

Experiment-8: To implement the concept of subquery

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Branch: CSE-IOT

Section/Group: A

Semester: 3

Date of Performance: Nov 18,2021

Subject Name: DBMS LAB

Subject Code: 20CSP-233

1. Aim/Overview of the practical:

To implement the concept of subquery.

2. Task to be done:

Implementation of Subquery commands of SQL with proper Input queries syntax and the output.

3. Theme/Interests definition(For creative domains):

SUBQUERIES: A subquery is a form of an SQL statement that appears inside another SQL statement. It is also termed as nested subquery. The statement containing a subquery is called a parent statement. The parent statement uses the rows (i.e., the result set) returned by the subquery.

It can be used for the following:

To insert records in a target table

To create tables and insert records in the table

created To update records in a target table

To create views

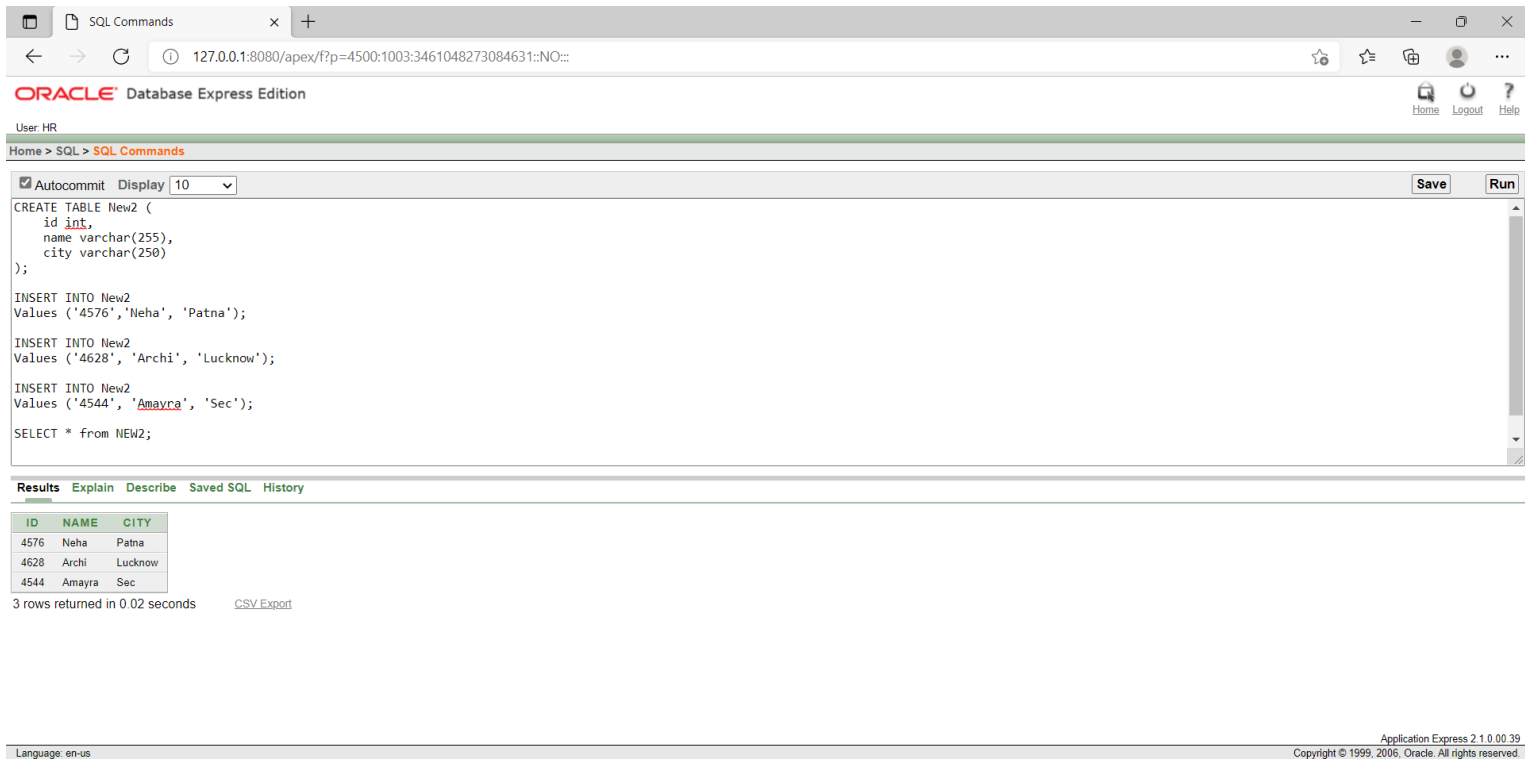
To provide values for conditions in WHERE, HAVING, IN and so on used with SELECT, UPDATE and DELETE statements.

