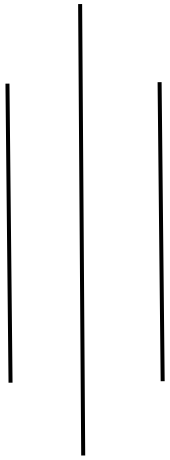
TRIBHUVAN UNIVERSITY

INSTITUTE OF SCIENCE AND TECHNOLOGY

MADAN BHANDARI MEMORIAL COLLEGE

New Baneshwor, Kathmandu



Lab Report of DBMS

Submitted by:

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Practical Record Index

Subject : DBMS

Name : Sudip Pradhan	**Semester :** Fourth	**Batch :** 2078	**Symbol No. :** 29170

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Lab No.: 1 **Date: 2080/10/12**

Title: Installation fo MS SQL SERVER

MS-SQL SERVER

Microsoft SQL Server (Structured Query Language) is a proprietary relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications

INSTALLATION STEPS :

Step 1 : Firstly, we download MS-SQL server file.

Step 2 : Then, we click on "SQLEXPRA_X64_ENU" application to extract "SQLEXPRADV_X64_ENU" file.

Step 3 : We click on the file and then, click 'setup'.

Step 4 : Click on 'Installation' and 'New SQL server stand-alone' installation or add features to an existing installation.

Step 5 : Then click on, 'I accept the license term' and 'Next'.

Step 6 : After clicking few 'Next' options, we have to choose 'Instance Features'. Choose according to the need and 'Next'.

Step 7 : We then choose 'Default Instance' and click 'Next'.

Step 8 : After specifying the 'authentication mode', click 'Next'. After clicking, it takes some time to install supporting files and then displays 'Install Successful'.

Now, We need to install SSMS for connecting SQL Server database.

Step 9 : Download SQL Server Management Studio (SSMS).

Step 10 : Then, click on SSMS-Setup-ENU, choose the location where to install and click 'INSTALL'.

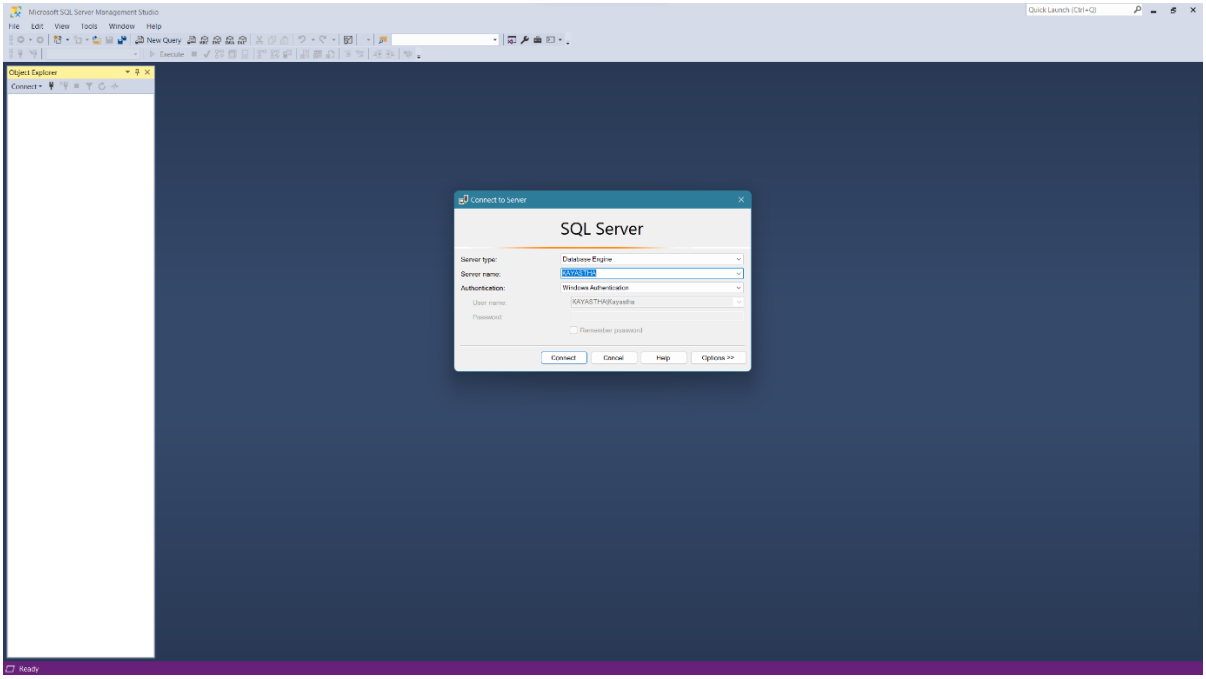
Step 11 : After some time, a window is displayed saying 'The computer needs to restart before setup can continue'. Click 'Restart'.

