PostgreSQL

Lesson 3: PostgreSQL - Retrieving data

Lesson Objectives

In this lesson, you will learn about:

- SELECT statement
- Operators in PostgreSQL
- Using WHERE clause
- LIMIT key word
- ORDER BY clause
- GROUP BY clause
- HAVING clause
- DISTINCT key word

SELECT statement

▪PostgreSQL SELECT statement is used to fetch the data from a database table which returns data in the form of result set

```
SELECT * FROM table_name;
```

▪Example:

```
SELECT * FROM employee;
```

▪We can use arithmetic operators in SELECT statement:

```
SELECT name, salary*12 FORM employee;
```

▪Column name can be given alias name:

```
SELECT name, salary*12 annual_sal FORM employee;
```

▪Here “annual_sal” is an alias name

Operators in PostgreSQL

- Operators are used to perform arithmetic operations and comparison operations
- Operators are used to specify conditions and serve as conjunction for multiple conditions in a statement
- Types of operators:
  - Arithmetic

+ - * / % ^(exponentiation) |/ (square root) ||/ (cube root) !/(factorial)

  - Comparison

= != <> > < >= <=

AND OR NOT

Operators in PostgreSQL

- Using numeric expressions:

```
select 24*4 as product;
```

- Date expression gives current date and time:

