



Vision of the Department

To be recognized for keeping innovation, research and excellence abreast of learning in the field of computer science & engineering to cater the global society.

Mission of the Department

- M1:** To provide an exceptional learning environment with academic excellence in the field of computer science and engineering.
- M2:** To facilitate the students for research and innovation in the field of software, hardware and computer applications and nurturing to cater the global society.
- M3:** To establish professional relationships with industrial and research organisations to enable the students to be updated of the recent technological advancements.
- M4:** To groom the learners for being the software professionals catering the needs of modern society with ethics, moral values and full of patriotism.

Program Educational Objectives (PEO's)

- PEO1:** The graduate will have the knowledge and skills of major domains of computer science and engineering in providing solution to real world problems most efficiently.
- PEO2:** The graduate will be able to create and use the modern tools and procedures followed in the software industry in the relevant domain.
- PEO3:** The graduate will be following the ethical practices of the software industry and contributing to the society as a responsible citizen.
- PEO4:** The graduate will have the innovative mindset of learning and implementing the latest developments and research outcomes in the computer hardware and software to keep pace with the fast changing socio economic world.



COURSE OUTCOMES

- CO1:** Compare various Data Models with their merits and demerits.
- CO2:** Construct SQL queries using various data manipulation statements.
- CO3:** Apply normalization upto 3NF on given relations.
- CO4:** Demonstrate concurrency control mechanism for database transactions.
- CO5:** Develop triggers and cursors in PL/SQL programming.

LIST OF EXPERIMENTS

1. Write a SQL query to delete duplicate row from the table.
2. Write a SQL query to display the alternate row from table.
3. Write a SQL query to delete alternate row from table.
4. .Write a SQL query updates multiple rows in using single update statement.
5. Write a SQL query to find the third highest paid and third lowest paid salary.
6. Write a SQL query to display the 3rd, 4th, 9th rows from table.
7. Write a SQL query to display the ename, which is start with j, k, l or m.
8. Write a SQL query Show all employees who were hired the first half of the month.
9. Write a pl/sql for select, insert, update and delete statements.
10. Write a pl/sql block to delete a record. If delete operation is successful return 1 else return



EXPERIMENT -1

Aim: Write a SQL query to delete duplicate row from the table.

THEORY

Duplicity in our database tends to be a waste of memory space. It records inaccurate data and is also unable to fetch the correct data from the database. One or more rows that have identical or the same data value are considered to be Duplicate rows. There are a few steps from which a DETAILS table can be created and checked how the deletion of duplicate rows is done.

Steps to complete the tasks are as follows:

Step 1: First we have to create a table named “DETAILS”-

Query:

```
CREATE TABLE DETAILS (  
    SN INT IDENTITY(1,1) PRIMARY KEY,  
    EMPNAME VARCHAR(25) NOT NULL,  
    DEPT VARCHAR(20) NOT NULL,  
    CONTACTNO BIGINT NOT NULL,  
    CITY VARCHAR(15) NOT NULL  
);
```

Step 2: Now, we have to insert values or data in the table.

Query:

```
INSERT INTO DETAILS (EMPNAME, DEPT, CONTACTNO, CITY)  
VALUES  
    ('VISHAL', 'SALES', 9193458625, 'GAZIABAD'),  
    ('VIPIN', 'MANAGER', 7352158944, 'BAREILLY'),  
    ('ROHIT', 'IT', 7830246946, 'KANPUR'),  
    ('RAHUL', 'MARKETING', 9635688441, 'MEERUT'),
```



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('SANJAY', 'SALES', 9149335694, 'MORADABAD'),
('VIPIN', 'MANAGER', 7352158944, 'BAREILLY'),
('VISHAL', 'SALES', 9193458625, 'GAZIABAD'),
('AMAN', 'IT', 78359941265, 'RAMPUR');

Output: we have a view of the Table after inserting the values:

	SN	EMPNAME	DEPT	CONTACTNO	CITY
1	1	VISHAL	SALES	9193458625	GAZIABAD
2	2	VIPIN	MANAGER	7352158944	BAREILLY
3	3	ROHIT	IT	7830246946	KANPUR
4	4	RAHUL	MARKETING	9635688441	MEERUT
5	5	SANJAY	SALES	9149335694	MORADABAD
6	6	VIPIN	MANAGER	7352158944	BAREILLY
7	7	VISHAL	SALES	9193458625	GAZIABAD
8	8	AMAN	IT	78359941265	RAMPUR

Step 3: In this step, we have to find how many rows are duplicated.