Step 12 : After Restart, the file is downloaded. Now click on 'Microsoft SQL Server Management Studio 18'.

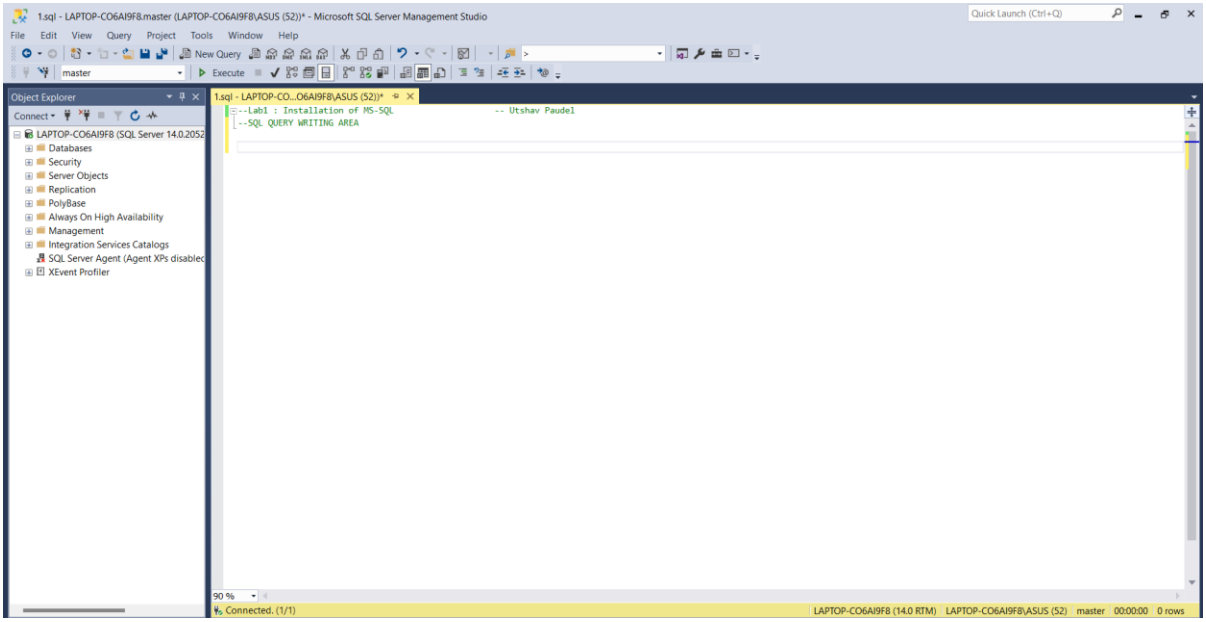
Step 13 : After doing installation, we now specify the server type, server name, Authentication and click 'Connect'.

We have successfully installed both the SQL server and SSMS.

CONNECTION OF SQL SERVER AND SSMS:



CODE WRITING AREA:



Lab No.: 2 **Date: 2080/10/12**

Title: Write a SQL code to create a simple table and display its attributes along with its values.

Theory:

MS SQL, which stands for Microsoft SQL Server, is a relational database management system (RDBMS) developed by Microsoft. It's a software program that allows you to store, organize, and access data efficiently.

SQL consists of clauses which are instructions within a query that help you specify what data you want to retrieve and how you want it manipulated. Few SQL clauses are:

- SELECT – This clause is the fundamental as it tells SQL what data you want to extract from the database. Asterisk (*) followed by SELECT will select the entire table.
- FROM – FROM clause specifies the table from which table you want to retrieve.
- WHERE – This clause filters the data based on a specific condition which is specifies by the comparison operators
- CREATE – This clause is used to create table and database
- DROP – This clauses is used to delete the table
- INSERT – This clause is used to insert values in a attributes of table

Source Code:

```
-- drop table with the similar name if it exists
drop table if exists practical_3

-- create table and give attribute names
create table practical_3
(roll_no int,
name varchar(100),
birth_date int,
);

-- check if table is creates with the following attributes using select clause
select * from practical_3
```

```
-- insert data into the table
insert into practical_3
values(1, 'Bibek', 2001),
        (2, 'Ramesh',2002),
        (3, 'Sanjok', 2004);
```

Output

	roll_no	name	birth_date
1	1	Bibek	2001
2	2	Ramesh	2002
3	3	Sanjok	2004

Lab No.: 3 **Date: 2080/10/12**

Title: Write a SQL code to create a simple table and display the unique values using primary key.

Theory:

DISTINCT - This clause is used to display the unique values in an attribute.