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

1. View Data In The Tables:

Example: - SELECT * FROM STUDENT101;

OUTPUT:



The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the following code:

```
CREATE TABLE New2 (  
  id int,  
  name varchar(255),  
  city varchar(250)  
);  
  
INSERT INTO New2  
Values ('4576', 'Neha', 'Patna');  
  
INSERT INTO New2  
Values ('4628', 'Archi', 'Lucknow');  
  
INSERT INTO New2  
Values ('4544', 'Amayra', 'Sec');  
  
SELECT * from NEW2;
```

The Results window shows the output of the SELECT statement:

ID	NAME	CITY
4576	Neha	Patna
4628	Archi	Lucknow
4544	Amayra	Sec

3 rows returned in 0.02 seconds [CSV Export](#)

Application Express 2.1.0.00.39
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☒ Autocommit Display

Save **Run**

Select * from NEW1;



Results [Explain](#) [Describe](#) [Saved SQL](#) [History](#)

ID	NAME
4501	Ruthvik
4505	Shivansh
4548	Ajay
4570	Suyash
4525	Saksham
4522	Anandu
4570	Jelly Pavan Kumar
4500	Style

8 rows returned in 0.00 seconds [CSV Export](#)

2. Using Sub-query In The FROM Clause:-

Command: - SELECT

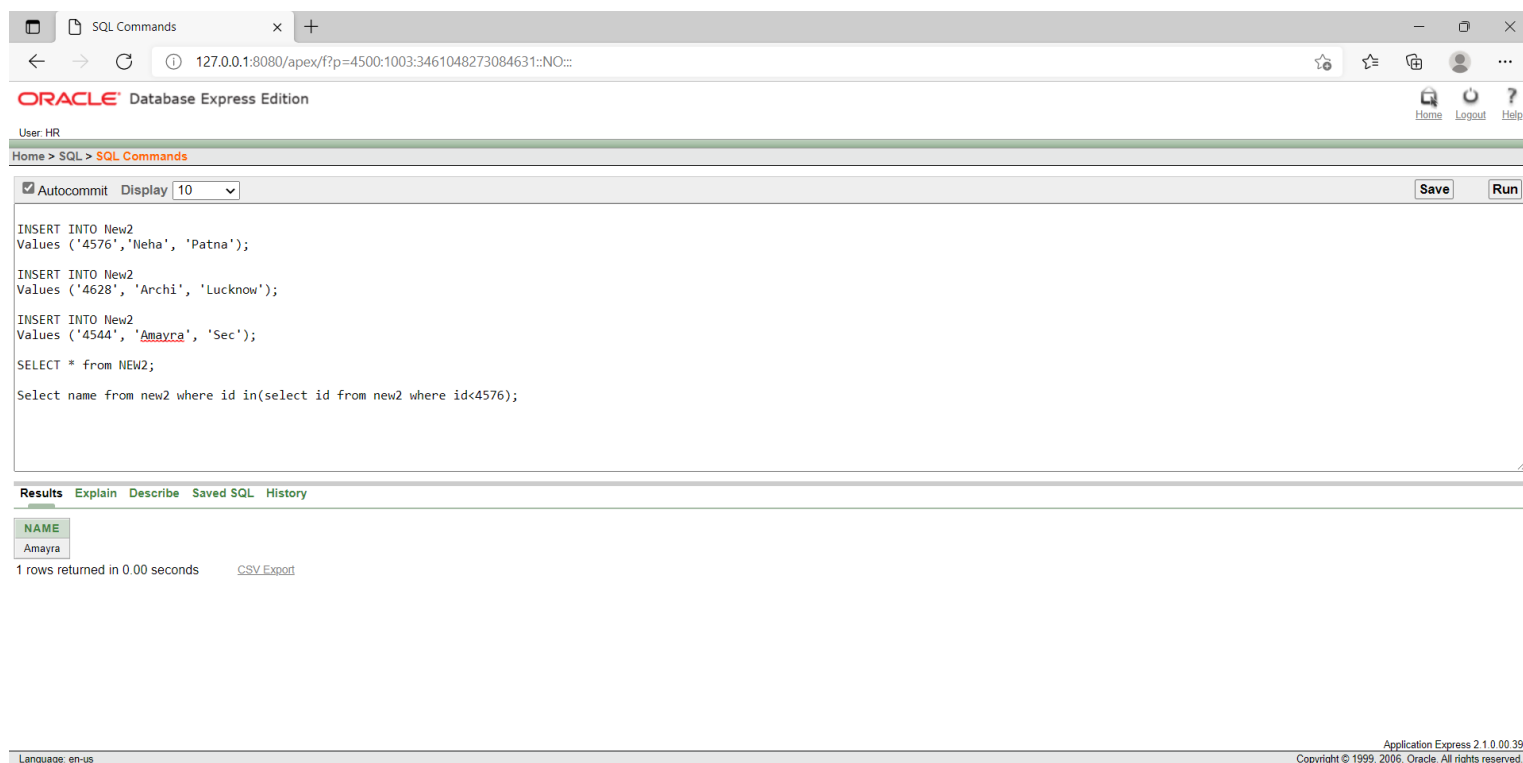
Example: Select name from student101 where id IN(select id from dept101 where age>20);