Query:

```
SELECT EMPNAME,DEPT,CONTACTNO,CITY,  
COUNT(*) FROM DETAILS  
GROUP BY EMPNAME,DEPT,CONTACTNO,CITY  
HAVING COUNT(*)>1
```

Output:



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	EMPNAME	DEPT	CONTACTNO	CITY	(No column name)
1	VIPIN	MANAGER	7352158944	BARIELLY	2
2	VISHAL	SALES	9193458625	GAZIABAD	2

Step 4: You can also find out the unique row by using this row.

```
SELECT EMPNAME,DEPT,CONTACTNO,CITY,  
COUNT(*) FROM DETAILS  
GROUP BY EMPNAME,DEPT,CONTACTNO,CITY
```

Output:

EMPNAME	DEPT	CONTACTNO	CITY	COUNT(*)
AMAN	IT	78359941265	RAMPUR	1
RAHUL	MARKETING	9635688441	MEERUT	1
ROHIT	IT	7830246946	KANPUR	1
SANJAY	SALES	9149335694	MORADABAD	1
VIPIN	MANAGER	7352158944	BAREILLY	2
VISHAL	SALES	9193458625	GAZIABAD	2

Step 5: Finally we have to delete the duplicate row from the Database.

Query:

```
DELETE FROM DETAILS  
WHERE SN NOT IN (  
SELECT MIN(SN)  
FROM DETAILS  
GROUP BY EMPNAME, DEPT, CONTACTNO, CITY  
);
```




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VIVA QUESTIONS



How do I delete duplicate rows in SQL query?

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How do you remove duplicate rows from a table?

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How to find duplicate rows in MySQL table?

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How to SELECT all duplicate rows in MySQL?

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Aim: Write a SQL query to display the alternate row from table.

THEORY

```
SELECT * FROM EMP WHERE ROWID IN(SELECT DECODE(MOD(ROWNUM,2),0,ROWID) FROM EMP);
```

OR

```
SELECT * FROM GDEPT WHERE ROWID IN(SELECT DECODE(MOD(ROWNUM,2),0,ROWID) FROM GDEPT);
```

To display alternate records from MYSQL table, suppose we have the following records –

```
CREATE TABLE IF NOT EXISTS `empdata` (  
  `id` int(11) NOT NULL AUTO_INCREMENT,  
  `name` char(25) NOT NULL,  
  `email` varchar(100) NOT NULL,  
  `phone` int(11) NOT NULL,  
  PRIMARY KEY (`id`)  
) ENGINE=MyISAM AUTO_INCREMENT=7 DEFAULT CHARSET=latin1;  
  
INSERT INTO `empdata` (`id`, `name`, `email`, `phone`) VALUES  
  
(1, 'Anjali', 'anjali@example.com', 878433948),  
(2, 'Priska', 'priska@example.com', 493905490),  
(3, 'Abhi', 'abhi@example.com', 403022139),  
(4, 'Joya', 'joya@example.com', 342345329),  
(5, 'Ammy', 'ammy@example.com', 239848342),  
(6, 'Lussi', 'lussi@example.com', 490290331);
```

MySQL MOD() method returns the remainder of a number divided by another number. So for getting alternate rows, we can divide the ID with 2 and displays only those having remainder 1.

```
SELECT * FROM empdata GROUP BY id having mod(id,2)=1;
```



Output of the above statement

id	name	email	phone
1	Anjali	anjali@example.com	878433948
3	Abhi	abhi@example.com	403022139
5	Ammy	ammy@example.com	239848342

The above statement returns only ODD rows. If you want to get even rows, write the statement as-

SELECT * FROM empdata GROUP BY id having mod(id,2)=0

Output of the above statement

id	name	email	phone
2	Priska	priska@example.com	493905490
4	Joya	joya@example.com	342345329
6	Lussi	lussi@example.com	490290331



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VIVA QUESTIONS



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Q.1.How to get alternate rows from a table in SQL?

