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Experiment-2: Basic DDL and DML commands of SQL based on University Management System.

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Branch:CSE-IoT

Section/Group:1-A

Semester: 3 rd

Date of Performance:

Subject Name:DBMS LAB

Subject Code:CSP 221

1. Aim/Overview of the practical:

Basic DDL and DML commands of SQL based on University Management System.

2. Task to be done:

Explain in Detail about DDL and DML commands of SQL based on University Management System. Differentiate between them.

3. Theme/Interests definition(For creative domains):

DDL:

DDL stands for Data Definition Language. DDL has no further classification. DDL statements are used to create database, schema, constraints, users, tables etc. CREATE, DROP, RENAME and ALTER.

DML: DML stands for Data Manipulation Language. DML statement is used to insert, update or delete the records. DML is further classified into procedural DML and non-procedural DML. INSERT, UPDATE and DELETE.

4. Observations/Discussions(For applied/experimental sciences/materials based labs):

COMMANDS OF SQL ARE: -

1. Creating A Table: -



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- **Purpose** - The Create Table command is used to create a table in the database. It consists of rows and columns.
- **Syntax**- CREATE TABLE <TableName> (<ColumnName1> <Data Type>(<Size>),<ColumnName2> <Data Type>(<Size>);

The screenshot shows the pgAdmin 4 interface. On the left, the 'Servers' tree view shows a connection to 'PostgreSQL 13' with several databases listed: '1', 'airline management system', 'details', 'postgres', 'superMart_DB', 'test', 'training', 'Login/Group Roles', and 'Tablespaces'. The 'details' database is selected. In the main central area, the 'Query Editor' tab is active, displaying the SQL command: 'create table details(id varchar(20),name varchar(20),city varchar(20),gmail varchar(20));'. Below the query editor, the 'Messages' tab shows the message: 'Query returned successfully in 118 msec.' At the bottom of the screen, the Windows taskbar is visible with various pinned icons.

2. Inserting Data Into The Table: -

- **Syntax** – INSERT INTO <TABLE NAME> VALUES(EXP1,EXP2,..,EXP..);
- **Purpose** – To insert data into the table in rows and columns.



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The screenshot shows the pgAdmin 4 interface. On the left, the object browser displays a tree structure of servers, databases, and tables. In the center, the Query Editor window contains the following SQL code:

```
1 create table infostudent(id varchar(20),name varchar(20),city varchar(20),gmail varchar(20));
2 insert into infostudent values('19bcs4520','parikshit','mandi','parikshit@gmail.com');
```

Below the Query Editor, the Messages tab shows the output: "INSERT 0 1" and "Query returned successfully in 51 msec." At the bottom of the screen, the Windows taskbar is visible with various pinned icons and the system tray showing the date and time.

3. Viewing Data In The Tables: -

- **Syntax –** SELECT * FROM <TABLE NAME>;
- **Purpose:-** This command is used to view all the rows and columns of the table created in the database.



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The screenshot shows the pgAdmin 4 interface. At the top, there's a toolbar with various icons for database management. Below it is a navigation bar with links like Dashboard, Properties, SQL, Statistics, Dependencies, Dependents, and a connection status for 'details/postgres@PostgreSQL 13'. The main area is divided into sections: 'Query Editor' (which contains the query code) and 'Query History'. The 'Query Editor' section shows the following SQL code:

```
1  SELECT * FROM public.infostudent
2
```

Below the editor is a 'Notifications' section with a table for recorded events. The table has columns for 'Recorded time', 'Event', and 'Process ID', with a single row indicating 'No data found'.

At the bottom, there's a 'Data Output' section which displays the results of the executed query. The table has columns for 'id', 'name', 'city', and 'gmail'. One row of data is shown:

	id character varying (20)	name character varying (20)	city character varying (20)	gmail character varying (20)
1	19bcs4520	parikshit	mandi	parikshit@gamil.com

4. Filtering Table Data: -

- **Syntax** - Select * from <table name> where <condition>;
- **Purpose:-** If the information of a particular student is to be retrieved from a table, its retrieval must be based on a specific condition



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pgAdmin 4

127.0.0.1:49201/browser/

pgAdmin File Object Tools Help

Browser

PostgreSQL 13

Databases (7)

1

airline management system

details

Casts

Catalogs

Event Triggers

Extensions

Foreign Data Wrappers

Languages

Schemas (1)

public

Collations

Domains

FTS Configurations

FTS Dictionaries

FTS Parsers

FTS Templates

Foreign Tables

Functions

Materialized Views

Procedures

Sequences

Tables (2)

details

infostudent

Columns

Constraints

Indexes

RLS Policies

Notifications

Recorded time Event Process ID Payload

No data found

Data Output Explain Messages

	id	name	city	gmail
1	19bcs4520	parikshit	mandi	parikshit@gmail.com
2	19bcs4520	parikshit	mandi	parikshit@gmail.com