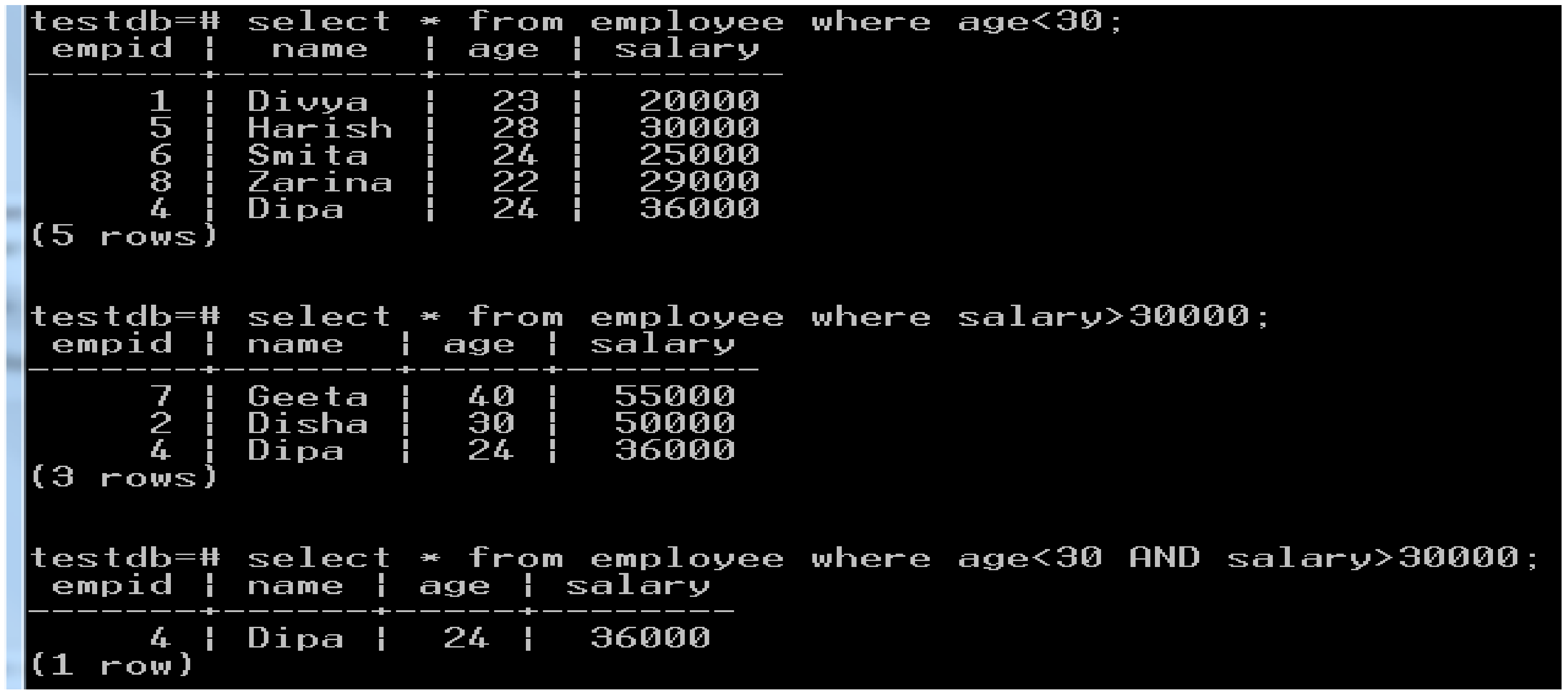
```
select CURRENT_TIMESTAMP;
```

Using WHERE clause

- In PostgreSQL WHERE clause is used to specify a condition while fetching data from one table or joining it with multiple tables
- It returns specific values from the table if the given condition is satisfied
- WHERE clause can be used in SELECT, UPDATE and DELETE statement
- Using comparison operators in SELECT statement:

Using WHERE clause

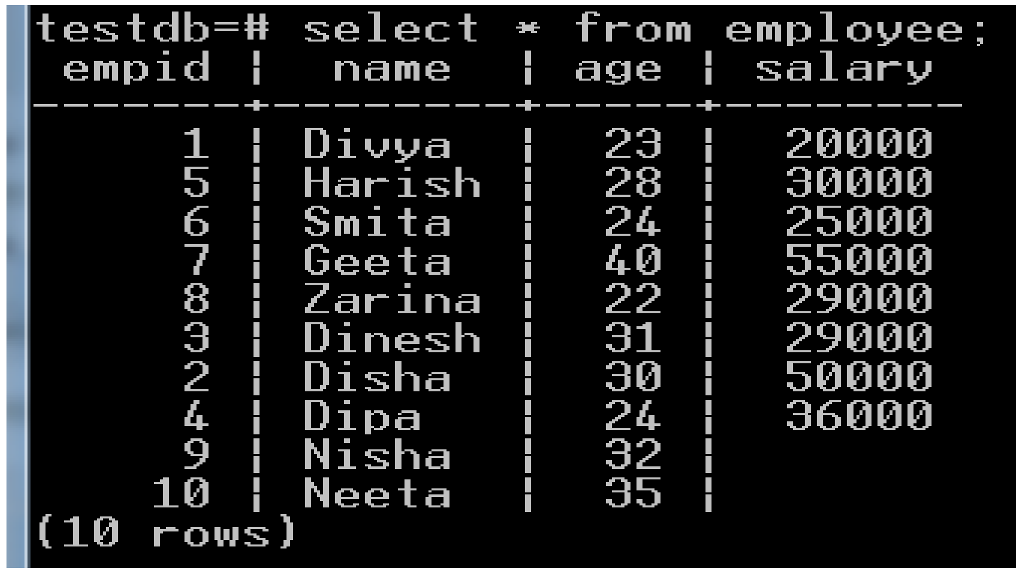
- WHERE clause can be used in SELECT, UPDATE and DELETE statement
- Using comparison operators in SELECT statement:



```
testdb=# select * from employee where age<30;
 empid |  name   | age | salary
-------+---------+-----+--------
     1 | Divya   |  23 |  20000
     5 | Harish  |  28 |  30000
     6 | Smita   |  24 |  25000
     8 | Zarina  |  22 |  29000
     4 | Dipa    |  24 |  36000
(5 rows)


testdb=# select * from employee where salary>30000;
 empid | name   | age | salary
-------+--------+-----+--------
     7 | Geeta  |  40 |  55000
     2 | Disha  |  30 |  50000
     4 | Dipa   |  24 |  36000
(3 rows)


testdb=# select * from employee where age<30 AND salary>30000;
 empid | name | age | salary
-------+------+-----+--------
     4 | Dipa |  24 |  36000
(1 row)
```



```
testdb=# select * from employee;
 empid |  name   | age | salary
-------+---------+-----+--------
     1 | Divya   |  23 |  20000
     5 | Harish  |  28 |  30000
     6 | Smita   |  24 |  25000
     7 | Geeta   |  40 |  55000
     8 | Zarina  |  22 |  29000
     3 | Dinesh  |  31 |  29000
     2 | Disha   |  30 |  50000
     4 | Dipa    |  24 |  36000
     9 | Nisha   |  32 |
    10 | Neeta   |  35 |
(10 rows)
```