3. Using Sub-query In The WHERE Clause:-

Command: - SELECT

Example: Select name from student101 where id IN(select id from dept101 where age<20);

Output:



The screenshot shows the Oracle Database Express Edition SQL Command window. The SQL command entered is:

```

INSERT INTO New2
Values ('4576','Neha', 'Patna');

INSERT INTO New2
Values ('4628', 'Archi', 'Lucknow');

INSERT INTO New2
Values ('4544', 'Amayra', 'Sec');

SELECT * from NEW2;

Select name from new2 where id in(select id from new2 where id<4576);
  
```

The command is executed, and the output shows one row returned: 'Amayra'. The status bar at the bottom indicates '1 rows returned in 0.00 seconds'.



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SQL Commands

127.0.0.1:8080/apex/?p=4500:1003:3461048273084631::NO::

ORACLE Database Express Edition

User: HR

Home > SQL > SQL Commands

☒ Autocommit

Display 10

Save

Run

```
CREATE TABLE New2 (  
  id int,  
  name varchar(255),  
  city varchar(250)  
);  
  
INSERT INTO New2  
Values ('4576', 'Neha', 'Patna');  
  
INSERT INTO New2  
Values ('4628', 'Archi', 'Lucknow');  
  
INSERT INTO New2  
Values ('4544', 'Amayra', 'Sec');  
  
SELECT * from NEW2;
```