Type here to search

ENG IN 11:06 AM

5. Eliminating Duplicate Rows When Using A Select Statement

- Purpose:-** A table could hold duplicate rows from display. This could be removed by using DISTINCT clause.
- Syntax:-** Select Distinct <col name1>, <col name2> from <table name>;



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The screenshot shows the pgAdmin 4 interface connected to a PostgreSQL 13 database. The left sidebar displays the schema tree under 'PostgreSQL 13'. The 'details' and 'infostudent' tables are selected. The main pane contains a Query Editor with the following SQL code:

```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
```

The result grid shows the following data:

city
shimla
manali
mandi
kullu
solan

6. Delete Operation: -

- Purpose:-** To delete the rows from the table that satisfies the condition provided by its where clause and returns the number of records deleted.
- Syntax:-** Delete from <table name> where <condition>;



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```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
```

7. Sorting Data In A Table

- Purpose:-** Oracle allows data from a table to be viewed in a sorted order. The rows retrieved from the table will be sorted in either **ascending** or **descending** order.
- Syntax:-** Select * from <table name> order by <col name1>, <col name2> <[Sort order]>;



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The screenshot shows the pgAdmin 4 interface. On the left, the 'Browser' pane displays a tree structure of the PostgreSQL 13 database. Under 'details', there are several objects like Casts, Catalogs, Event Triggers, Extensions, Foreign Data Wrappers, Languages, Schemas, and Tables. The 'Tables' node is expanded, showing 'details' and 'infostudent'. The 'infostudent' table is selected. In the center, the 'Query Editor' pane contains the following SQL code:

```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kulu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
```

Below the query editor, the 'Notifications' and 'Recorded time' panes are visible. The 'Notifications' pane shows a table with columns: Recorded time, Event, Process ID, and Payload. The 'Recorded time' pane shows a table with columns: Data Output, Explain, and Messages. The 'Data Output' table has columns: id, name, city, and gmail. The data is as follows:

id	name	city	gmail
1	vishal	shimla	vishal@gmail.com
2	vishal	shimla	vishal@gmail.com
3	vishal	shimla	vishal@gmail.com
4	vishal	shimla	vishal@gmail.com
5	parikshit	mandi	parikshit@gmail.com
6	parikshit	mandi	parikshit@gmail.com
7	kanu	solan	kanu@gmail.com

8. Creating A Table From A Table

Command:- Create tableas Select

Purpose:- To create a copy of existing table with create table and select statements.

Syntax:- Create Table <TableName> (<ColumnName1>, <ColumnName2>,...) as select <colname1>, <colname2>,... From <existing table name>;



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```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
9 create table emp as select id,name from infostudent;
```

9. Inserting Data Into A Table From Another Table

Command:- Insert into....Select

Purpose:- To filter the data that is not required

Syntax:- Insert into <table name>Select <col name1>, <col name2>.... from <table name>;



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```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
9 create table emp_info as select id,name from infostudent;
10 insert into emp_info select id,name from infostudent where name='parikshit';
```

10. Updating The Contents Of A Table

Command:- Update.....set

Purpose:- The Update statement updates columns in the existing table's rows with new values. The Set clause indicates which column data should be modified and the new valued they should hold.

Syntax:-

- ✓ Updating Specific Records

Update <table name> set <col name1>=<expression1>, <col name2>=<expression2> where <condition>;



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✓ Updating All The Records

Update <table name> set <col name1>=<expression1>, <col name2>=<expression2>;

The screenshot shows the pgAdmin 4 interface. On the left, the Object Browser tree shows a database named 'airline management system' containing a 'details' schema with various objects like Casts, Catalogs, Event Triggers, etc. Under 'Tables (2)', there is a 'infostudent' table. The central area is the Query Editor window titled 'details/postgres@PostgreSQL 13'. It contains the following SQL code:

```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
9 update infostudent set city='town';
10 select *from infostudent;
```

Below the Query Editor is a Notifications panel showing a successful query run message: "Successfully run. Total query runtime: 90 msec. 23 rows affected." At the bottom, the Windows taskbar shows various open applications including Microsoft Word, Excel, and Adobe Photoshop.



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```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
9 update infostudent set city='town';
10 select *from infostudent;
11 update infostudent set name='siya' where id='19bcs4522';
```

11.

Modifying The Structure Of A Table

Command:- Alter Table

Purpose:- The structure of a table can be modified by using a alter table command. Alter Table allows changing the structure of an existing table. With Alter Table it is possible to add or delete columns, create or destroy indexes, change the data type of existing columns, or rename columns or the table itself

Syntax:-

Adding New Columns

Alter table <table name> add(<new col name> <data type> (<Size>), <new col name> <data type> (<Size>),....);

Modifying Existing Column



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Alter table <table name> modify(<col name> <new data type> (< new Size>), <col name> <new data type> (<new Size>),.....);

Dropping A Column

Alter table <table name> drop column <col name>;

