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

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**Branch: - CSE-IOT** **Section/Group:-A**
**Semester:- 3RD** **Date of Performance:- 26/08/2021**
**Subject Name:- DBMS LAB** **Subject Code:-20CSP-232**

## 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.

- **DDL:-** DDL or Data Definition Language actually consists of the SQL commands that can be used to define the database schema. It is used to create /delete/ modify table structure.

### Rules for naming table/columns.

- Table names and column names:
  - Must begin with a letter
  - Must be 1–30 characters long
  - Must contain only A–Z, a–z, 0–9, _, $, and #
  - Must not duplicate the name of another object owned by the same user
  - Must not be an Oracle server–reserved word

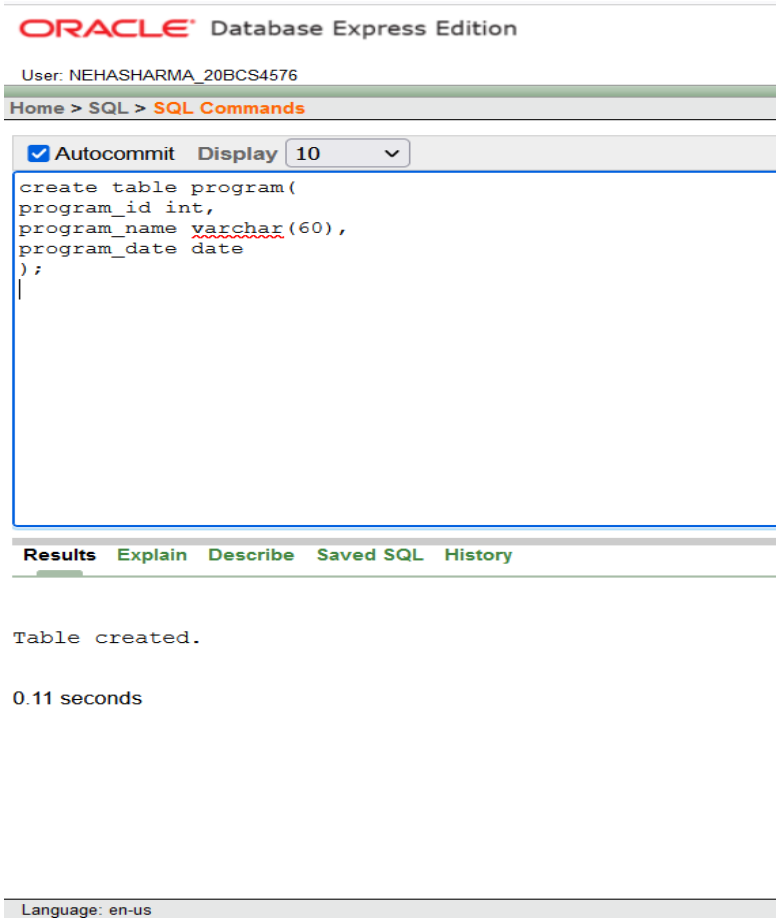
## CREATE TABLE command

- **Purpose:** It is used to create table with specified structure It consists of rows and columns. Each column has a minimum of three attributes- a name, a data type, and size(i.e. column width).

- **Syntax:-**
  Create table <TableName> (<ColumnName1> <Data Type>(<Size>), <ColumnName2> <Data Type>(<Size>), ……..<ColumnName n> <Data Type>(<Size>));

## Examples:

- **TABLE 1**



- **TABLE 2**

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
create table films(
actor varchar(60),
actress char(70),
director varchar(40)
);
```

Results Explain Describe Saved SQL History

```
Table created.
```

2.98 seconds

Language: en-us

- **TABLE 3**

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
create table university(
student_name varchar(60),
student_age int,
student_uid int,
passout_year int
);
```

Results Explain Describe Saved SQL History

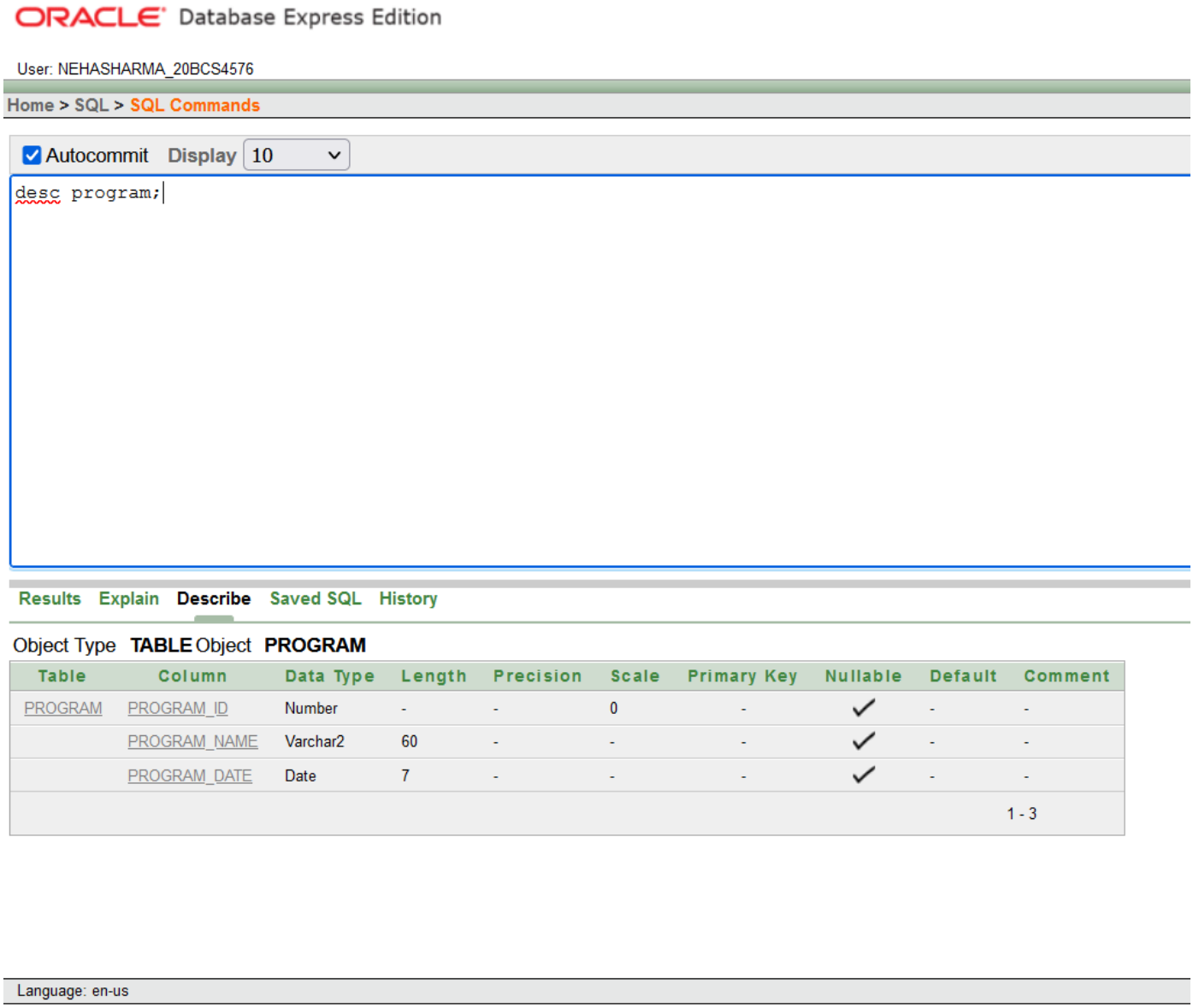
```
Table created.
```

0.36 seconds

Language: en-us

- Displaying the Table Structure
- DESCRIBE(DESC) command
- Purpose: It is used to view table structure
- Syntax: desc table_name;
- Examples: viewing structure of above created tables