Results

Explain

Describe

Saved SQL

History

ID	NAME	CITY
4576	Neha	Patna
4628	Archi	Lucknow
4544	Amayra	Sec

3 rows returned in 0.02 seconds

CSV Export

Language: en-us

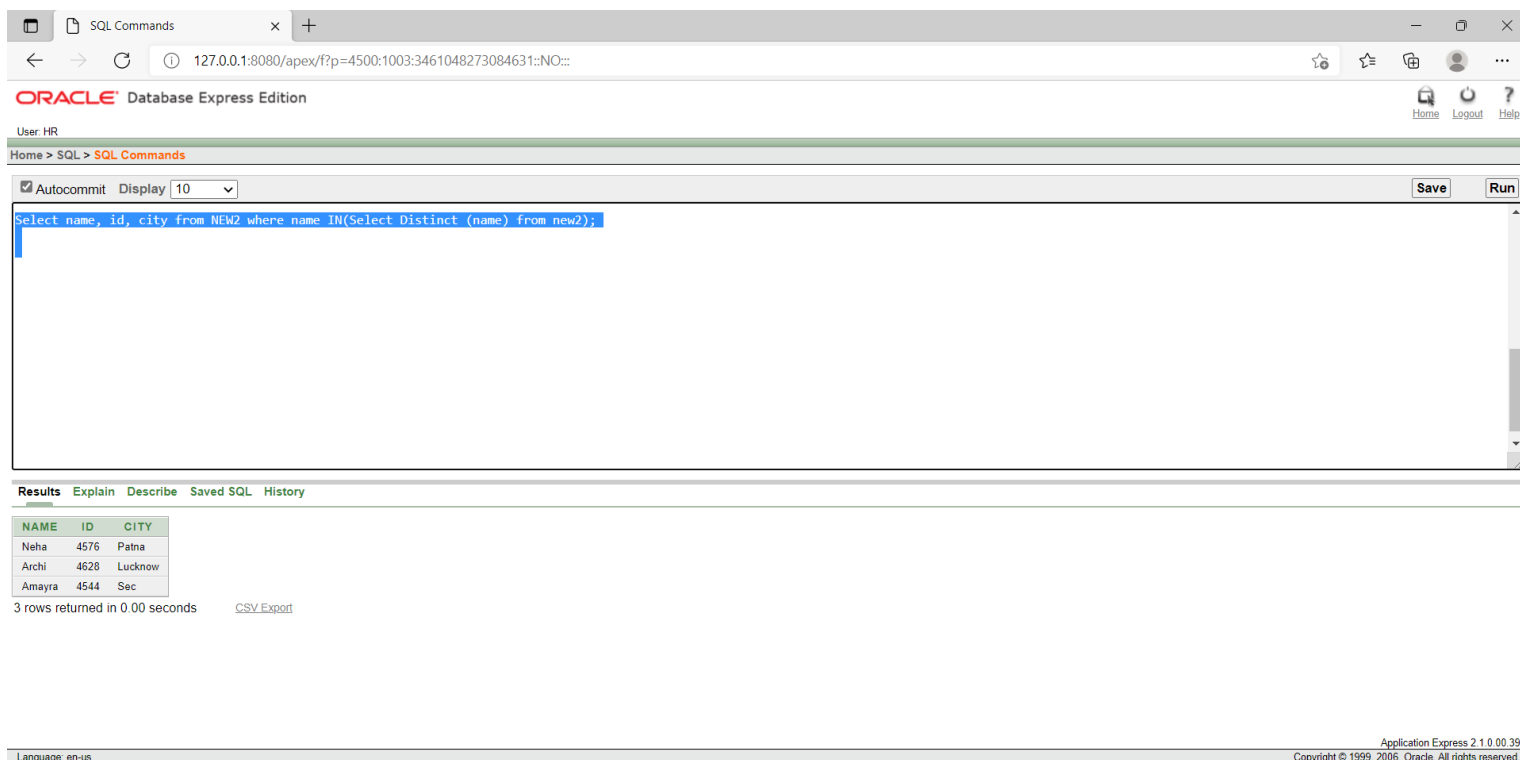
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4. Nested Sub-Query

1. IN

Example: Select name, age, branch FROM dept101 WHERE name IN(SELECT DISTINCT(name) FROM student101);

Output:-



The screenshot shows the Oracle Database Express Edition interface. The SQL command entered is: `Select name, id, city from NEW2 where name IN(Select Distinct (name) from new2);`. The results are displayed in a table with 3 rows.

NAME	ID	CITY
Neha	4576	Patna
Archi	4628	Lucknow
Amayra	4544	Sec

3 rows returned in 0.00 seconds [CSV Export](#)

2. NOT IN

Example: Select LAST_NAME, FIRST_NAME, JOB_ID FROM
HR.EMPLOYEES WHERE DEPARTMENT_ID NOT IN
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE
DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM
HR.EMPLOYEES);

Output:-

The screenshot shows the Oracle Database Express Edition interface. The SQL command entered is: `Select LAST_NAME, FIRST_NAME, JOB_ID FROM HR.EMPLOYEES WHERE DEPARTMENT_ID NOT IN (SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);`. The results are displayed in a table with 10 rows and 3 columns: LAST_NAME, FIRST_NAME, and JOB_ID.

LAST_NAME	FIRST_NAME	JOB_ID
King	Steven	AD_PRES
Kochhar	Neena	AD_VP
De Haan	Lex	AD_VP
Greenberg	Nancy	FI_MGR
Faviet	Daniel	FI_ACCOUNT
Chen	John	FI_ACCOUNT
Sciarra	Ismael	FI_ACCOUNT
Urman	Jose Manuel	FI_ACCOUNT
Popp	Luis	FI_ACCOUNT
Raphaely	Den	PU_MAN

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 1.42 seconds [CSV Export](#)

3. ANY

Example:

Select LAST_NAME, FIRST_NAME, JOB_ID FROM
HR.EMPLOYEES WHERE DEPARTMENT_ID = ANY
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME

LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);

Output:

The screenshot shows the Oracle Database Express Edition interface. The SQL Command window contains the following query:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM HR.EMPLOYEES WHERE DEPARTMENT_ID = ANY  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

The query has been executed, and the results are displayed in a table with the following columns: LAST_NAME, FIRST_NAME, and JOB_ID. The results show one row: Hunold, Alexander, IT_PROG.