SOURCE CODE:

```
-- drop table if table with similar name exists
drop table if exists tbl_Employee
-- create a table with specific name
CREATE TABLE tbl_Employee
(
FirstName varchar(32),
MiddleName varchar(32),
LastName varchar(32),
Age int,
);
-- insert values into the specified table
insert into tbl_Employee(FirstName,MiddleName, LastName, Age)
values('Ram','Prashad', 'Neupane',42),
        ('Hari','Kumar','Paudel', 33),
        ('Hari', 'Kumar', 'Paudel', 33);

-- display everything inside tbl_Employee
select * from tbl_Employee

-- display only the unique rows
select DISTINCT * from tbl_Employee
```

Output:

```
select * from tbl_Employee
select DISTINCT * from tbl_Employee
```

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Results | Messages

	FirstName	MiddleName	LastName	Age
1	Ram	Prashad	Neupane	42
2	Hari	Kumar	Paudel	33
3	Hari	Kumar	Paudel	33

	FirstName	MiddleName	LastName	Age
1	Hari	Kumar	Paudel	33
2	Ram	Prashad	Neupane	42

Lab No.: 4 **Date: 2080/10/12**

Title: Write a SQL code and check the use of primary key

Theory:

Primary keys and foreign keys are both crucial concepts in relational database design, working together to ensure data integrity and establish relationships between tables. Here's a breakdown of their roles and how they link together.

Primary Key:

- A primary key is a column (or a set of columns) within a table that uniquely identifies each row. It acts as the enforcer of uniqueness, guaranteeing no two rows have the same value for the primary key.
- This ensures efficient data retrieval and manipulation, allowing you to pinpoint specific records without ambiguity.
- Primary keys typically don't allow null values, as a missing value would hinder unique identification.

SOURCE CODE:

```
-- drop table if table with similar name exists
drop table if exists tbl_Employee1

-- create a table
create table tbl_Employee1
(
id int primary key,
FirstName varchar(32) NOT NULL,
MiddleName varchar(32),
LastName varchar(32) not null,
Age int not null,
);

-- insert values into the table
insert into tbl_Employee1(id, FirstName, LastName, Age)
values
```

```
(22,'Krishna','Sitaula',44),
(23,'Hari', 'Gupta', 34),
(24, 'Bibek','Thapa', 54),
(25, 'Krishna','Bartaula',34);

-- display the table
select * from tbl_Employee1
```

OUTPUT:

1. When primary key is repeated then it shows "VOILATION OF PRIMARY KEY" which need to be changed.

```
Results  messages
Msg 2627, Level 14, State 1, Line 13
Violation of PRIMARY KEY constraint 'PK__tbl_Empl__3213E83FDF6F383F'. Cannot insert duplicate key in object
The statement has been terminated.

(0 rows affected)
```

2. When the unique id values are make by correcting the error then the output is:

	id	FirstName	MiddleName	LastName	Age
1	22	Krishna	NULL	Sitaula	44
2	23	Hari	NULL	Gupta	34
3	24	Bibek	NULL	Thapa	54
4	25	Krishna	NULL	Bartaula	34

Lab No.: 5 **Date: 2080/10/18**

Title: Write a SQL code to create a table and display the use of primary key and foreign key.

Theory:

Foreign Key:

- A foreign key resides in a different table than the primary key it references. It creates a link between two tables, establishing a relationship between their data.
- The foreign key column(s) in the child table must contain values that already exist in the primary key column(s) of the referenced parent table.
- This enforces referential integrity, preventing orphaned data (where a child record references a non-existent parent record).

Benefits of Using Primary and Foreign Keys:

- Data Integrity: They prevent inconsistencies and ensure data accuracy by maintaining referential relationships.
- Efficient Data Retrieval: By uniquely identifying rows and linking tables, they streamline queries that involve fetching data from multiple tables.
- Data Modeling: They are fundamental building blocks for creating well-structured and organized relational databases.

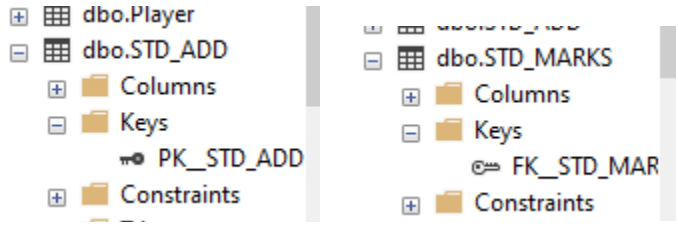
SOURCE CODE:

```
-- 2080/10/18
-- lab 6

-- drop table if exists
drop table if exists STD_ADD
Create table STD_ADD
(
Roll_No int primary key,
Names varchar(50),
Address varchar(50),
```

```
Place varchar(50),
Pin varchar(50)
);

-- create table
CREATE TABLE STD_MARKS
(
Roll_No int References STD_ADD ON DELETE CASCADE,
Subjects varchar(50),
Exam_date date,
Marks numeric(3)
);

-- select to see the STD_ADD table
select *
from STD_ADD
-- display STD_MARKS table
select *
from STD_MARKS
```

RESULT:

While using primary key and foreign key, we found that STD_ADD had a key as a primary key “PK_STD_ADD” where as STD_MARKS table had a key as “FK_ STD_MARKS”



Lab No.: 6 **Date: 2080/10/18**

Title: Write a SQL code to create a table and show the use of ALTER clause.

