Advanced Database Management System LAB
(Assignment-1)

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Ques1). Different platform to run SQL

SQL editors are another name for SQL IDEs. SQL editors or SQL IDEs can be used by database administrators and web developers to perform and execute a variety of SQL queries as well as integrate the database with the application. These editors also assist in the creation of a database connection, allowing you to see, control, and modify database data.
There are numerous SQL Platform available, Some of most popular ones are as follows:

1) **DBeaver -**

It's a multi-platform database management solution that's open to all kinds of developers, SQL programmers, analysts, and database administrators (DBAs). DBeaver is a Java-based database management system that can handle almost any database type.

Following are the features of DBeaver :

- It's a completely free and open-source programme.
- You can examine and edit database metadata, tables, keys, indexes, and columns with this SQL application.
- The SQL editor supports auto-formatting, auto-completion, and hyperlinks.
- It offers a variety of data views to meet the needs of a wide range of users, including the ability to display image contents (gif, png, jpeg, bmp) as images.
- Custom filters, including filters based on cell values, can be used to filter table contents and query results.

2) Microsoft SQL Server Management Studio Express -

The majority of database developers have long preferred Microsoft SQL server management studio. While it has lost its top spot to IDEs like Adminer and DBeaver, it is still one of the best in the market, owing to its history as well as what it has to offer, especially given that it is free.

Following are the features of Microsoft SQL Server Management Studio Express :

- It provides a single, integrated environment for managing and authoring SQL Server Database Engine.
- It allows users to send them to a Code Editor or to script them for later execution.
- Due to non-modal and resizable dialogues, users can use a variety of tools while the dialogue is open.
- Users can complete management dialogue actions at a later time by using a common scheduling dialogue.
- Importing and exporting goods SQL Server Management Studio is a tool for managing SQL Server databases.
- SQL Server generates XML Deadlock and Showplan files that you can save or print automatically.
- A tutorial for SQL Server Management Studio that will help users take advantage of the many new features and become more productive right away.
- A built-in Web browser that can be used to access online or MSDN help.
- To provide more information, a error and informational message box has been provided.

3) SQuirrel -

The SQuirreL SQL IDE, which has a very simple and user-friendly graphical interface, can access all types of relational databases. It can connect to various databases remotely because it is written in Java. SQuirrel SQL is a comprehensive database migration solution, which is frequently hampered by syntax differences.

Following are the features of SQuirrel :

- This is a graphs plugin. A human query builder and an automated SQL query generator are both included. Table chart relationships are straightforward to construct.

- Tab with results that can be changed. It gives you a complete picture of the information you need from your database.

- An ingenious editor. Syntax highlighting and code completion are available, but what makes this unique is that it keeps functionality to a bare minimum while maintaining flexibility. The editing interface is simple and sleek to aid efficiency.

4) MySQL Workbench -

Another useful IDE to use is MySQL Workbench. MySQL can be used to visually model, design, generate, and administer databases by a database administrator, data architect, or developer. MySQL Workbench comes with almost everything a database administrator needs for forward and reverse engineering, as well as the ability to generate some of the most complex ER models. MySQL Workbench also includes essential components for completing time-consuming and exhausting documentation and change management tasks.

Following are the features of MySQL Workbench :

- Visual SQL Editor – This tool is great for creating, editing, and running SQL queries. You can see how your changes will look before you make them, which is extremely useful. A powerful debugger, colour syntax highlighting, context-sensitive assistance, and autocomplete are also included.

- Tool for database migration – It includes a straightforward solution for migrating tables, objects, and data from Microsoft SQL Server, Microsoft Access, Sybase ASE, PostgreSQL, and other RDBMS to MySQL.

- Provides a visual performance dashboard – With the Visual Explain Plan, you can see where to optimize your query with a single click.