LAST_NAME	FIRST_NAME	JOB_ID
Hunold	Alexander	IT_PROG

1 rows returned in 0.00 seconds

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The screenshot shows the Windows taskbar. On the left is the Start button and a search bar with the text "Type here to search". In the center are task view and several application icons (Spotify, Google Chrome, File Explorer, Microsoft Edge). On the right is the system tray showing the date and time (23:48, 18-11-2021) and a notification icon.

4. SOME

Example:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM  
HR.EMPLOYEES WHERE DEPARTMENT_ID = SOME  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME  
LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

Output:

The screenshot shows the Oracle Database Express Edition interface. The SQL command window contains the following query:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM HR.EMPLOYEES WHERE DEPARTMENT_ID = SOME  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

The query has been executed, and the results are displayed in the Results tab. The results show one row of data:

LAST_NAME	FIRST_NAME	JOB_ID
Hunold	Alexander	IT_PROG

1 rows returned in 0.00 seconds

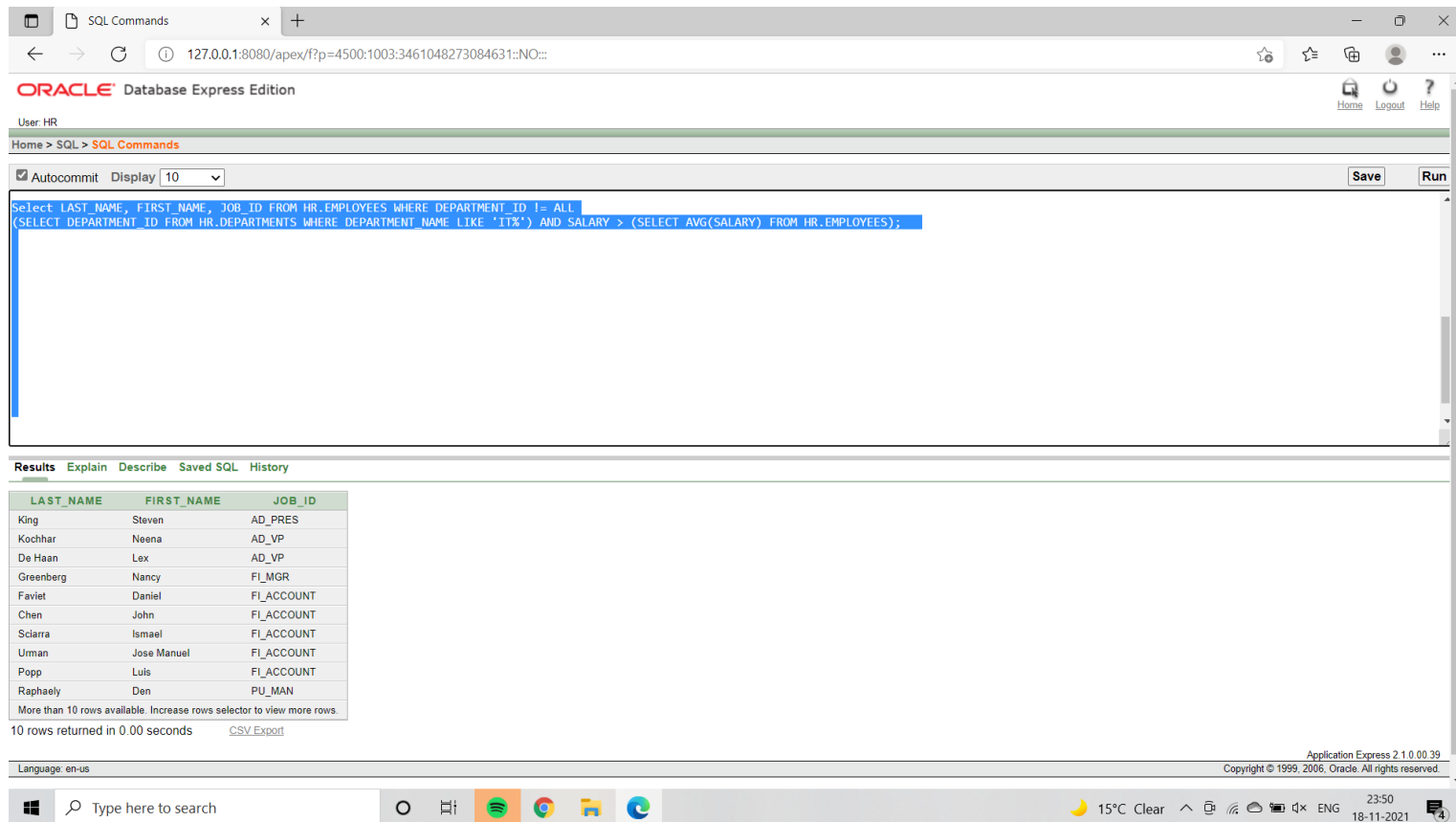
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4. NOT EQUAL ALL (! = ALL)

