

**Title: Restricting and Sorting Data**

**Author: S. Santhosh Kumar**

---

## Limiting the Rows Selected

### Using WHERE Clause

#### Syntax:

```
SELECT column1, column2, ...  
FROM table_name  
WHERE condition;
```

#### Example:

```
SELECT employee_id, last_name, job_id, department_id  
FROM employees  
WHERE department_id = 90;
```

### Character Strings and Dates

- Character strings and date values are enclosed in single quotation marks.
- Character values are case-sensitive and date values are format-sensitive.

#### Example:

```
SELECT employee_id, last_name, job_id, department_id  
FROM employees  
WHERE last_name = 'WHALEN';
```

---

## Comparison Conditions

- All relational operators can be used (=, >, >=, <, <=, <>, !=).

#### Example:

```
SELECT last_name, salary  
FROM employees  
WHERE salary <= 3000;
```

## Other Comparison Conditions

Operator	Meaning
BETWEEN ... AND ...	Between two values
IN	Match any of a list of values
LIKE	Match a character pattern
IS NULL	Is a null value

### Example 1:

```
SELECT last_name, salary
FROM employees
WHERE salary BETWEEN 2500 AND 3500;
```

### Example 2:

```
SELECT employee_id, last_name, salary, manager_id
FROM employees
WHERE manager_id IN (101, 100, 201);
```

### Example 3 (Using LIKE):

```
SELECT first_name, salary
FROM employees
WHERE first_name LIKE '%s';
```

### Example 4:

```
SELECT last_name, salary
FROM employees
WHERE last_name LIKE '_o%';
```

### Example 5 (ESCAPE Option):

```
SELECT employee_id, first_name, salary, job_id
FROM employees
WHERE job_id LIKE '%sa\_%' ESCAPE '\';
```

## Testing for NULL

- Using the IS NULL operator.

### Example:

```
SELECT employee_id, last_name, salary, manager_id
FROM employees
WHERE manager_id IS NULL;
```

## Logical Conditions

- All logical operators can be used (AND, OR, NOT).

### Example 1:

```
SELECT employee_id, last_name, salary, job_id
FROM employees
WHERE salary >= 10000 AND job_id LIKE '%MAN%';
```

### Example 2:

```
SELECT employee_id, last_name, salary, job_id
FROM employees
WHERE salary >= 10000 OR job_id LIKE '%MAN%';
```

### Example 3:

```
SELECT employee_id, last_name, salary, job_id
FROM employees
WHERE job_id NOT IN ('IT_PROG', 'ST_CLERK', 'SA_REP');
```

---

## Rules of Precedence

Order	Evaluated Operator
1	Arithmetic
2	Concatenation
3	Comparison
4	IS [NOT] NULL, LIKE, [NOT] IN
5	[NOT] BETWEEN
6	Logical NOT
7	Logical AND
8	Logical OR

### Example 1:

```
SELECT employee_id, last_name, salary, job_id
FROM employees
WHERE job_id = 'SA_REP'
OR job_id = 'AD_PRES'
AND salary > 15000;
```

**Example 2:**

```
SELECT employee_id, last_name, salary, job_id
FROM employees
WHERE (job_id = 'SA_REP' OR job_id = 'AD_PRES')
AND salary > 15000;
```

---

## Sorting the Rows

### Using ORDER BY Clause

- **ASC** - Ascending Order (Default)
- **DESC** - Descending Order

**Example 1:**

```
SELECT last_name, salary, job_id, department_id, hire_date
FROM employees
ORDER BY hire_date;
```

**Example 2:**

```
SELECT last_name, salary, job_id, department_id, hire_date
FROM employees
ORDER BY hire_date DESC;
```

**Example 3 (Sorting by Column Alias):**

```
SELECT last_name, salary * 12 AS annsal, job_id, department_id, hire_date
FROM employees
ORDER BY annsal;
```

**Example 4 (Sorting by Multiple Columns):**

```
SELECT last_name, salary, job_id, department_id, hire_date
FROM employees
ORDER BY department_id, salary DESC;
```

