000

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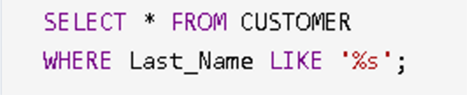
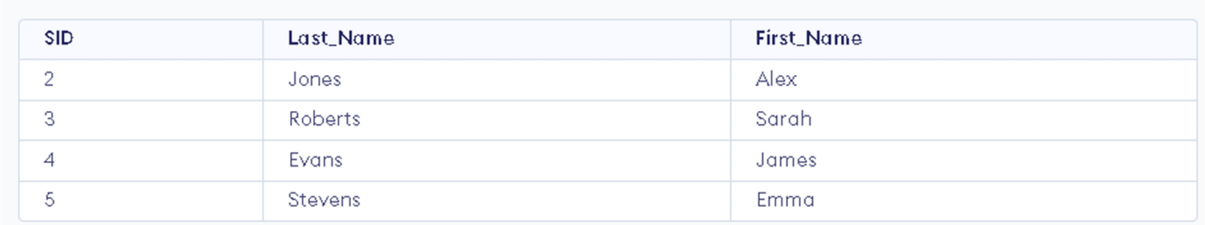
3.List Customers Whose Names End with "s" :

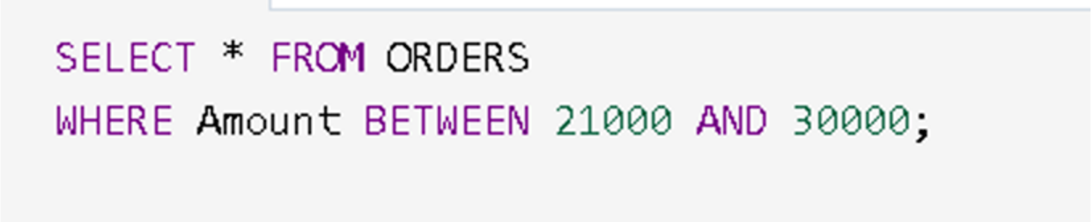


```
SELECT * FROM CUSTOMER
WHERE Last_Name LIKE '%s';
```

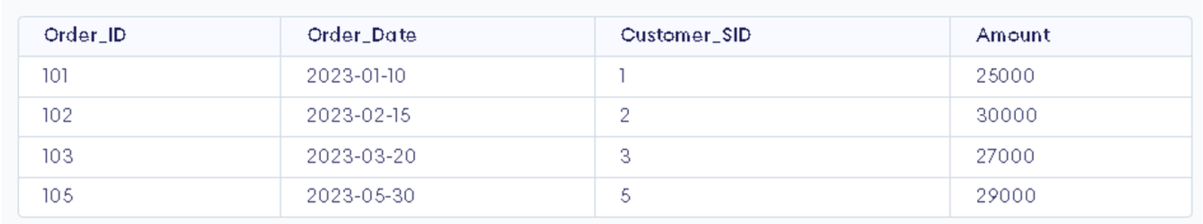


SID	Last_Name	First_Name
2	Jones	Alex
3	Roberts	Sarah
4	Evans	James
5	Stevens	Emma

4. List Orders Where Amount is Between 21000 and 30000 :

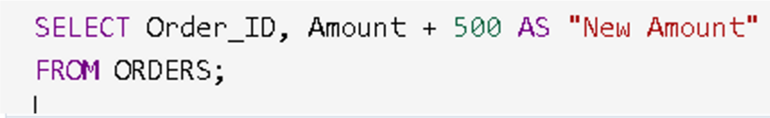


```
SELECT * FROM ORDERS
WHERE Amount BETWEEN 21000 AND 30000;
```