Theory:

The ALTER TABLE clause in SQL is used to modify the structure of an existing table. It's part of the Data Definition Language (DDL) category in SQL and allows you to make various changes to your tables. Here's a breakdown of the ALTER TABLE clause and its functionalities:

Basic Syntax:
ALTER TABLE [Table Name]
[ALTER COLUMN | ADD COLUMN | DROP COLUMN | RENAME TO | ...];

Explanation of Components:

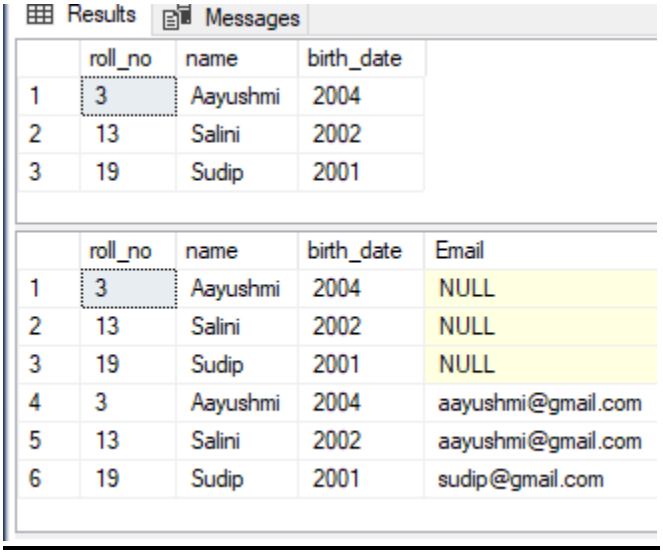
- ALTER TABLE [Table Name]: This specifies the name of the table you want to modify.
- The clause following ALTER TABLE: This defines the specific modification you want to make to the table. Here are some common options:
- ALTER COLUMN: Modify an existing column's data type, constraints, or nullability.
    - ADD COLUMN: Add a new column to the table, specifying its name, data type, and any constraints.
    - DROP COLUMN: Remove an existing column from the table.
    - RENAME TO: Rename the table itself or a specific column within the table.

SOURCE CODE:

```
-- drop table if table with similar name exists
drop table if exists Lab7

-- create a table as Lab7
create table Lab7
(roll_no int,
```

```
name varchar(50),
birth_date int
);

insert into Lab7 Values
(03, 'Aayushmi', 2004),
(13, 'Salini', 2002),
(19, 'Sudip', 2001);

-- check the table with display clause i.e select
select * from Lab7

-- use alter clause which add the new column as Email
ALTER Table Lab7
add Email varchar(50)

-- insert the values inside the table
insert into Lab7 Values
(03, 'Aayushmi', 2004,'aayushmi@gmail.com'),
(13, 'Salini', 2002, 'aayushmi@gmail.com'),
(19, 'Sudip', 2001, 'sudip@gmail.com');

-- display the table along with email attribute column
select * from Lab7
```

OUTPUT:



Results | Messages

	roll_no	name	birth_date
1	3	Aayushmi	2004
2	13	Salini	2002
3	19	Sudip	2001

	roll_no	name	birth_date	Email
1	3	Aayushmi	2004	NULL
2	13	Salini	2002	NULL
3	19	Sudip	2001	NULL
4	3	Aayushmi	2004	aayushmi@gmail.com
5	13	Salini	2002	aayushmi@gmail.com
6	19	Sudip	2001	sudip@gmail.com

Lab No.: 7 **Date: 2080/10/25**

Title: Write a SQL code to create a table and show the use of DELETE and UPDATE clauses.

Theory:

DELETE Clause: The DELETE clause permanently removes rows from a table.

- Syntax:
  DELETE FROM [Table Name]
  [WHERE Clause];

UPDATE Clause: The UPDATE clause modifies existing data within a table.

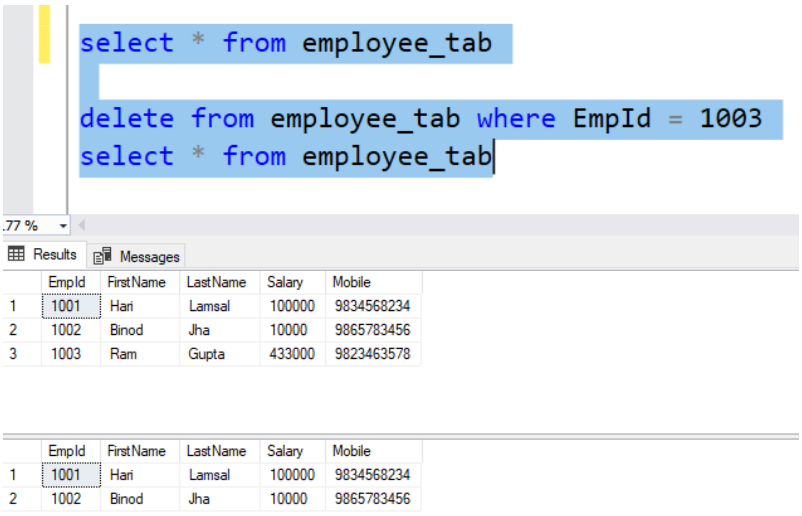
- Syntax:
  UPDATE [Table Name]
  SET [Column Name 1] = [New Value 1],
  [Column Name 2] = [New Value 2], ...
  [WHERE Clause];