1. **TABLE**



## 2. TABLE

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
desc films;
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **FILMS**

| Table | Column | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|---|---|---|---|---|---|---|---|---|---|
| FILMS | ACTOR | Varchar2 | 60 | - | - | - | ✓ | - | - |
| | ACTRESS | Char | 70 | - | - | - | ✓ | - | - |
| | DIRECTOR | Varchar2 | 40 | - | - | - | ✓ | - | - |

1 - 3

Language: en-us

## 3. TABLE

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
desc university;
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **UNIVERSITY**

| Table | Column | Data Type | Length | Precision | Scale | Primary Key | Nullable | Default | Comment |
|---|---|---|---|---|---|---|---|---|---|
| UNIVERSITY | STUDENT_NAME | Varchar2 | 60 | - | - | - | ✓ | - | - |
| | STUDENT_AGE | Number | - | - | 0 | - | ✓ | - | - |
| | STUDENT_UID | Number | - | - | 0 | - | ✓ | - | - |
| | PASSOUT_YEAR | Number | - | - | 0 | - | ✓ | - | - |

1 - 4

Language: en-us

## CREATE TABLE FROM ANOTHER TABLE

**Purpose: We can create a copy of an existing table using the create table command.**

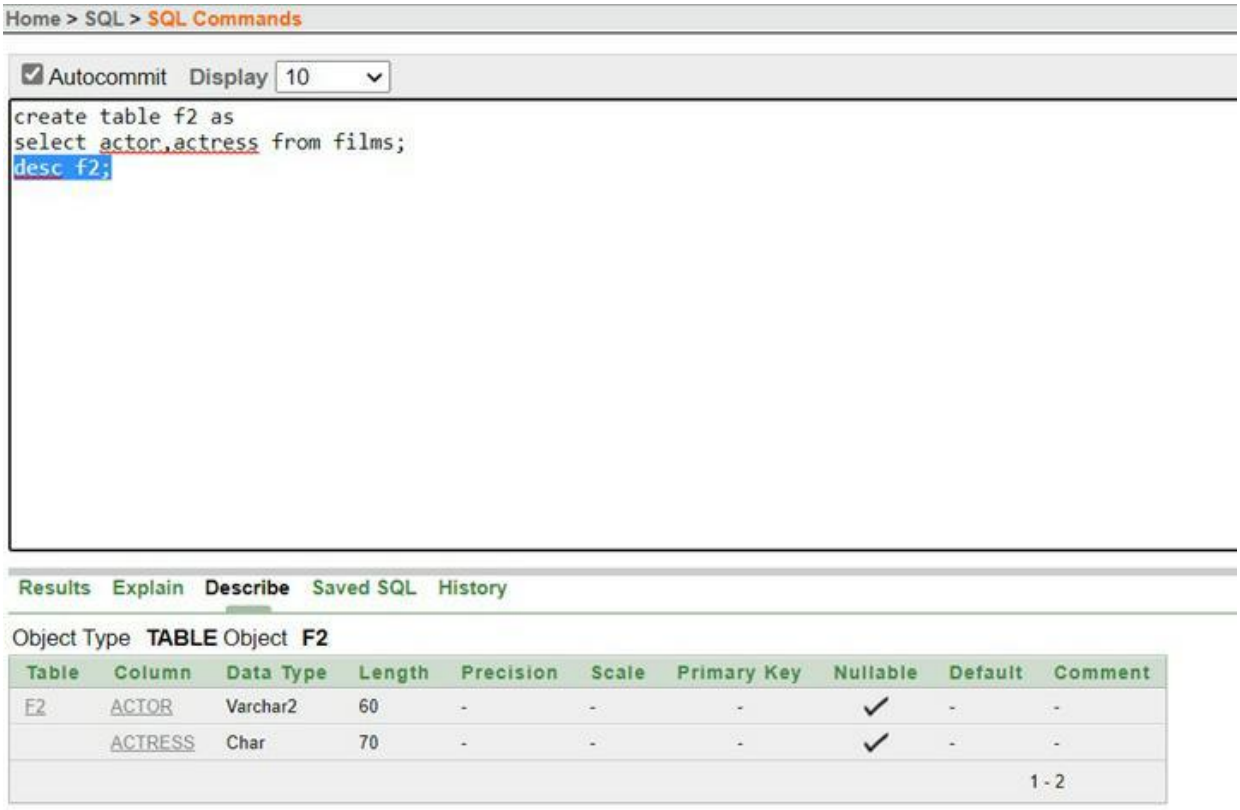
**Syntax:**

CREATE TABLE table_name AS

SELECT column1, column2,...

FROM old_table_name WHERE ..... condition....