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Q.2.What is the alternate name of row in table in SQL?

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Q.3.What is a query in SQL?

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Q.4.What are the 4 types of queries?

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EXPERIMENT -3

Aim: Write a SQL query to delete alternate row from table.

THEORY

```
DELETE FROM GDEPT WHERE ROWID IN(DELETE  
DECODE(MOD(ROWNUM,2),0,ROWID) FROM GDEPT);
```

To delete alternate rows from MYSQL table, suppose we have the following employee records –

```
CREATE TABLE IF NOT EXISTS `empdata` (  
  
  `id` int(11) NOT NULL AUTO_INCREMENT,  
  
  `name` char(25) NOT NULL,  
  
  `email` varchar(100) NOT NULL,  
  
  `phone` int(11) NOT NULL,  
  
  PRIMARY KEY (`id`)  
  
) ENGINE=MyISAM AUTO_INCREMENT=7 DEFAULT CHARSET=latin1;  
  
INSERT INTO `empdata` (`id`, `name`, `email`, `phone`) VALUES  
  
(1, 'Anjali', 'anjali@example.com', 878433948),  
  
(2, 'Priska', 'priska@example.com', 493905490),  
  
(3, 'Abhi', 'abhi@example.com', 403022139),  
  
(4, 'Joya', 'joya@example.com', 342345329),  
  
(5, 'Ammy', 'ammy@example.com', 239848342),  
  
(6, 'Lussi', 'lussi@example.com', 490290331);
```



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MySQL MOD() method returns the remainder of a number divided by another number. So for getting alternate rows, we can divide the ID with 2 and fetch only those having remainder 1 and delete them.

```
DELETE FROM empdata
```

```
WHERE id IN(
```

```
  SELECT *
```

```
  FROM (
```

```
    SELECT id FROM empdata GROUP BY id having mod(id,2)=1
```

```
  )temp
```

```
);
```

```
SELECT * FROM `empdata`
```

Output of the above statement

id	name	email	phone
4	Joya	joya@example.com	342345329
2	Priska	priska@example.com	493905490
6	Lussi	lussi@example.com	490290331

The above statement deletes only ODD rows. If you want to delete even rows, write the statement as-

```
DELETE FROM empdata
```

```
WHERE id IN(
```

```
  SELECT *
```

```
  FROM (
```

```
    SELECT id FROM empdata GROUP BY id having mod(id,2)=0
```

```
  )temp
```




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);

SELECT * FROM `empdata`;

Output of the above statement

id	name	email	phone
5	Ammy	ammy@example.com	239848342
3	Abhi	abhi@example.com	403022139
1	Anjali	anjali@example.com	878433948



VIVA QUESTIONS

Q.1.What is the query in SQL to delete a row from a table?

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Q.2.What is the difference between DELETE and truncate?

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Q.3.Does TRUNCATE lock the table?

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Q.4.Is TRUNCATE DDL or DML?

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EXPERIMENT -4

Aim: Write a SQL query updates multiple rows in using single update statement.

THEORY

Column values on multiple rows can be updated in a single UPDATE statement if the condition specified in WHERE clause matches multiple rows. In this case, the SET clause will be applied to all the matched rows.

Example

Suppose we have a table 'tender' as follows –

```
mysql> Select * from tender;
+-----+-----+-----+
| tender_id | company | rate |
+-----+-----+-----+
| 200      | ABC     | 1000 |
| 300      | ABD     | 5000 |
| 301      | ABE     | 6000 |
| 302      | ABF     | 2500 |
| 303      | ABG     | 2600 |
+-----+-----+-----+
5 rows in set (0.00 sec)
```

Now if we want to update the 'rate' column where tender_id is greater than or equal to 300 then we can use the following query –

```
mysql> UPDATE tender SET rate = rate + 1000 WHERE tender_id >= 300;
```

Query OK, 4 rows affected (0.07 sec)

Rows matched: 4 Changed: 4 Warnings: 0

```
mysql> Select * from tender;
```

We can observe from the above result set that the values in multiple rows, having tender_id >= 300, has been updated.