SOURCE CODE:

```
-- Lab 9: 2080/10/25
-- drop database if exists Employee
 --create database Employee

use Employee
drop table if exists employee_tab
create table employee_tab
(
EmpId int primary key,
FirstName varchar(50),
LastName varchar(50),
Salary int,
Mobile varchar(50)
);

insert into employee_tab values
(1001, 'Hari', 'Lamsal', 100000, 9834568234),
(1002, 'Binod','Jha', 10000, 9865783456),
(1003, 'Ram','Gupta', 433000, 9823463578)
```

```
select * from employee_tab
delete from employee_tab where EmpId = 1003
select * from employee_tab

update employee_tab
set FirstName = 'Ram'
Where EmpId = 1002
select * from employee_tab
```

OUTPUT:



```
select * from employee_tab

delete from employee_tab where EmpId = 1003
select * from employee_tab
```

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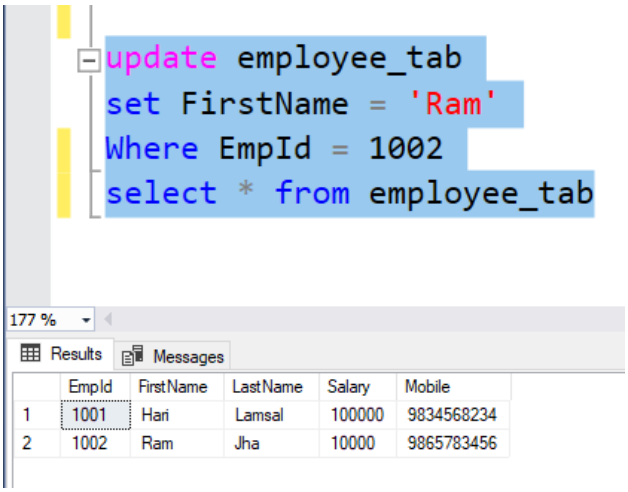
Results | Messages

	EmpId	FirstName	LastName	Salary	Mobile
1	1001	Hari	Lamsal	100000	9834568234
2	1002	Binod	Jha	10000	9865783456
3	1003	Ram	Gupta	433000	9823463578

	EmpId	FirstName	LastName	Salary	Mobile
1	1001	Hari	Lamsal	100000	9834568234
2	1002	Binod	Jha	10000	9865783456



```
update employee_tab
set FirstName = 'Ram'
Where EmpId = 1002
select * from employee_tab
```

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Results | Messages

	EmpId	FirstName	LastName	Salary	Mobile
1	1001	Hari	Lamsal	100000	9834568234
2	1002	Ram	Jha	10000	9865783456

Lab No.: 8 **Date: 2080/10/25**

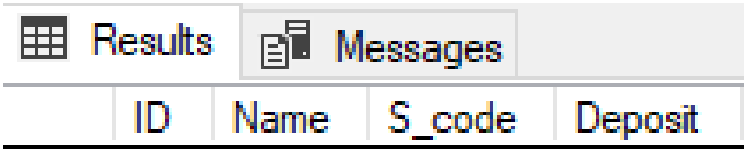
Title: ALTERING AND ADDING PRIMARY KEY IN TABLE

SOURCE CODE:

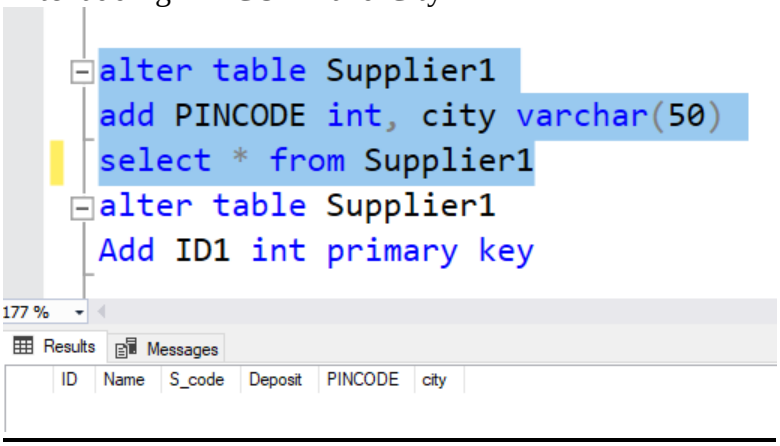
```
drop table if exists Supplier1
create table Supplier1
(
ID int,
Name varchar(50),
S_code int,
Deposit int
)
select * from Supplier1

alter table Supplier1
add PINCODE int, city varchar(50)
select * from Supplier1

alter table Supplier1
Add ID1 int primary key
select *from Supplier1
```