**Example:**



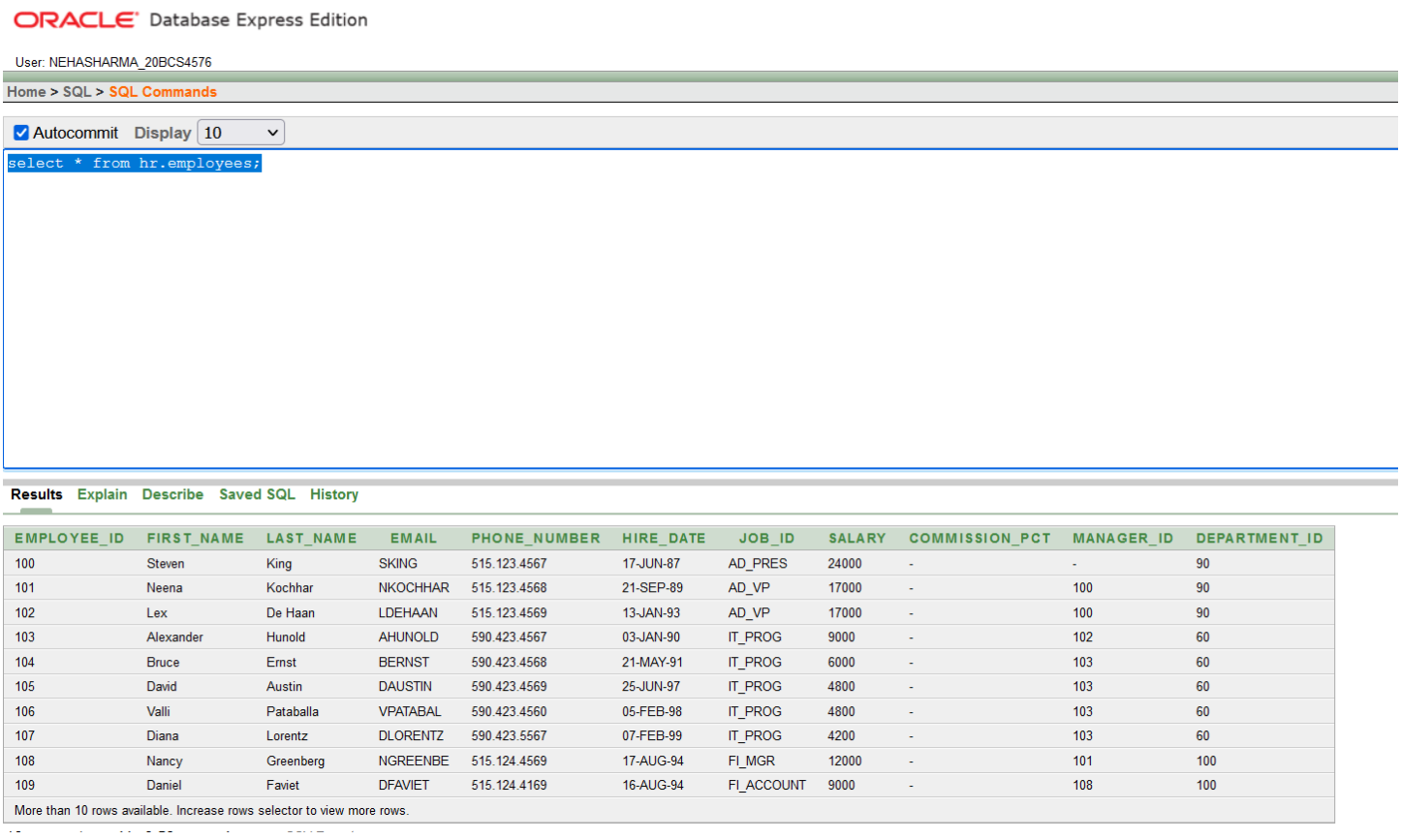
## 2.Viewing Data In The Tables

- **Syntax:**
- **`SELECT *|{[DISTINCT] column|expression [alias],...}`**
- **`FROM  table;`**
- **Purpose:** `SELECT` identifies the columns to be displayed.
  `FROM` identifies the table containing those columns

### Examples:
### (For example we will consider the default table job of HR user)

- **#Selecting all columns and rows**
- **SELECT * FROM table_name**

**OUTPUT**



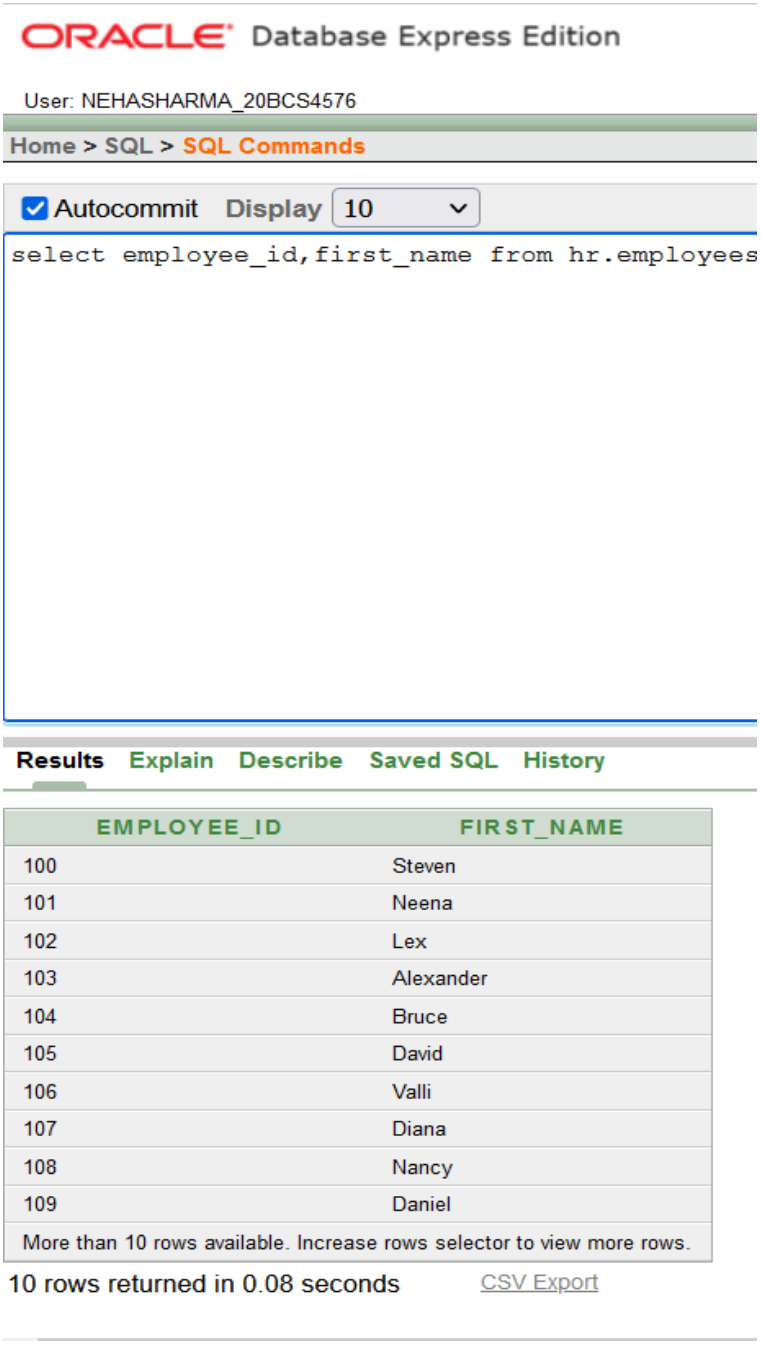

| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | Steven | King | SKING | 515.123.4567 | 17-JUN-87 | AD_PRES | 24000 | - | - | 90 |
| 101 | Neena | Kochhar | NKOCHHAR | 515.123.4568 | 21-SEP-89 | AD_VP | 17000 | - | 100 | 90 |
| 102 | Lex | De Haan | LDEHAAN | 515.123.4569 | 13-JAN-93 | AD_VP | 17000 | - | 100 | 90 |
| 103 | Alexander | Hunold | AHUNOLD | 590.423.4567 | 03-JAN-90 | IT_PROG | 9000 | - | 102 | 60 |
| 104 | Bruce | Ernst | BERNST | 590.423.4568 | 21-MAY-91 | IT_PROG | 6000 | - | 103 | 60 |
| 105 | David | Austin | DAUSTIN | 590.423.4569 | 25-JUN-97 | IT_PROG | 4800 | - | 103 | 60 |
| 106 | Valli | Pataballa | VPATABAL | 590.423.4560 | 05-FEB-98 | IT_PROG | 4800 | - | 103 | 60 |
| 107 | Diana | Lorentz | DLORENTZ | 590.423.5567 | 07-FEB-99 | IT_PROG | 4200 | - | 103 | 60 |
| 108 | Nancy | Greenberg | NGREENBE | 515.124.4569 | 17-AUG-94 | FI_MGR | 12000 | - | 101 | 100 |
| 109 | Daniel | Faviet | DFAVIET | 515.124.4169 | 16-AUG-94 | FI_ACCOUNT | 9000 | - | 108 | 100 |

More than 10 rows available. Increase rows selector to view more rows.