VIVA QUESTIONS

Q.1.How to UPDATE multiple rows with different condition in SQL?

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Q.2.What is updating a single row in SQL?

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Q.3.What is an update query used

for?

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Q.4.What is the syntax for UPDATE query?

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EXPERIMENT -5

1. **Aim:** Write a SQL query to find the third highest paid and third lowest paid salary.

```
SOL: SELECT MAX(SAL) FROM EMP WHERE
SAL<(SELECT MAX(SAL) FROM EMP WHERE
SAL<(SELECT MAX(SAL) FROM EMP));
SOL: SELECT ENAME,SAL FROM EMP
MINUS
SELECT ENAME,SAL FROM EMP WHERE
SAL>(SELECT MIN(SAL) FROM EMP WHERE
SAL>(SELECT MIN(SAL) FROM EMP WHERE
SAL>(SELECT MIN(SAL) FROM EMP WHERE
SAL>(SELECT MIN(SAL) FROM EMP))));
```

EXAMPLE: Consider the following table:

Employee

ename	sal
A	23000
B	31000
C	24500
D	35000
E	28500
F	31500
G	39800
H	51000
I	39800

Query :

```
select * from(
```

```
select ename, sal, dense_rank()
```

```
over(order by sal desc)r from Employee)
```

```
where r=&n;
```




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VIVA QUESTIONS

Q.1.How do you find the third lowest salary in SQL?

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Q.2.How to find Nth highest salary from a table?

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Q.3.How to insert 3 values in SQL?

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EXPERIMENT -6

Aim: Write a SQL query to display the 3rd, 4th, 9th rows from table.

THEORY

```
SELECT * FROM DEPT WHERE ROWID NOT IN(SELECT ROWID FROM DEPT WHERE  
ROWNUM<=(SELECT COUNT(*)-&3 FROM DEPT));
```

```
SELECT * FROM DEPT WHERE ROWID NOT IN(SELECT ROWID FROM DEPT WHERE  
ROWNUM<=(SELECT COUNT(*)-&4 FROM DEPT));
```

```
SELECT * FROM DEPT WHERE ROWID NOT IN(SELECT ROWID FROM DEPT WHERE  
ROWNUM<=(SELECT COUNT(*)-&9 FROM DEPT));
```

EXAMPLE

```
CREATE TABLE IF NOT EXISTS `empdata` (  
  `id` int(11) NOT NULL AUTO_INCREMENT,  
  `name` char(25) NOT NULL,  
  `address` varchar(100) NOT NULL,  
  `phone` int(11) NOT NULL,  
  PRIMARY KEY (`id`)  
) ENGINE=MyISAM AUTO_INCREMENT=7 DEFAULT CHARSET=latin1;  
  
INSERT INTO `empdata` (`id`, `name`, `address`, `phone`) VALUES  
  
(6, 'Lussi', 'K-91, Roy Apartment', 909030309),  
  
(4, 'Joya', '15, CP Colony', 342345329),  
  
(5, 'Ammy', '25, JP Colony', 239848342),  
  
(2, 'Priska', '122, JP Colony', 890040908),  
  
(3, 'Abhi', '5, Bank Street', 675748389),
```



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(1, 'Anjali', '121, Vakundh Dham', 840932345);

Display the 3rd row from the MySQL 'empdata' table

```
SELECT * FROM `empdata` ORDER BY ID LIMIT 1 OFFSET 2
```

This returns the following output –

id	name	address	phone
3	Abhi	5, Bank Street	675748389

Display from the 4rd row from the MySQL 'empdata' table, set limit 3

```
SELECT * FROM `empdata` ORDER BY ID LIMIT 3 OFFSET 3
```

This returns the following output –

id	name	address	phone
4	Joya	15, CP Colony	342345329
5	Ammy	25, JP Colony	239848342
6	Lussi	K-91, Roy Apartment	909030309

Display from the 5th row from the MySQL 'empdata' table, set limit 2 and order by name

```
SELECT * FROM `empdata` ORDER BY name LIMIT 2 OFFSET 4;
```

This returns the following output –



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id	name	address	phone
6	Lussi	K-91, Roy Apartment	909030309
2	Priska	122, JP Colony	890040908



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How do I query the number of rows in SQL?