Example:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM  
HR.EMPLOYEES WHERE DEPARTMENT_ID != ALL  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME  
LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

Output:



The screenshot shows the Oracle Database Express Edition interface. The SQL command window contains the following query:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM HR.EMPLOYEES WHERE DEPARTMENT_ID != ALL  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

The query has been executed, and the results are displayed in a table with 10 rows. The table has three columns: LAST_NAME, FIRST_NAME, and JOB_ID. The results are as follows:

LAST_NAME	FIRST_NAME	JOB_ID
King	Steven	AD_PRES
Kochhar	Neena	AD_VP
De Haan	Lex	AD_VP
Greenberg	Nancy	FI_MGR
Faviet	Daniel	FI_ACCOUNT
Chen	John	FI_ACCOUNT
Sclarra	Ismael	FI_ACCOUNT
Urman	Jose Manuel	FI_ACCOUNT
Popp	Luis	FI_ACCOUNT
Raphaely	Den	PU_MAN

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.00 seconds [CSV Export](#)

6.(<= ALL) LESS THAN EQUAL TO ALL

Example:

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM  
HR.EMPLOYEES WHERE DEPARTMENT_ID <= ALL  
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME  
LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

Output:

SQL Commands x + 127.0.0.1:8080/apex/?p=4500:1003:3461048273084631:NO::

ORACLE Database Express Edition

User: HR

Home > SQL > SQL Commands

Autocommit Display 10 Save Run

```
Select LAST_NAME, FIRST_NAME, JOB_ID FROM HR.EMPLOYEES WHERE DEPARTMENT_ID <= ALL
(SELECT DEPARTMENT_ID FROM HR.DEPARTMENTS WHERE DEPARTMENT_NAME LIKE 'IT%') AND SALARY > (SELECT AVG(SALARY) FROM HR.EMPLOYEES);
```

Results Explain Describe Saved SQL History

LAST_NAME	FIRST_NAME	JOB_ID
Hunold	Alexander	IT_PROG
Raphaely	Den	PU_MAN
Weiss	Matthew	ST_MAN
Fripp	Adam	ST_MAN
Kauffman	Payam	ST_MAN
Vollman	Shanta	ST_MAN
Hartstein	Michael	MK_MAN
Mavris	Susan	HR_REP

8 rows returned in 0.03 seconds CSV Export

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Language: en-us

Windows taskbar with search bar, task icons, system tray (15°C Clear, 23:50, 18-11-2021).

5. Single-Row Subqueries

Example:

SELECT name, branch, rollno FROM student101 WHERE id > (SELECT id from dept101 WHERE name = 'A');

Output:

SQL Commands x + 127.0.0.1:8080/apex/?p=4500:1003:3461048273084631:NO::

ORACLE Database Express Edition

User: HR

Home > SQL > SQL Commands

Autocommit Display 10 Save Run

```
SELECT name, id FROM ntw2 WHERE id > (SELECT id from ntw2 WHERE name = 'Nctia');
```