**# Selecting specific columns**

**SELECT col1, col2, col3 FROM table_name;**

**OUTPUT**




| EMPLOYEE_ID | FIRST_NAME |
|---|---|
| 100 | Steven |
| 101 | Neena |
| 102 | Lex |
| 103 | Alexander |
| 104 | Bruce |
| 105 | David |
| 106 | Valli |
| 107 | Diana |
| 108 | Nancy |
| 109 | Daniel |

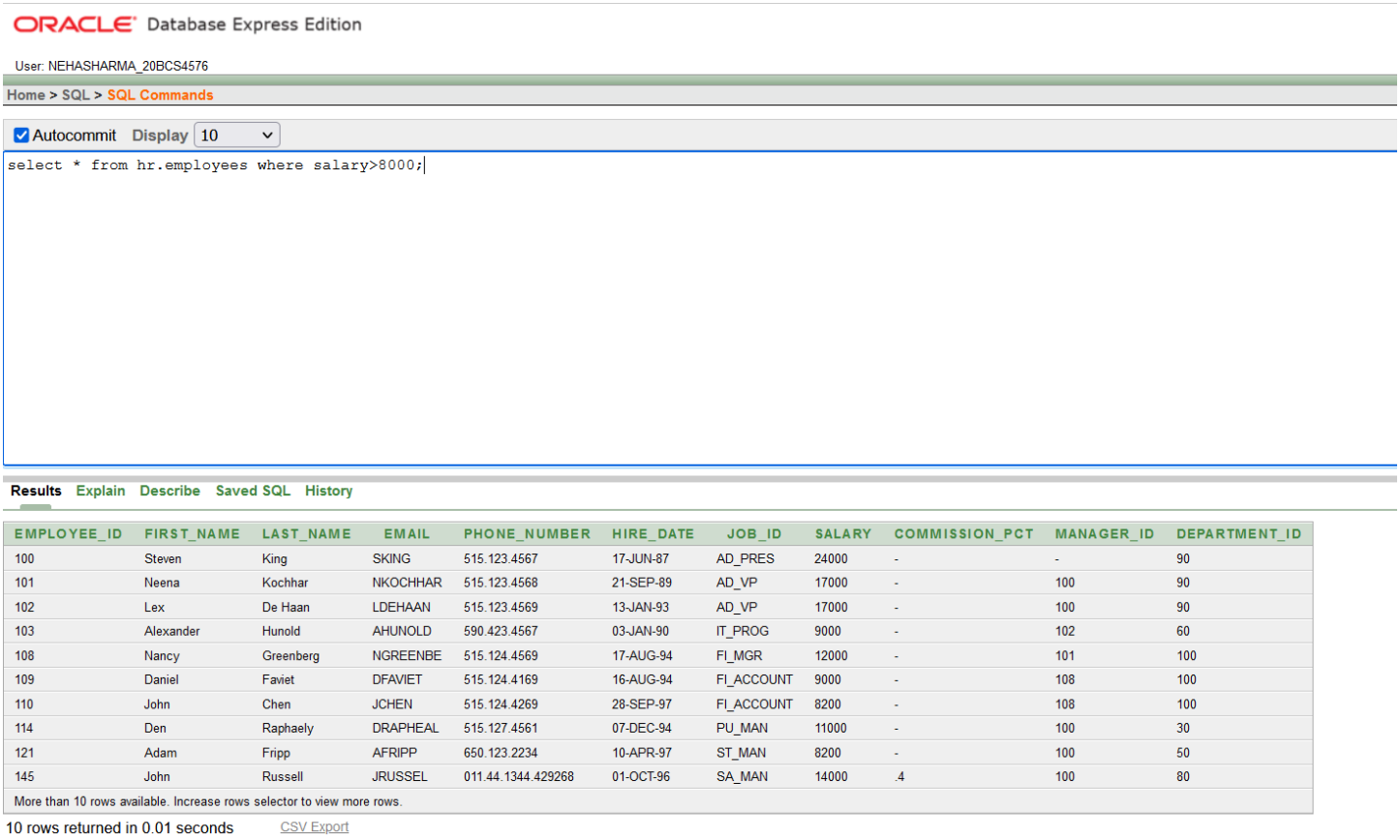
More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.08 seconds CSV Export

## # Selecting Specific rows:

- **The SQL WHERE clause is used to specify a condition while fetching the data.**
- **Syntax:** `SELECT *|{[DISTINCT] column|expression [alias],...}`
- `FROM table where..... condition;`

**OUTPUT**




| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | Steven | King | SKING | 515.123.4567 | 17-JUN-87 | AD_PRES | 24000 | - | - | 90 |
| 101 | Neena | Kochhar | NKOCHHAR | 515.123.4568 | 21-SEP-89 | AD_VP | 17000 | - | 100 | 90 |
| 102 | Lex | De Haan | LDEHAAN | 515.123.4569 | 13-JAN-93 | AD_VP | 17000 | - | 100 | 90 |
| 103 | Alexander | Hunold | AHUNOLD | 590.423.4567 | 03-JAN-90 | IT_PROG | 9000 | - | 102 | 60 |
| 108 | Nancy | Greenberg | NGREENBE | 515.124.4569 | 17-AUG-94 | FI_MGR | 12000 | - | 101 | 100 |
| 109 | Daniel | Faviet | DFAVIET | 515.124.4169 | 16-AUG-94 | FI_ACCOUNT | 9000 | - | 108 | 100 |
| 110 | John | Chen | JCHEN | 515.124.4269 | 28-SEP-97 | FI_ACCOUNT | 8200 | - | 108 | 100 |
| 114 | Den | Raphaely | DRAPHEAL | 515.127.4561 | 07-DEC-94 | PU_MAN | 11000 | - | 100 | 30 |
| 121 | Adam | Fripp | AFRIPP | 650.123.2234 | 10-APR-97 | ST_MAN | 8200 | - | 100 | 50 |
| 145 | John | Russell | JRUSSEL | 011.44.1344.429268 | 01-OCT-96 | SA_MAN | 14000 | .4 | 100 | 80 |

More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.01 seconds CSV Export

- **Distinct**
- **This clause is used to remove duplicate entry.**
- **Syntax: Select distinct column name from table_name**