The screenshot shows the pgAdmin 4 interface. The left sidebar displays a tree view of the database schema, including the 'airline management system' database, its schemas (public, details), tables (infostudent, infostudent), and various objects like casts, catalogs, triggers, and functions. The main window is the 'Query Editor' tab, which contains the following SQL code:

```
1 select *from infostudent where city='mandi';
2 insert into infostudent values ('19bcs4521','vishal','shimla','vishal@gmail.com');
3 insert into infostudent values('19bcs4522','bhaskar','kullu','bhskar@gmail.com');
4 insert into infostudent values('19bcs4523','avisha','manali','avi@gmail.com');
5 insert into infostudent values('19bcs4524','kanu','solan','kanu@gmail.com');
6 select distinct city from infostudent;
7 delete from infostudent where id='19bcs4523';
8 select *from infostudent order by name desc;
9 update infostudent set city='town';
10 select *from infostudent;
11 update infostudent set name='siya' where id='19bcs4522';
12 ALTER TABLE infostudent add course varchar(255);
13
```

Below the Query Editor, the 'Notifications' section shows a single message: 'Query returned successfully in 286 msec.' The bottom status bar indicates the session is connected to '127.0.0.1:49201/browser' and the current date and time as '9/11/2020 2:53 PM'.



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The logo consists of the letters "NAAC" in a large, bold, grey sans-serif font. To the right of "NAAC" is a large red "A+" grade symbol. Below "NAAC" and "A+" is the word "GRADE" in a smaller, bold, black sans-serif font. At the bottom of the logo is the text "ACCREDITED UNIVERSITY" in a smaller, black sans-serif font.

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The screenshot shows the pgAdmin 4 interface connected to a PostgreSQL 13 database. The left sidebar displays the schema structure under the 'details' schema, including tables like 'airline management system', 'Cast', 'Catalogs', 'Event Triggers', 'Extensions', 'Foreign Data Wrappers', 'Languages', and 'Schemas (1)' which contains 'public'. Under 'public', there are 'Collations', 'Domains', 'FTS Configurations', 'FTS Dictionaries', 'FTS Parsers', 'FTS Templates', 'Foreign Tables', 'Functions', 'Materialized Views', 'Procedures', 'Sequences', and 'Tables (2)'. The 'Tables (2)' section is expanded, showing 'details' and 'infostudent'. The 'infostudent' table is selected, and its details are shown in the main pane. A query in the Query Editor window reads: 'alter table infostudent drop column cv;'. Below the query editor, the Notifications panel shows a message: 'Query returned successfully in 113 msec.' The taskbar at the bottom indicates the user is in ENG IN mode at 3:02 PM on 9/11/2020.

12. Renaming Tables

Command:- Rename

Purpose:- To change the name of a table as per the user's wish or requirement.

Syntax:- Rename <new table name> to <old table name>;



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The screenshot shows the pgAdmin 4 interface. On the left, the Object Browser displays a tree view of the database schema, including the public schema which contains tables like infostudent and studentdata. In the center, the Query Editor window shows the following SQL code:

```
1 ALTER TABLE infostudent
2 RENAME TO studentdata;
```

Below the Query Editor, the Notifications panel shows a message: "Query returned successfully in 88 msec." The status bar at the bottom right indicates the system is in English (ENG) and the date and time are 9/11/2020 3:07 PM.

13 .Truncating Tables

Command:- Truncate Table

Purpose:- Truncate Tables empties the table completely. Once the data deleted cannot be retrieved.

Syntax:- Truncate Table <table name>;



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The screenshot shows the pgAdmin 4 interface. On the left, the Object Browser tree view displays various database objects like 'airline management system', 'details', 'public', 'Tables (2)', and 'superMart_DB'. In the center, the Query Editor window contains the command: `1 truncate table studentdata;`. Below the Query Editor, the Notifications panel shows a message: `TRUNCATE TABLE` and `Query returned successfully in 727 msec.`. The bottom status bar shows the date and time: `9/11/2020 3:11 PM`.

14.Destroying Table: -

- Purpose:-** Sometimes table in the database becomes obsolete and need to be discarded, so we use drop table command.
- Syntax:-** Drop table <table name>;



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The screenshot shows the pgAdmin 4 interface. On the left is a tree view of the database schema, including 'airline management system' and 'public' schema details like Collations, Domains, FTS Configurations, etc. The central area is the Query Editor with the following SQL code:

```
1 truncate table studentdata;
2 drop table studentdata;
```

Below the Query Editor is a Notifications panel showing a successful 'DROP TABLE' operation:

Recorded time	Event	Process ID	Payload
	DROP TABLE		Query returned successfully in 179 msec.

A green message box at the bottom right also indicates success: "✓ Query returned successfully in 179 msec."

5. Result/Output/Writing Summary: NIL

6. Graphs (If Any): Image/Soft copy of graph paper to be attached here: NIL

Learning outcomes (What I have learnt):

1. Learned how to create table.
2. Learned how to insert data in table.



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3. Learned how to delete row/column.
4. Learned how to modify/alter/add the data.
5. Learned how to rename the table.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			