OUTPUT:

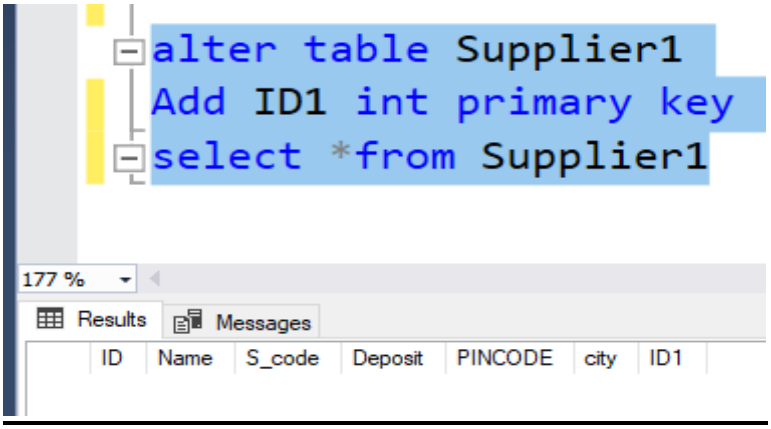
Before altering or adding city and PIN CODE



After adding PINCODE and City



After adding ID1 as primary key



Lab No.: 9 **Date: 2080/10/25**

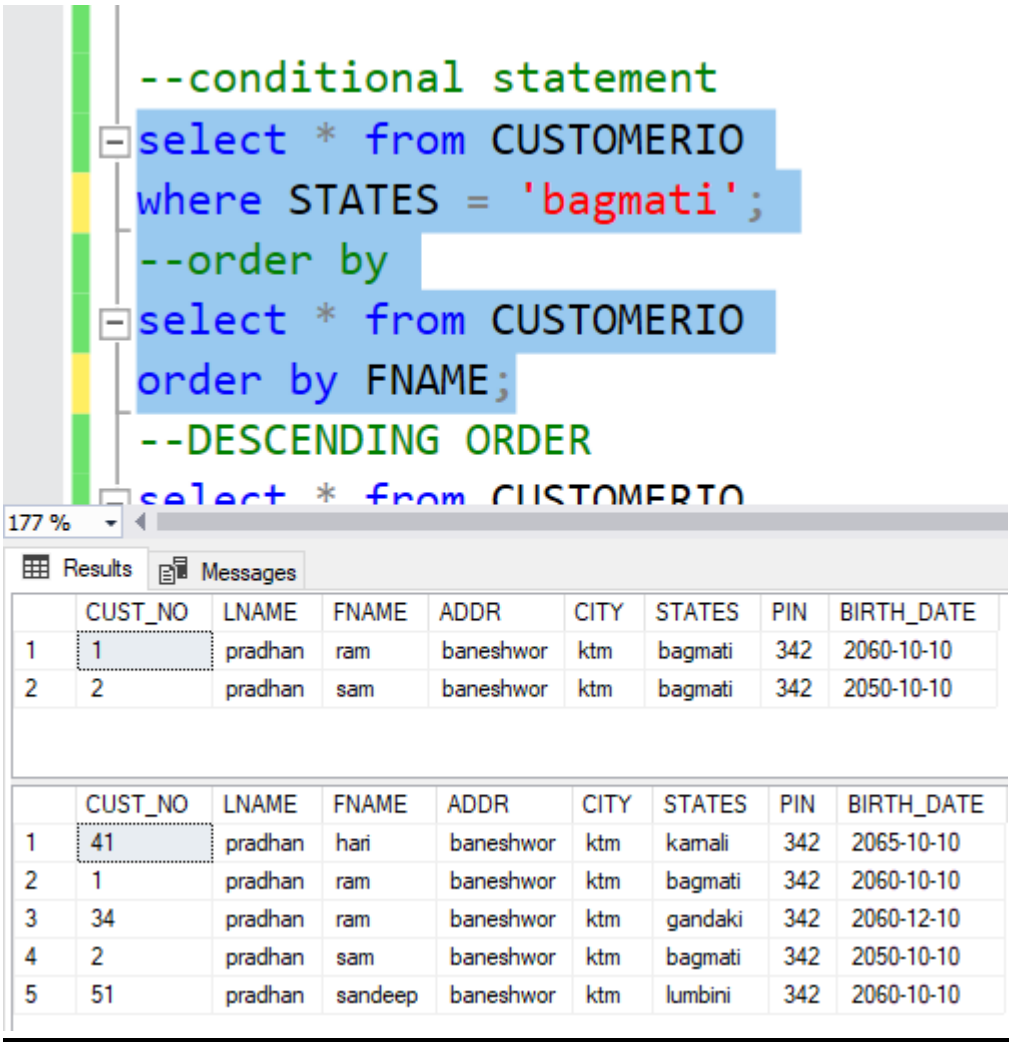
TITLE: IMPLEMENTATION OF GROUP BY AND ORDER BY