**Example:**

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
select distinct department_id from hr.employees;
```

Results Explain Describe Saved SQL History

| DEPARTMENT_ID |
|---|
| 100 |
| 30 |
| - |
| 90 |
| 20 |
| 70 |
| 110 |
| 50 |
| 80 |
| 40 |
| More than 10 rows available. Increase rows selector to view more rows. |

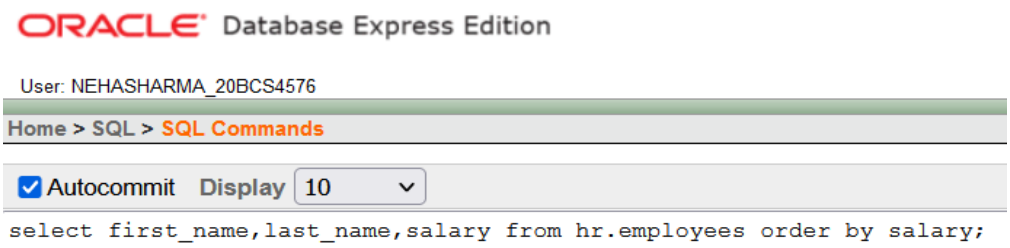
10 rows returned in 0.18 seconds CSV Export

**Order by**

**This clause is used to sort data in ascending/descending order.**

- **Syntax: Select colname from tablename Order by colname [asc|desc];**

**EXAMPLE:-**




Results Explain Describe Saved SQL History

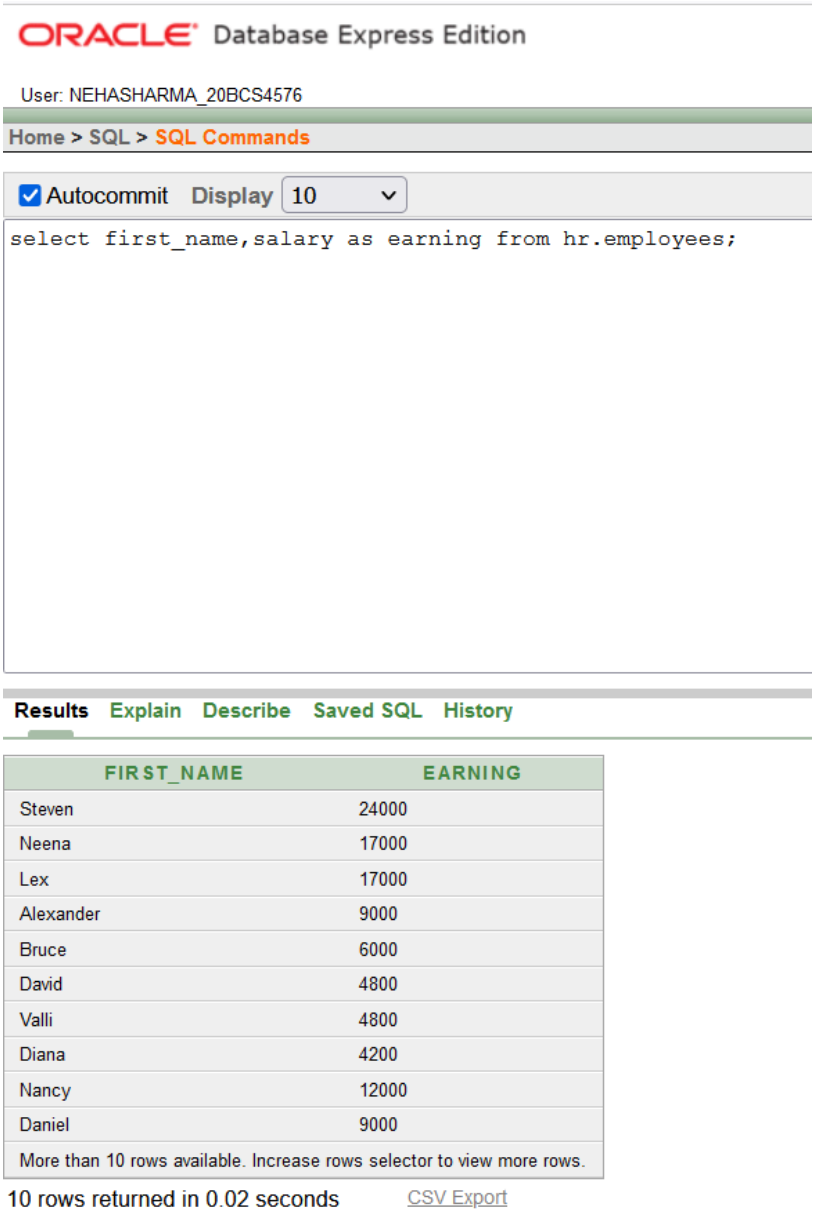
| FIRST_NAME | LAST_NAME | SALARY |
|---|---|---|
| TJ | Olson | 2100 |
| Steven | Markle | 2200 |
| Hazel | Philtanker | 2200 |
| James | Landry | 2400 |
| Ki | Gee | 2400 |
| Karen | Colmenares | 2500 |
| James | Marlow | 2500 |
| Joshua | Patel | 2500 |
| Peter | Vargas | 2500 |
| Martha | Sullivan | 2500 |
| More than 10 rows available. Increase rows selector to view more rows. | | |

10 rows returned in 0.00 seconds CSV Export

- **Using Alias**
- **SQL aliases are used to give a table, or a column in a table, a temporary name.**
- **Syntax:**

**SELECT column_name AS alias_name**
**FROM table_name;**

**EXAMPLE:-**




| FIRST_NAME | EARNING |
|---|---|
| Steven | 24000 |
| Neena | 17000 |
| Lex | 17000 |
| Alexander | 9000 |
| Bruce | 6000 |
| David | 4800 |
| Valli | 4800 |
| Diana | 4200 |
| Nancy | 12000 |
| Daniel | 9000 |
| More than 10 rows available. Increase rows selector to view more rows. | |

10 rows returned in 0.02 seconds CSV Export

# SQL Arithmetic operators (+,-*,/)

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

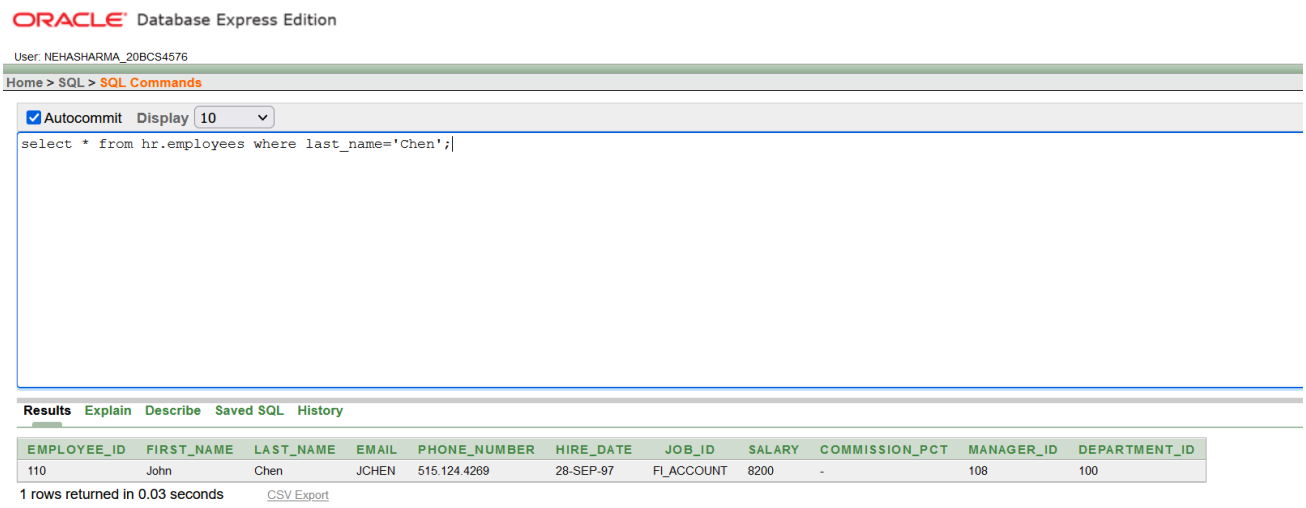
```
select first_name,salary+70 from hr.employees;
```