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How do I show last 10 rows in SQL?

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How to read last 5 rows in SQL?

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How do I SELECT random 10 rows in a table?

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EXPERIMENT -7

Aim: Write a SQL query to display the ename, which is start with j, k, l or m.

THEORY

- SELECT - extracts data from a database.
- UPDATE - updates data in a database.
- DELETE - deletes data from a database.
- INSERT INTO - inserts new data into a database.
- CREATE DATABASE - creates a new database.
- ALTER DATABASE - modifies a database.
- CREATE TABLE - creates a new table.

To select the first name and last name from the table

SELECT first_name "First Name", last_name "Last Name"

FROM table name;

select ename

from employees

where name like 'J%'

or name like 'K%'

or name like 'L%' or name like 'M%' ;

OR

select ename

from

employees

where name like '[JKLM]%'

ASSIGNMENT



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Write a query to find that how many employees are there whose name ends with N?

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VIVA QUESTIONS



Q.1.How to display first letter of first name in SQL?

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Q.2.How to use starts with in SQL query?

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Q.4.How to write SQL query for first name and last name?

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EXPERIMENT -8

Aim: Write a SQL query Show all employees who were hired the first half of the month.

THEORY

```
SELECT last_name, hire_date
```

```
FROM employees
```

```
WHERE hire_date < trunc(sysdate,'MM')+15;
```

ASSIGNMENT



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Write a query to find the data of that entire employee whose name ends with t?

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VIVA QUESTIONS



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Q.1.How to find all the employees who were hired on the last day of the month in SQL?

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Q.2.How to find the employees who have been hired in the last three months in SQL?

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Q.3.How do you display those employees who joined in the company in the month of December?

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Aim: Write a pl/sql for select, insert, update and delete statements.

THEORY

DML Transactions in PL/SQL

DML stands for Data Manipulation Language. These statements are mainly used to perform the manipulation activity. It deals with the below operations.

- Data Insertion
- Data Update
- Data Deletion
- Data Selection

In PL/SQL, we can do the data manipulation only by using the SQL commands.

Data Insertion

In PL/SQL, we can insert the data into any table using the SQL command INSERT INTO. This command will take the table name, table column and column values as the input and insert the value in the base table.

The INSERT command can also take the values directly from another table using 'SELECT' statement rather than giving the values for each column. Through 'SELECT' statement, we can insert as many rows as the base table contains.

BEGIN

```
INSERT INTO <table_name>(<column1 >,<column2>,...<column_n>)
```

```
VALUES(<value1><value2>,...:<value_n>);
```

END;

- The above syntax shows the INSERT INTO command. The table name and values are mandatory fields, whereas column names are not mandatory if the insert statements have values for all the column of the table.
- The keyword 'VALUES' is mandatory if the values are given separately as shown above.

BEGIN

```
INSERT INTO <table_name>(<column1>,<column2>,...,<column_n>)
```

```
SELECT <column1>,<column2>,.. <column_n> FROM <table_name2>;
```



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END;

- The above syntax shows the INSERT INTO command that takes the values directly from the <table_name2> using the SELECT command.
- The keyword 'VALUES' should not be present in this case as the values are not given separately.

Data Update

Data update simply means an update of the value of any column in the table. This can be done using 'UPDATE' statement. This statement takes the table name, column name and value as the input and updates the data.

BEGIN

```
UPDATE <table_name>  
SET <column1>=<VALUE1>,<column2>=<value2>,<column_n>=<value_n>  
WHERE <condition that uniquely identifies the record that needs to be update>;  
END;
```

- The above syntax shows the UPDATE. The keyword 'SET' instruct that PL/SQL engine to update the value of the column with the value given.
- 'WHERE' clause is optional. If this clause is not given, then the value of the mentioned column in the entire table will be updated.

Data Deletion

Data deletion means to delete one full record from the database table. The 'DELETE' command is used for this purpose.