SOURCE CODE:

```
drop table if exists customerIO
create table CUSTOMERIO
(CUST_NO numeric(4) primary key,
LNAME  varchar(10),
FNAME varchar(15),
ADDR varchar(20),
CITY varchar(20),
STATES varchar(10),
PIN  varchar(3),
BIRTH_DATE date,
);

select * from CUSTOMERIO;

insert into CUSTOMERIO
values(0001,'pradhan','ram','baneshwor','ktm','bagmati','342','2060/10/10'),
(0002,'pradhan','sam','baneshwor','ktm','bagmati','342','2050/10/10'),
(34,'pradhan','ram','baneshwor','ktm','gandaki','342','2060/12/10'),
(0041,'pradhan','hari','baneshwor','ktm','karnali','342','2065/10/10'),
(00051,'pradhan','sandeep','baneshwor','ktm','lumbini','342','2060/10/10')

--conditional statement
select * from CUSTOMERIO
where STATES = 'bagmati';

--order by
select * from CUSTOMERIO
order by FNAME;

--DESCENDING ORDER
select * from CUSTOMERIO
order by FNAME desc;

-- ASCENDING ORDER
select * from CUSTOMERIO
order by FNAME asc;

--sort by lname
```

select * from CUSTOMERIO
order by FNAME, LNAME ;

OUTPUT:



	CUST_NO	LNAME	FNAME	ADDR	CITY	STATES	PIN	BIRTH_DATE
1	1	pradhan	ram	baneshwor	ktm	bagmati	342	2060-10-10
2	2	pradhan	sam	baneshwor	ktm	bagmati	342	2050-10-10

	CUST_NO	LNAME	FNAME	ADDR	CITY	STATES	PIN	BIRTH_DATE
1	41	pradhan	hari	baneshwor	ktm	kamali	342	2065-10-10
2	1	pradhan	ram	baneshwor	ktm	bagmati	342	2060-10-10
3	34	pradhan	ram	baneshwor	ktm	gandaki	342	2060-12-10
4	2	pradhan	sam	baneshwor	ktm	bagmati	342	2050-10-10
5	51	pradhan	sandeep	baneshwor	ktm	lumbini	342	2060-10-10

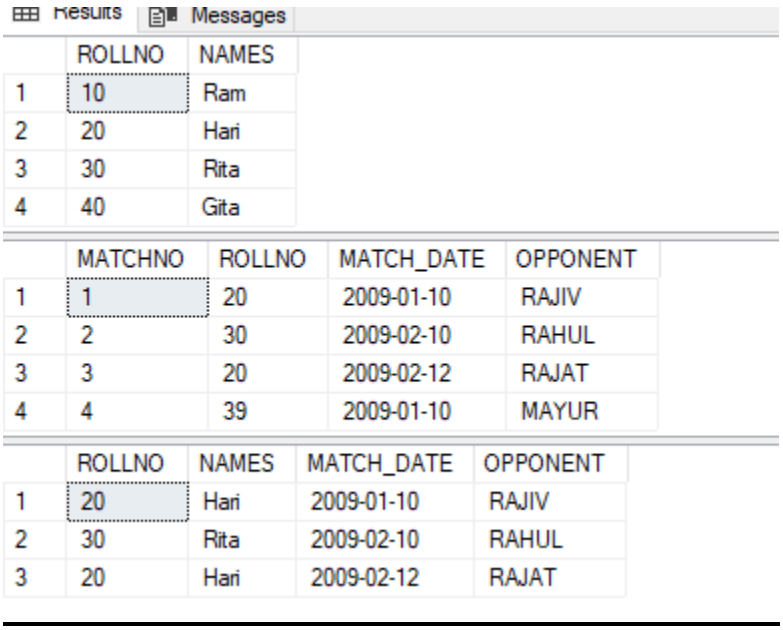
Lab No.: 10 **Date: 2080/10/25**

Title: Simple Join

SOURCE CODE:

```
drop table if exists player
create table player
(
   ROLLNO numeric(5),
   NAMES varchar(10)
);
--inserting values

insert into player(ROLLNO, NAMES)
values(10,'Ram'),
(20,'Hari'),
(30,'Rita'),
(40,'Gita');

select * from player;
drop table if exists matches
create table matches
(
   MATCHNO numeric(5),
   ROLLNO  numeric(5),
   MATCH_DATE DATE,
   OPPONENT varchar(10)
);

insert into matches(MATCHNO,ROLLNO,MATCH_DATE,OPPONENT)
values(1,20,'10-JAN-2009','RAJIV'),
(2,30,'10-FEB-2009','RAHUL'),
(3,20,'12-FEB-2009','RAJAT'),
(4,39,'10-JAN-2009', 'MAYUR');
select* from matches

--INNER JOIN
SELECT player.ROLLNO, NAMES, MATCH_DATE, OPPONENT
FROM player , matches
where player.ROLLNO = matches.ROLLNO;
```