Using WHERE clause

- Using OR and NOT:

```
select * from employee where age<30 OR salary>30000
select * from employee where salary IS NOT NULL;
```

- Using special operators like IN, between and :

```
select * from employee where salary between 25000 and 30000;
select * from employee where age IN (28,30);
```

- **Using LIKE operator to match wild card characters _ and %:**

```
      select * from employee where name LIKE 'Di%';
select * from employee where name LIKE '___ta';
```

- _ is for single character and % is for 1 or more characters

LIMIT clause

- LIMIT clause limits the data returned by the SELECT statement
- Example : if we need first four rows in employee table then

```
select * from employee limit 4;
```

- To display data starting from row 4, show next 2 rows we should use:

```
select * from employee limit 2 offset 3;
```

- Limit 2 is number of rows and
- offset 3 means start from row 4

ORDER BY clause

- PostgreSQL sorts the data in ascending or descending order, based on 1 or more columns
- Example : Sort employee data according to age:

```
select * from employee order by age;
```

- Sort employee data according to deptno and then by name:

```
select * from employee order by deptno, name;
```

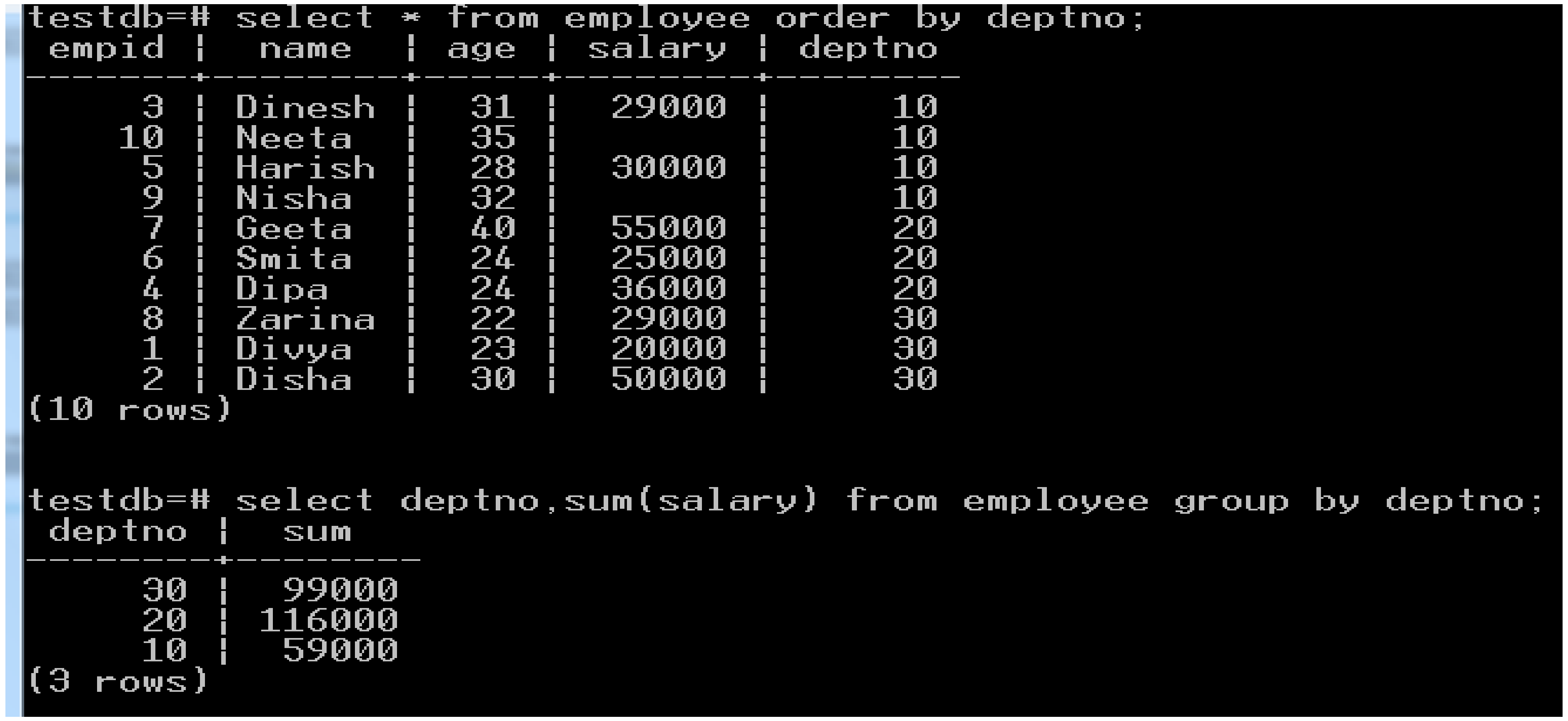
- Sort employee data according to salary in descending order:

```
select * from employee order by salary desc;
```