Results Explain Describe Saved SQL History

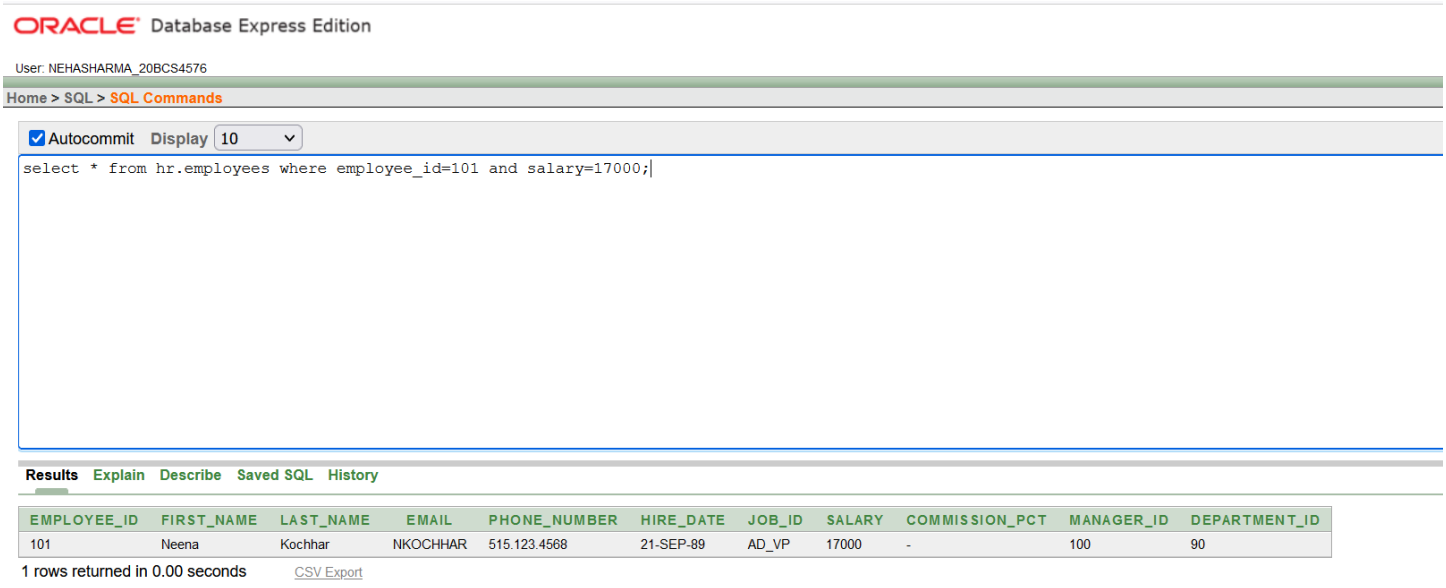
| FIRST_NAME | SALARY+70 |
|---|---|
| Steven | 24070 |
| Neena | 17070 |
| Lex | 17070 |
| Alexander | 9070 |
| Bruce | 6070 |
| David | 4870 |
| Valli | 4870 |
| Diana | 4270 |
| Nancy | 12070 |
| Daniel | 9070 |
| More than 10 rows available. Increase rows selector to view more rows. | |

10 rows returned in 0.03 seconds CSV Export

# SQL comparison(Relational) operators (<,>,<=,>=,<>)

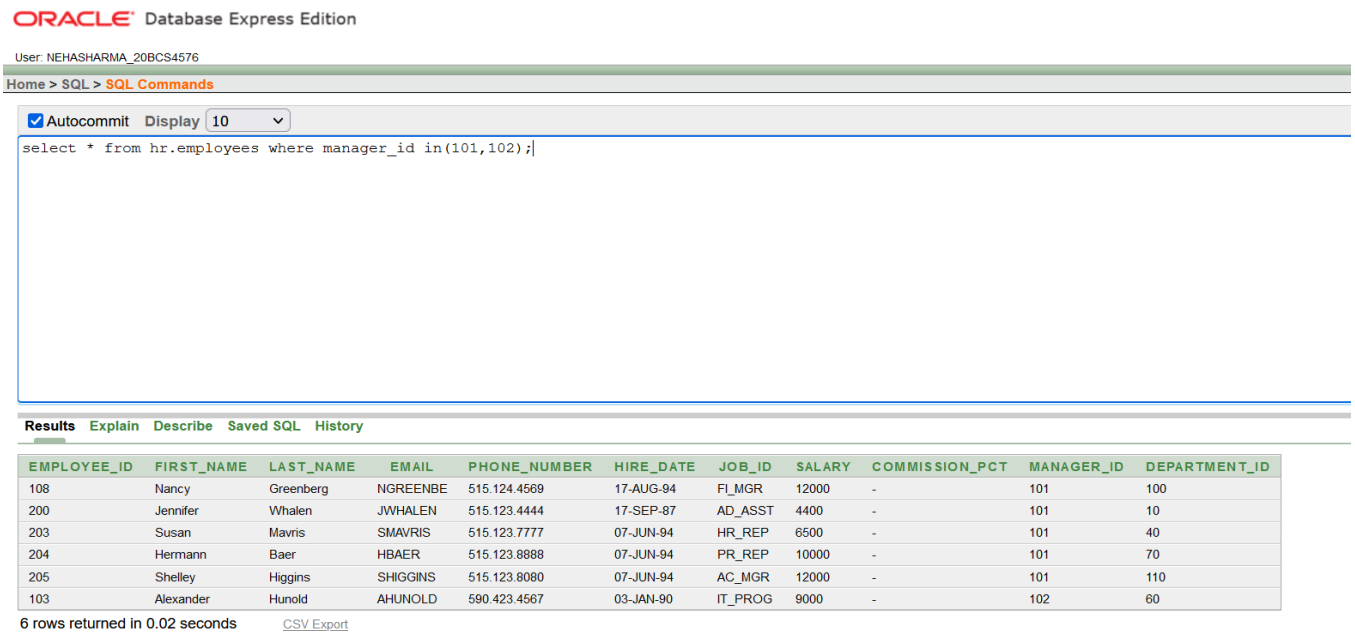



# SQL Logical operators (And, Or, Not):used for multiple condition



- **SQL Special Operators**
- **IN operator**

**It is used to specify a set of values and operation n is performed on all the values specified in the set and if any of the value that is present in the list matches with the values present in a table then it returns true and is operation is performed.**




| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 108 | Nancy | Greenberg | NGREENBE | 515.124.4569 | 17-AUG-94 | FI_MGR | 12000 | - | 101 | 100 |
| 200 | Jennifer | Whalen | JWHALEN | 515.123.4444 | 17-SEP-87 | AD_ASST | 4400 | - | 101 | 10 |
| 203 | Susan | Mavris | SMAVRIS | 515.123.7777 | 07-JUN-94 | HR_REP | 6500 | - | 101 | 40 |
| 204 | Hermann | Baer | HBAER | 515.123.8888 | 07-JUN-94 | PR_REP | 10000 | - | 101 | 70 |
| 205 | Shelley | Higgins | SHIGGINS | 515.123.8080 | 07-JUN-94 | AC_MGR | 12000 | - | 101 | 110 |
| 103 | Alexander | Hunold | AHUNOLD | 590.423.4567 | 03-JAN-90 | IT_PROG | 9000 | - | 102 | 60 |

6 rows returned in 0.02 seconds CSV Export

- **BETWEEN Operator**

**It is used to perform data comparison and manipulation over a range of values present in the database table.**

**EXAMPLE**

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
select * from hr.employees where salary between 5000 and 8000;
```