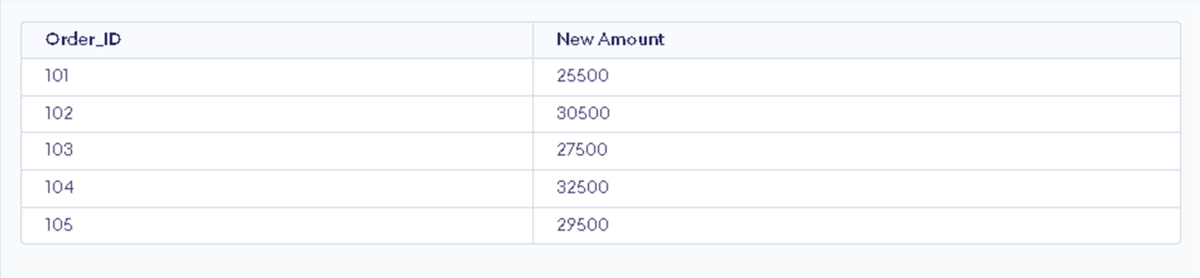


Order_ID	Order_Date	Customer_SID	Amount
101	2023-01-10	1	25000
102	2023-02-15	2	30000
103	2023-03-20	3	27000
105	2023-05-30	5	29000

5. List the orders where amount is increased by 500 and replace with name “new amount”.



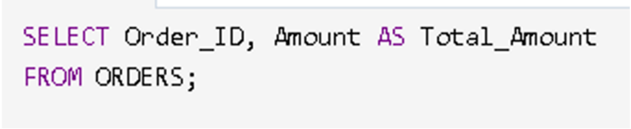
```
SELECT Order_ID, Amount + 500 AS "New Amount"
FROM ORDERS;
```



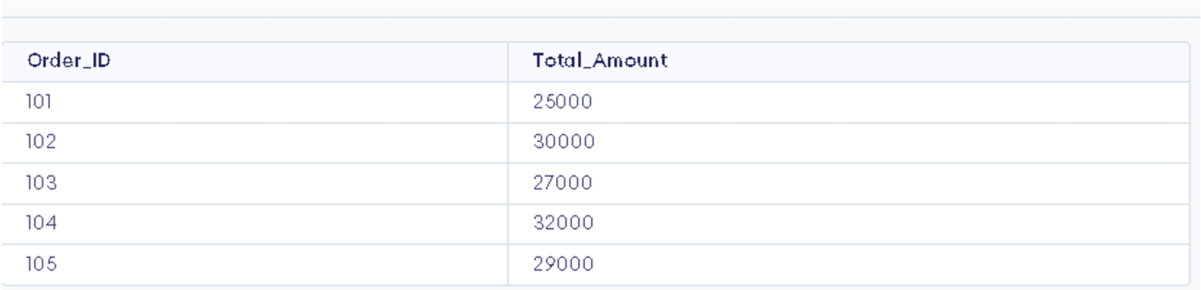
Order_ID	New Amount
101	25500
102	30500
103	27500
104	32500
105	29500

(POOJA)

6. Display the order_id and total amount of orders :

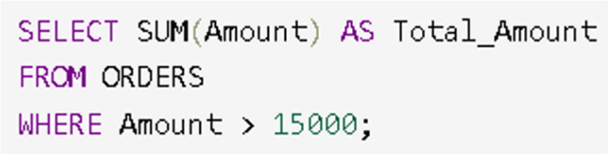


```
SELECT Order_ID, Amount AS Total_Amount
FROM ORDERS;
```

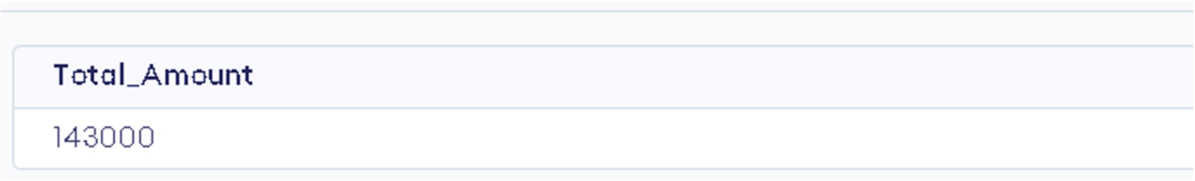


Order_ID	Total_Amount
101	25000
102	30000
103	27000
104	32000
105	29000

7. Calculate the total amount of orders that has more than 15000 .

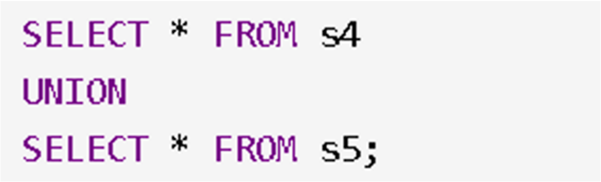


```
SELECT SUM(Amount) AS Total_Amount
FROM ORDERS
WHERE Amount > 15000;
```