5) Oracle Live SQL -

Oracle Live SQL is a new feature in Oracle Database 12c that allows developers to create and run SQL scripts against Oracle databases quickly and easily. It's good for quick code demonstrations, debugging, and troubleshooting. In general, Oracle is a more convenient way for those teaching or demonstrating SQL, PL/SQL, or another function. Oracle Live SQL has the advantage of working with any database on the platform (not just Oracle).
It's a web-based tool. It allows you to run queries and demonstrations in an Oracle environment without requiring a full installation. It is accessible from anywhere, requires no additional configuration or permissions, and saves time by eliminating all "setup" work from teaching sessions.

Some key features of Live SQL are as follows:

- It helps you gain visibility into all your different data sources, and then it allows you to query those databases using powerful SQL-based queries.
- This Oracle tool can be used in many ways, but one of the most common purposes is finding errors in your database or trying to find information missing from a particular set of data.
- You can see the results of your queries right away.
- It is an all-inclusive package is available for Windows or Linux users and easy to install.
- The software is free for personal use (but pay attention to the restrictions).
- It allows developers and business analysts to process live, transactional data in real time.
- It also provides rich analytic capabilities, such as analytics for forecasting and predictive modeling, by integrating the following packages: OLAP Services, Data Mining Extension, Data Visual Extensions, and so on.

Ques2). Role of Subqueries in data Mining

"Data mining" is the only method for quickly sorting large data sets. It also uses data analysis skills to identify each record and its relationship in order to solve the problem. Machine Learning, Statistics, and Database Systems are just a few of the wonderful data analysis methods covered by data mining. Data mining's main goal is to extract information from large data sets and convert it into a useful data structure.

Sub Queries in Data Mining :

In SQL, a subquery is a query that is nested inside another query, also known as a Nested query or Inner query. This returns data for the condition inside parentheses that is used in the main query. As a result, a subquery is nested within the WHERE, FROM, and SELECT clauses.
The following is the exact syntax of a subquery.

```
SELECT    select_list
FROM      table
WHERE     expr operator
                (SELECT    select_list
                FROM       table);
```

- ✧ A subquery is always used in conjunction with the WHERE Clause of another SQL SELECT command.
- ✧ It is always surrounded by parentheses.
- ✧ You can also use these operators, which are similar to >,, and =.
- ✧ The nested query executes first, followed by the parent query. As a result, the output of a nested query is passed on to the outer query.
- ✧ The ORDER BY command cannot be used within a nested query, but it can be used in the main query.
- ✧ Until the multiple columns compare to the selected columns, an inner query always has one selected column in the SELECT clause.
- ✧ The BETWEEN clause cannot be used in the subquery, However, you can use BETWEEN clause in the main query.

You can use all common commands like SELECT, INSERT, UPDATE and DELETE in the subquery for getting the result better through the help of data mining process.

Subqueries with the SELECT Command :

There is a common syntax for writing a subquery as given below;

```
SELECT column_name [, column_name ]

FROM table1 [, table2 ]

WHERE column_name OPERATOR

(SELECT column_name [, column_name ]

FROM table1 [, table2 ]

[WHERE]

)
```

Example -

Let’s say we have a table as shown below;

ID	Name	Location	Age	Salary
1	Sanskriti	Jaipur	22	3000
2	Abhishek	Indore	24	1500
3	Anjali	Banglore	28	10000
4	Nickky	Delhi	25	6000
5	George	Mumbai	32	2000
6	Virat	Delhi	30	5500

Select command for the following output,

```
SELECT * FROM CUSTOMER
WHERE ID IN
(
SELECT ID FROM CUSTOMER
WHERE SALARY > 4000
)
```

the output will look like this;

ID	Name	Location	Age	Salary
3	Anjali	Banglore	28	10000
4	Nickky	Delhi	25	6000
6	Virat	Delhi	30	5500

JOIN gives better performance than Sub Queries. Else, the subquery must be passed for each result of the main query. As a result, a joins gives the better results instead of a subquery. but if we see in reality, it all depends on the plan of execution that is made by SQL Server. Hence, if we need to get the output in a quick manner or we do an extraction of data then going with JOIN for data mining is better.

CONCLUDING;
A subquery verifies two identities with proper format for the IN clause. But, if we talk about a large number of data in the database server, use joins queries rather than a subquery because joins takes less time to get the output in data mining.