Results Explain Describe Saved SQL History

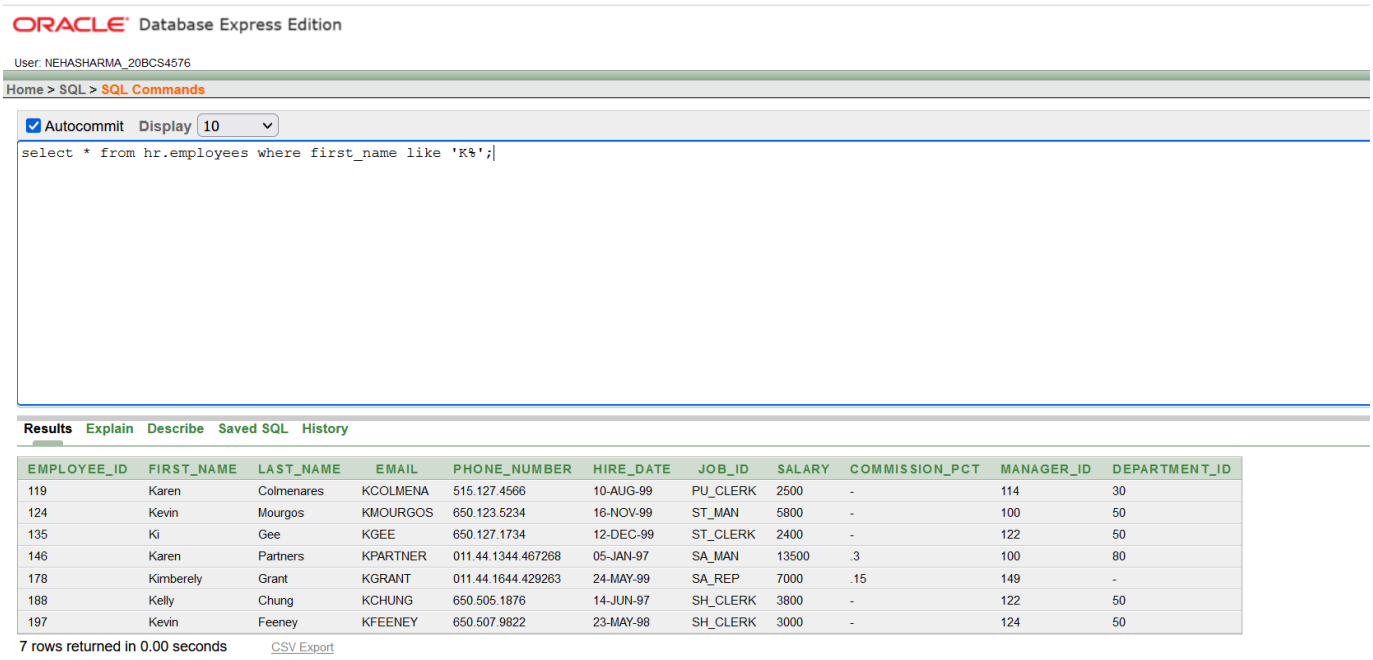
| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 104 | Bruce | Ernst | BERNST | 590.423.4568 | 21-MAY-91 | IT_PROG | 6000 | - | 103 | 60 |
| 111 | Ismael | Sciarra | ISCIARRA | 515.124.4369 | 30-SEP-97 | FI_ACCOUNT | 7700 | - | 108 | 100 |
| 112 | Jose Manuel | Urman | JMURMAN | 515.124.4469 | 07-MAR-98 | FI_ACCOUNT | 7800 | - | 108 | 100 |
| 113 | Luis | Popp | LPOPP | 515.124.4567 | 07-DEC-99 | FI_ACCOUNT | 6900 | - | 108 | 100 |
| 120 | Matthew | Weiss | MWEISS | 650.123.1234 | 18-JUL-96 | ST_MAN | 8000 | - | 100 | 50 |
| 122 | Payam | Kaufling | PKAUFLIN | 650.123.3234 | 01-MAY-95 | ST_MAN | 7900 | - | 100 | 50 |
| 123 | Shanta | Vollman | SVOLLMAN | 650.123.4234 | 10-OCT-97 | ST_MAN | 6500 | - | 100 | 50 |
| 124 | Kevin | Mourgos | KMOURGOS | 650.123.5234 | 16-NOV-99 | ST_MAN | 5800 | - | 100 | 50 |
| 153 | Christopher | Olsen | COLSEN | 011.44.1344.498718 | 30-MAR-98 | SA_REP | 8000 | .2 | 145 | 80 |
| 154 | Nanette | Cambrault | NCAMBRAU | 011.44.1344.987668 | 09-DEC-98 | SA_REP | 7500 | .2 | 145 | 80 |