OUTPUT:



Results Messages

	ROLLNO	NAMES
1	10	Ram
2	20	Hari
3	30	Rita
4	40	Gita

	MATCHNO	ROLLNO	MATCH_DATE	OPPONENT
1	1	20	2009-01-10	RAJIV
2	2	30	2009-02-10	RAHUL
3	3	20	2009-02-12	RAJAT
4	4	39	2009-01-10	MAYUR

	ROLLNO	NAMES	MATCH_DATE	OPPONENT
1	20	Hari	2009-01-10	RAJIV
2	30	Rita	2009-02-10	RAHUL
3	20	Hari	2009-02-12	RAJAT

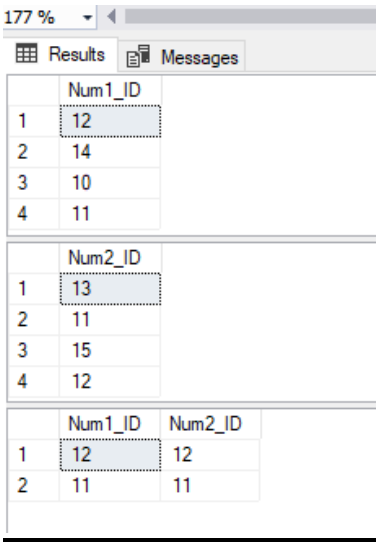
Lab No.: 11 **Date: 2080/10/25**

Title: Inner Join

SOURCE CODE:

```
drop table if exists tab1
create table tab1
(
Num1_ID int,
);
-- inserting value into first table
insert into tab1(Num1_ID)
values(12), (14), (10), (11)

--creating second table
drop table if exists tab2
create table tab2
(
Num2_ID int,
);
--inserting values into second table
insert into tab2(Num2_ID)
values (13), (11), (15), (12)

select * from tab1
select * from tab2
select * from tab1 Inner Join tab2 ON tab1.Num1_ID = tab2.Num2_ID
```

OUTPUT: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Results Messages

	Num1_ID
1	12
2	14
3	10
4	11

	Num2_ID
1	13
2	11
3	15
4	12

	Num1_ID	Num2_ID
1	12	12
2	11	11

Lab No.: 12 **Date: 2080/10/25**

TITLE: IMPLEMENTATION OF PRIMARY KEY AND FOREIGN KEY CONSTRAINS

SOURCE CODE:

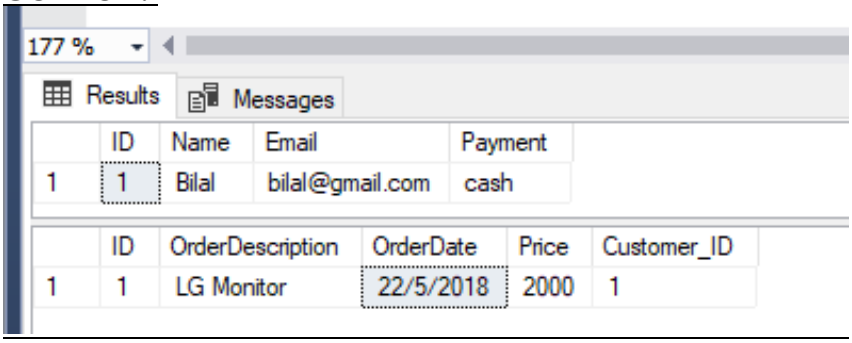
```
create table customers(
ID int not null,
Name varchar(40),
Email varchar(40),
Payment varchar(40),
primary key(ID),                    --- primary key
);

create table orders(
ID int not null,
OrderDescription varchar(40),
OrderDate varchar(40),
Price int,
primary key(ID),
Customer_ID int references customers(ID),          --- foreign key
);

insert into customers values(1,'Bilal','bilal@gmail.com','cash');
insert into orders values(1,'LG Monitor','22/5/2018',2000,1);

select * from customers
select * from orders
```

OUTPUT:


177 %
Results
Messages
ID
Name
Email
Payment
1
1
Bilal
bilal@gmail.com
cash
ID
OrderDescription
OrderDate
Price
Customer_ID
1
1
LG Monitor
22/5/2018
2000
1