GROUP BY clause

- GROUP BY clause is used in SELECT statement to group together rows in the table that have identical data
- Example :

select deptno, sum(salary) from employee GROUP BY deptno;



```
testdb=# select * from employee order by deptno;
 empid |  name  | age | salary | deptno
-------+--------+-----+--------+--------
     3 | Dinesh |  31 |  29000 |     10
    10 | Neeta  |  35 |        |     10
     5 | Harish |  28 |  30000 |     10
     9 | Nisha  |  32 |        |     10
     7 | Geeta  |  40 |  55000 |     20
     6 | Smita  |  24 |  25000 |     20
     4 | Dipa   |  24 |  36000 |     20
     8 | Zarina |  22 |  29000 |     30
     1 | Divya  |  23 |  20000 |     30
     2 | Disha  |  30 |  50000 |     30
(10 rows)

testdb=# select deptno,sum(salary) from employee group by deptno;
 deptno |  sum
--------+--------
     30 |  99000
     20 | 116000
     10 |  59000
(3 rows)
```

HAVING clause

- HAVING clause restricts groups
- WHERE clause places conditions on the selected columns, whereas the HAVING clause places conditions on groups created by the GROUP BY clause
- Example: Get data for those departments which have average salary more that 30000

```
select deptno, avg(salary) from employee group by deptno having avg(salary)>30000 ;
```

- Get all department numbers which have less then 4 employees

```
select deptno, count(*) from employee group by deptno having count(*)<4;
```

DISTINCT key word

- DISTINCT clause gets unique values after removing duplicate values from the data
- Example : if we need to get all deptno values in employee table then

```
select DISTINCT deptno from employee;
```

- To display data starting from row 4, show next 2 rows we should use:

```
select * from employee limit 2 offset 3;
```

- Limit 2 is number of rows and
- offset 3 means start from row 4

Lab

Lab 2

Summary

In this lesson, you have learn about:

- Use SELECT statement to retrieve rows form table in database
- WHERE clause will restrict data based on conditions
- Aggregate functions can be used with GROUP BY clause and HAVING clause will restrict groups
- DISTICT key word will help remove duplicate values

Review Question

Question 1: We need employees who work in department 10 and have salaries in the range 20000 and 30000. Which of the following is a correct query?

- Select * from emp where deptno=10 and salary IN (20000,30000)
- Select * from emp where deptno=10 and salary between 20000 and 30000
- Select * from emp where deptno=10 or salary between 20000 and 30000

Question 2: Which of the following is useful to get unique values from a repeated group?

- Distinct
- Primary key
- Unique

People matter, results count.

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