More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.02 seconds CSV Export

- ## LIKE operator

**The like operator is a pattern matching operator and returns those records that match the specified pattern.**



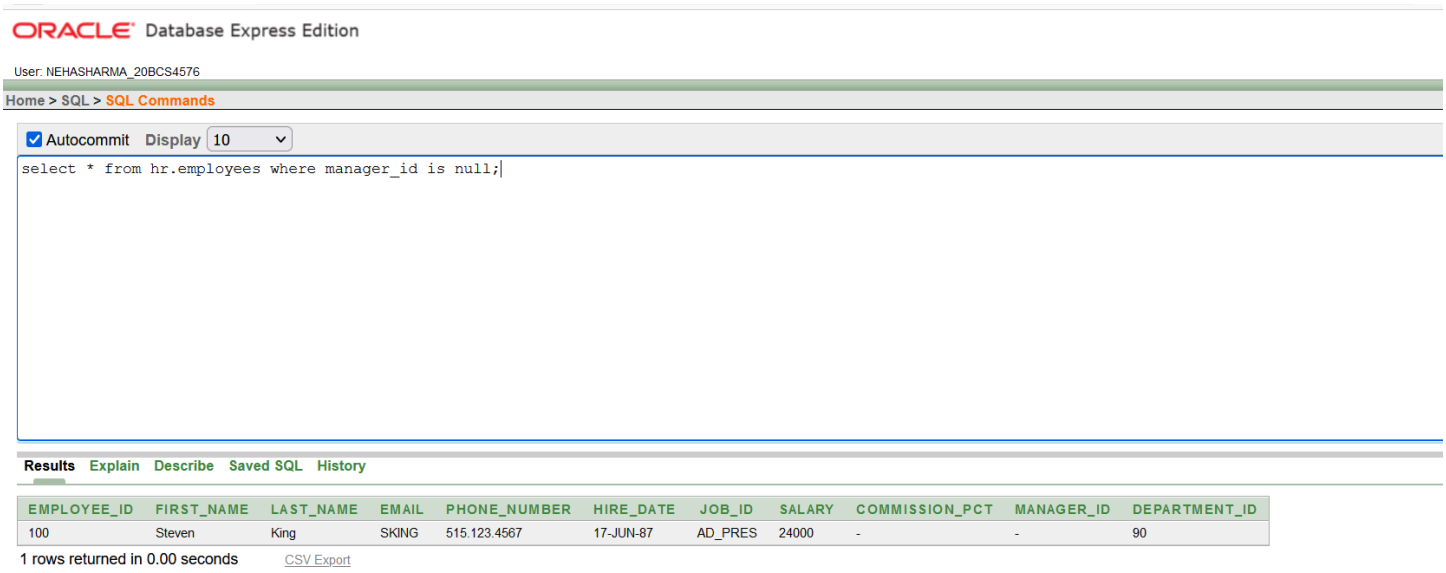

| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 119 | Karen | Colmenares | KCOLMENA | 515.127.4566 | 10-AUG-99 | PU_CLERK | 2500 | - | 114 | 30 |
| 124 | Kevin | Mourgos | KMOURGOS | 650.123.5234 | 16-NOV-99 | ST_MAN | 5800 | - | 100 | 50 |
| 135 | Ki | Gee | KGEE | 650.127.1734 | 12-DEC-99 | ST_CLERK | 2400 | - | 122 | 50 |
| 146 | Karen | Partners | KPARTNER | 011.44.1344.467268 | 05-JAN-97 | SA_MAN | 13500 | .3 | 100 | 80 |
| 178 | Kimberely | Grant | KGRANT | 011.44.1644.429263 | 24-MAY-99 | SA_REP | 7000 | .15 | 149 | - |
| 188 | Kelly | Chung | KCHUNG | 650.505.1876 | 14-JUN-97 | SH_CLERK | 3800 | - | 122 | 50 |
| 197 | Kevin | Feeney | KFEENEY | 650.507.9822 | 23-MAY-98 | SH_CLERK | 3000 | - | 124 | 50 |

7 rows returned in 0.00 seconds CSV Export

- ## IS NULL operator

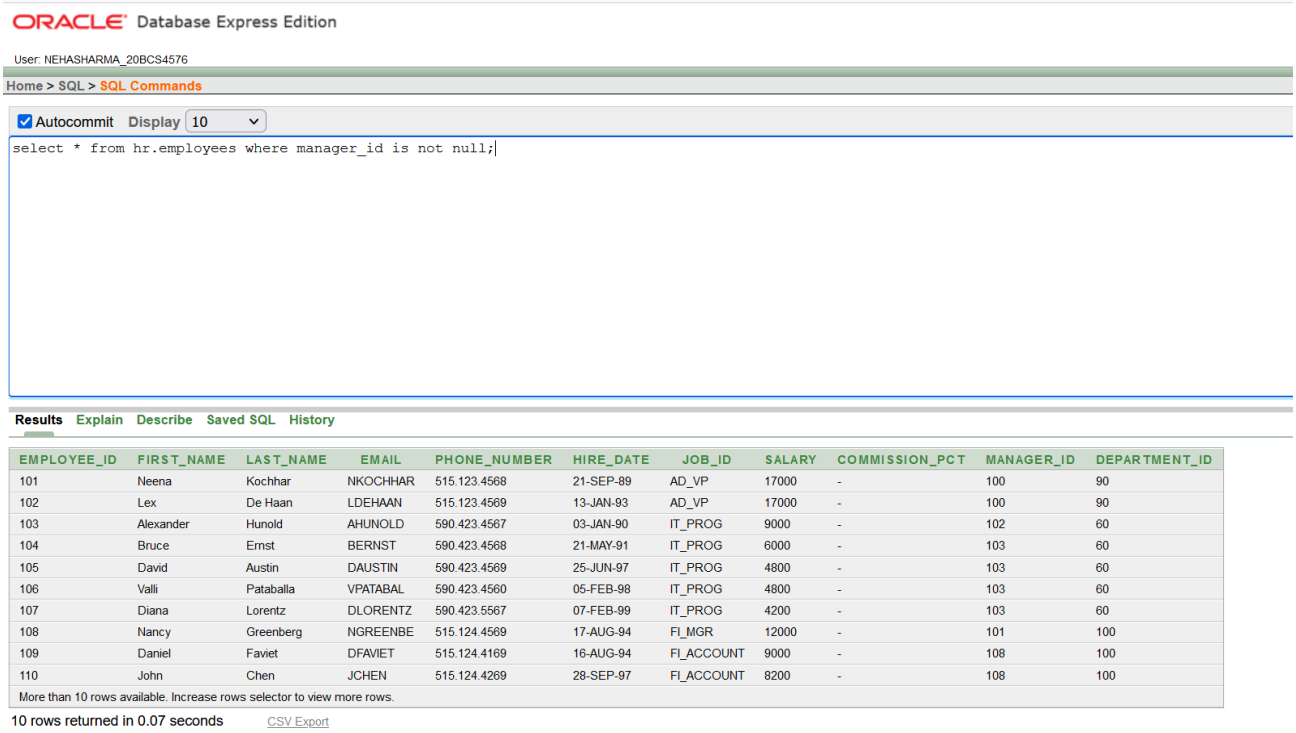
**All operations upon null values present in the table must be done using this ‘is null’ operator .we cannot compare null value using the assignment operator**

**Example:-**




- **NOT operator**
  **Not operator is a negation operator which is used along with like between, is null, in operators, It performs reverse r action of all these operators.**

## EXAMPLE:-



ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
select * from hr.employees where manager_id is not null;
```

Results Explain Describe Saved SQL History

| EMPLOYEE_ID | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER | HIRE_DATE | JOB_ID | SALARY | COMMISSION_PCT | MANAGER_ID | DEPARTMENT_ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 101 | Neena | Kochhar | NKOCHHAR | 515.123.4568 | 21-SEP-89 | AD_VP | 17000 | - | 100 | 90 |
| 102 | Lex | De Haan | LDEHAAN | 515.123.4569 | 13-JAN-93 | AD_VP | 17000 | - | 100 | 90 |
| 103 | Alexander | Hunold | AHUNOLD | 590.423.4567 | 03-JAN-90 | IT_PROG | 9000 | - | 102 | 60 |
| 104 | Bruce | Ernst | BERNST | 590.423.4568 | 21-MAY-91 | IT_PROG | 6000 | - | 103 | 60 |
| 105 | David | Austin | DAUSTIN | 590.423.4569 | 25-JUN-97 | IT_PROG | 4800 | - | 103 | 60 |
| 106 | Valli | Pataballa | VPATABAL | 590.423.4560 | 05-FEB-98 | IT_PROG | 4800 | - | 103 | 60 |
| 107 | Diana | Lorentz | DLORENTZ | 590.423.5567 | 07-FEB-99 | IT_PROG | 4200 | - | 103 | 60 |
| 108 | Nancy | Greenberg | NGREENBE | 515.124.4569 | 17-AUG-94 | FI_MGR | 12000 | - | 101 | 100 |
| 109 | Daniel | Faviet | DFAVIET | 515.124.4169 | 16-AUG-94 | FI_ACCOUNT | 9000 | - | 108 | 100 |
| 110 | John | Chen | JCHEN | 515.124.4269 | 28-SEP-97 | FI_ACCOUNT | 8200 | - | 108 | 100 |

More than 10 rows available. Increase rows selector to view more rows.

10 rows returned in 0.07 seconds CSV Export

- **DROP table command**
- **Purpose: It is used to delete table with structure**
- **Syntax: DROP TABLE <table name>;**

- **EXAMPLE**

ORACLE Database Express Edition

User: NEHASHARMA_20BCS4576

Home > SQL > SQL Commands

Autocommit Display 10

```
drop table program;
```

Results Explain Describe Saved SQL History

```
Table dropped.
```

0.82 seconds

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

**5. Result/Output/Writing Summary:- NA**

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

**Learning outcomes (What I have learnt):**

1. **Understood the database concepts and database management system software .**
2. **Oracle**
3. **To learn basic commands of SQL.**
4. **To learn how to write SQL commands to create tables.**
5. **Understood the major DBMS components and their function.**

**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. | | | |
| | | | |