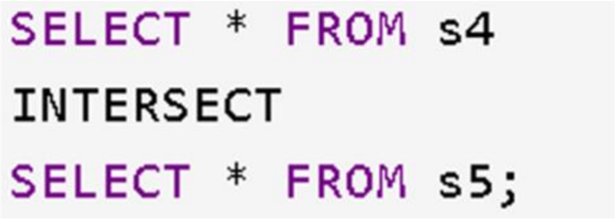
Total_Amount
143000

8. Display all the contents of s4 and s5 using union clause.



```
SELECT * FROM s4
UNION
SELECT * FROM s5;
```

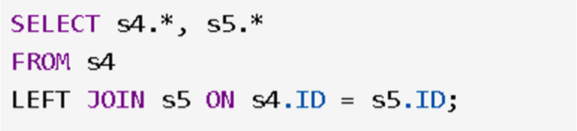
9. Find out the intersection of s4 and s5 tables.



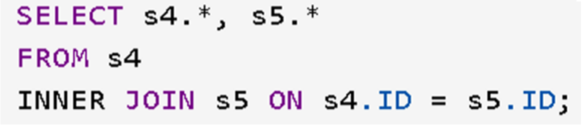
```
SELECT * FROM s4
INTERSECT
SELECT * FROM s5;
```

(POOJA)

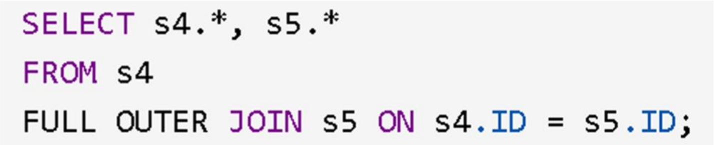
10. Display the names of s4 and s5 tables using left, right, inner and full join:



```
SELECT s4.*, s5.*
FROM s4
LEFT JOIN s5 ON s4.ID = s5.ID;
```

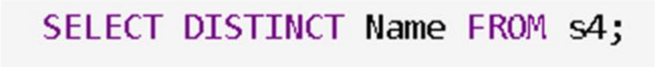


```
SELECT s4.*, s5.*
FROM s4
INNER JOIN s5 ON s4.ID = s5.ID;
```



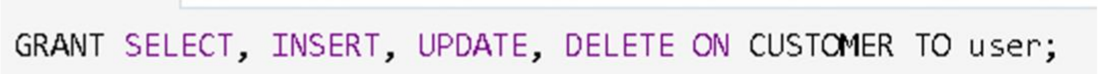
```
SELECT s4.*, s5.*
FROM s4
FULL OUTER JOIN s5 ON s4.ID = s5.ID;
```

11. Find out the names of s4 which are distinct :



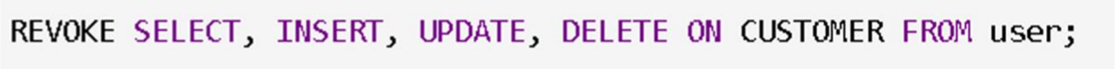
```
SELECT DISTINCT Name FROM s4;
```

12. Write a query to Grant access and modification rights to customer table to user :



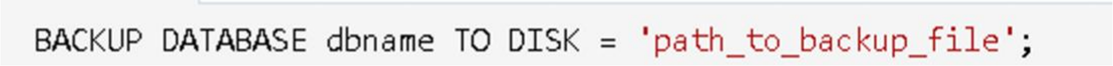
```
GRANT SELECT, INSERT, UPDATE, DELETE ON CUSTOMER TO user;
```

13. Write a query to revoke access rights to customer table to user :



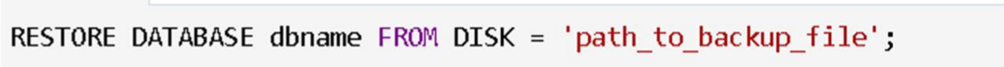
```
REVOKE SELECT, INSERT, UPDATE, DELETE ON CUSTOMER FROM user;
```

14. Write a query to take backup of a database:



```
BACKUP DATABASE dbname TO DISK = 'path_to_backup_file';
```

15. Write a query to restore a database :



```
RESTORE DATABASE dbname FROM DISK = 'path_to_backup_file';
```

(POOJA)