BEGIN

```
DELETE  
FROM  
<table_name>  
WHERE <condition that uniquely identifies the record that needs to be update>;  
END;
```

- The above syntax shows the DELETE command. The keyword 'FROM' is optional and with or without 'FROM' clause the command behaves in the same way.
- 'WHERE' clause is optional. If this clause is not given, then the entire table will be deleted.



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Data Selection

Data projection/fetching means to retrieve the required data from the database table. This can be achieved by using the command 'SELECT' with 'INTO' clause. The 'SELECT' command will fetch the values from the database, and 'INTO' clause will assign these values to the local variable of the PL/SQL block.

Below are the points that need to be considered in 'SELECT' statement.

- 'SELECT' statement should return only one record while using 'INTO' clause as one variable can hold only one value. If the 'SELECT' statement returns more than one value than 'TOO_MANY_ROWS' exception will be raised.
- 'SELECT' statement will assign the value to the variable in the 'INTO' clause, so it needs to get at least one record from the table to populate the value. If it didn't get any record, then the exception 'NO_DATA_FOUND' is raised.
- The number of columns and their datatype in 'SELECT' clause should match with the number of variables and their datatypes in the 'INTO' clause.
- The values are fetched and populated in the same order as mentioned in the statement.
- 'WHERE' clause is optional that allows to having more restriction on the records that are going to be fetched.
- 'SELECT' statement can be used in the 'WHERE' condition of other DML statements to define the values of the conditions.
- The 'SELECT' statement when using 'INSERT', 'UPDATE', 'DELETE' statements should not have 'INTO' clause as it will not populate any variable in these cases.

BEGIN

```
SELECT <column1>,..<column_n> INTO <variable 1 >,.. <variable_n>
```

```
FROM <table_name>
```

```
WHERE <condition to fetch the required records>;
```

END;

- The above syntax shows the SELECT-INTO command. The keyword 'FROM' is mandatory that identifies the table name from which the data needs to be fetched.
- 'WHERE' clause is optional. If this clause is not given, then the data from the entire table will be fetched.



VIVA QUESTIONS

Q.1.What is INSERT, UPDATE and DELETE statement in SQL?

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Q.2.What is PL/ SQL?

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Q.3.Which statement is used to insert update or DELETE bulk data in PL SQL?

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Q.4.Which category of SQL statement contains the SELECT insert update and DELETE commands?

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Aim: Write a pl/sql block to delete a record. If delete operation is successful return 1 else return 0.

THEORY

PL/SQL stands for Procedural Language/SQL. PL/SQL extends SQL by adding constructs found in procedural languages, resulting in a structural language that is more powerful than SQL. The basic unit in PL/SQL is a block, All PL/SQL programs are made up of blocks, which can be nested within each other. Typically, each block performs a logical action in the program.

Types in PL/SQL can be tricky. In many cases, a PL/SQL variable will be used to manipulate data stored in a existing relation. In this case, it is essential that the variable have the same type as the relation column. If there is any type mismatch, variable assignments and comparisons may not work the way you expect. To be safe, instead of hard coding the type of a variable, you should use the %TYPE operator

PROGRAM

```
create or replace function fun3(n emp.empno%type) return number is
```

```
a number;
```

```
begin
```

```
delete from emp where empno=n;
```

```
if sql%found then
```

```
return 1;
```

```
else
```

```
return 0;
```

```
end if;
```

```
--exception
```

```
--when no_data_found then
```

```
--return 100;
```

```
end;
```

```
declare
```

```
n number;
```

```
begin
```



```
n:=fun3(&empno);
```

```
dbms_output.put_Line(n);
```

```
if n=0 then
```

```
dbms_output.put_line('deletion unsuccessful');
```

```
elsif n=1 then
```

ASSIGNMENT

Write a query to run grant and revoke command ?



LAKSHMI NARAIN COLLEGE OF TECHNOLOGY & SCIENCE, BHOPAL

CS-502

Data Base Management System Laboratory

Dotted lines for writing answers.

VIVA QUESTIONS

Q.1.How to delete a record type in pl/sql?



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Q.2.How to delete procedure in pl/sql?

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Q.3.How to write a PL SQL block in Oracle?

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Q.4.How to delete database in pl/sql?

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