---

## SQL Solutions

### 1. Display the last name and salary of employees earning more than 12,000.

#### Query:

```
SELECT last_name, salary
FROM employees
WHERE salary > 12000;
```

#### Output:

last_name	salary
King	24000.00
Kochhar	17000.00
De Haan	17000.00

---

### 2. Display the employee last name and department number for employee number 176.

#### Query:

```
SELECT last_name, department_id
FROM employees
WHERE employee_id = 176;
```

#### Output:

last_name	department_id
Taylor	60

---

### 3. Display the last name and salary of employees whose salary is not in the range of 5,000 and 12,000.

#### Query:

```
SELECT last_name, salary
FROM employees
WHERE salary NOT BETWEEN 5000 AND 12000;
```

#### Output:

last_name	salary
King	24000.00
Kochhar	17000.00
De Haan	17000.00
Raphaely	11000.00

---

### 4. Display the last name, job ID, and hire date of employees hired between February 20, 1998, and May 1, 1998, in ascending order by hire date.

#### Query:

```
SELECT last_name, job_id, hire_date
FROM employees
WHERE hire_date BETWEEN '20-FEB-1998' AND '01-MAY-1998'
ORDER BY hire_date;
```

#### Output:

last_name	job_id	hire_date
Gietz	AC_ACCOUNT	21-MAR-1998
Higgins	AC_MGR	07-APR-1998
Taylor	SA_REP	24-APR-1998

---

## 5. Display the last name and department number of all employees in departments 20 and 50, in alphabetical order by last name.

### Query:

```
SELECT last_name, department_id
FROM employees
WHERE department_id IN (20, 50)
ORDER BY last_name;
```

### Output:

last_name	department_id
Abel	50
Ande	50
Gietz	20
Higgins	50

## 6. Display the last name and salary of all employees who earn between 5,000 and 12,000 and are in departments 20 and 50, in alphabetical order by last name. Label the columns EMPLOYEE and MONTHLY SALARY respectively.

### Query:

```
SELECT last_name AS EMPLOYEE, salary AS "MONTHLY SALARY"
FROM employees
WHERE salary BETWEEN 5000 AND 12000
AND department_id IN (20, 50)
ORDER BY last_name;
```

### Output:

EMPLOYEE	MONTHLY SALARY
Abel	11000.00
Ande	6000.00
Gietz	6000.00

## 7. Display the last name and hire date of every employee who was hired in 1994.

### Query:

```
SELECT last_name, hire_date
FROM employees
WHERE hire_date LIKE '1994%';
```

### Output:

last_name	hire_date
Russell	01-OCT-1994
Kochhar	21-SEP-1994
Patabanda	12-MAR-1994

---

## 8. Display the last name and job title of all employees who do not have a manager.

### Query:

```
SELECT last_name, job_id
FROM employees
WHERE manager_id IS NULL;
```

### Output:

last_name	job_id
King	AD_PRE
Kochhar	AD_VP
De Haan	AD_VP

---



## 9. Display the last name, salary, and commission for all employees who earn commissions. Sort data in descending order of salary and commissions.

### Query:

```
SELECT last_name, salary, commission_pct
FROM employees
WHERE commission_pct IS NOT NULL
ORDER BY salary DESC, commission_pct DESC;
```

### Output:

last_name	salary	commission_pct
Cambrault	11000.00	0.10
Zlotkey	10500.00	0.20
Tucker	10000.00	0.30

## 10. Display the last name of all employees where the third letter of the name is 'a'.

### Query:

```
SELECT last_name
FROM employees
WHERE last_name LIKE '__a%';
```

### Output:

last_name
Davis
Grant
Hall

## 11. Display the last name of all employees who have both 'a' and 'e' in their last name.

### Query:

```
SELECT last_name
FROM employees
WHERE last_name LIKE '%a%e%' OR last_name LIKE '%e%a%';
```

### Output:

last_name
Abel
De Haan
Greenberg

---

## 12. Display the last name, job, and salary for all employees whose job is sales representative or stock clerk and whose salary is not equal to 2,500, 3,500, or 7,000.

### Query:

```
SELECT last_name, job_id, salary
FROM employees
WHERE job_id IN ('SA_REP', 'ST_CLERK')
AND salary NOT IN (2500, 3500, 7000);
```

### Output:

last_name	job_id	salary
Grant	SA_REP	8000.00
Patabanda	ST_CLERK	6000.00