Results Explain Describe Saved SQL History

NAME	ID
Arch	4628

1 rows returned in 0.05 seconds CSV Export

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Language: en-us

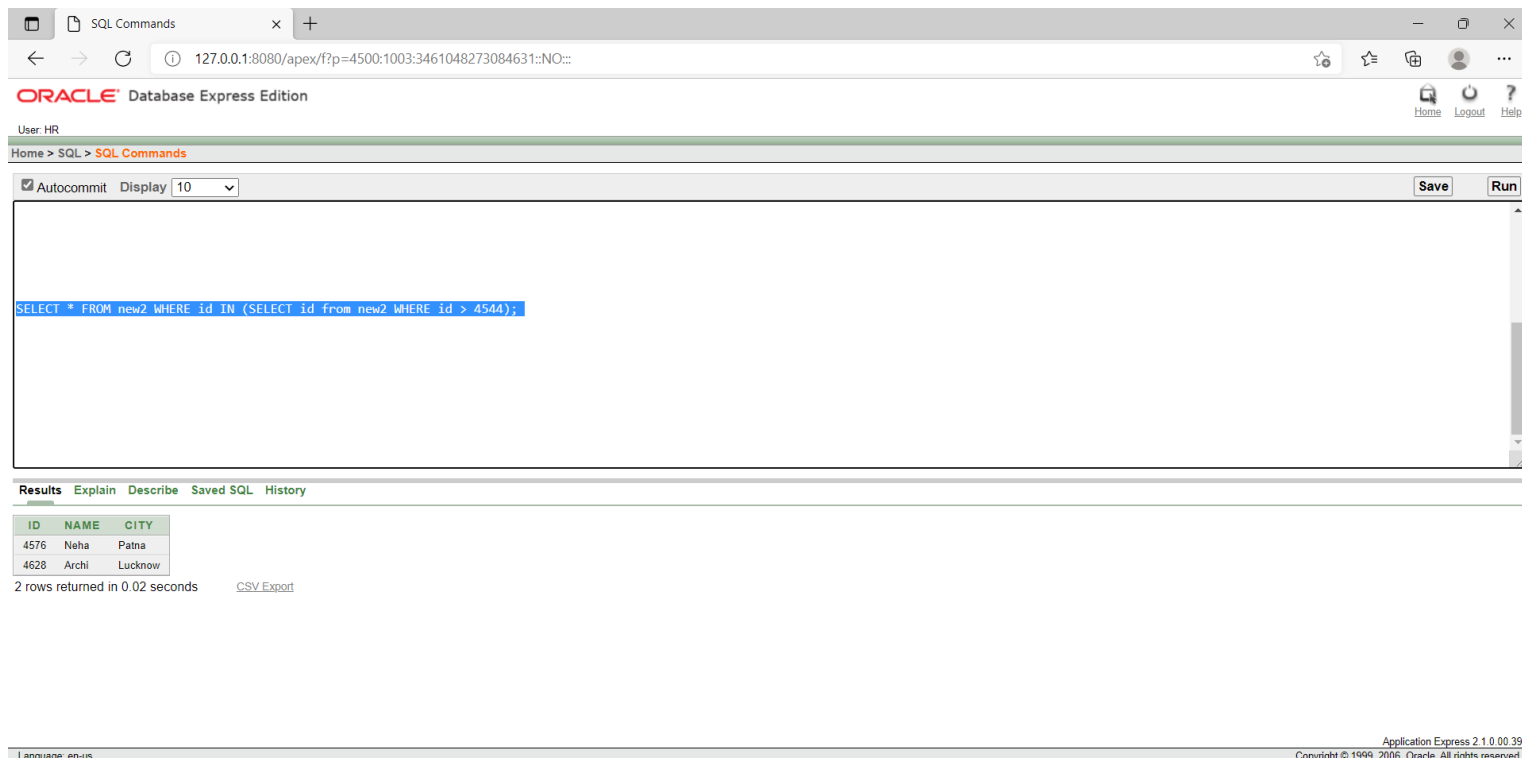
Windows taskbar with search bar, task icons, system tray (15°C Clear, 23:53, 18-11-2021).

6. Multiple row subquery

Example:

SELECT * FROM student101 WHERE id IN (SELECT id FROM dept101 Where id > 5);

Output:



The screenshot shows the Oracle Database Express Edition interface. The SQL command window contains the query: `SELECT * FROM new2 WHERE id IN (SELECT id from new2 WHERE id > 4544);`. The results window displays a table with 2 rows:

ID	NAME	CITY
4576	Neha	Patna
4628	Archi	Lucknow

2 rows returned in 0.02 seconds. The interface also shows the 'Autocommit' checkbox checked and the 'Display' dropdown set to 10.

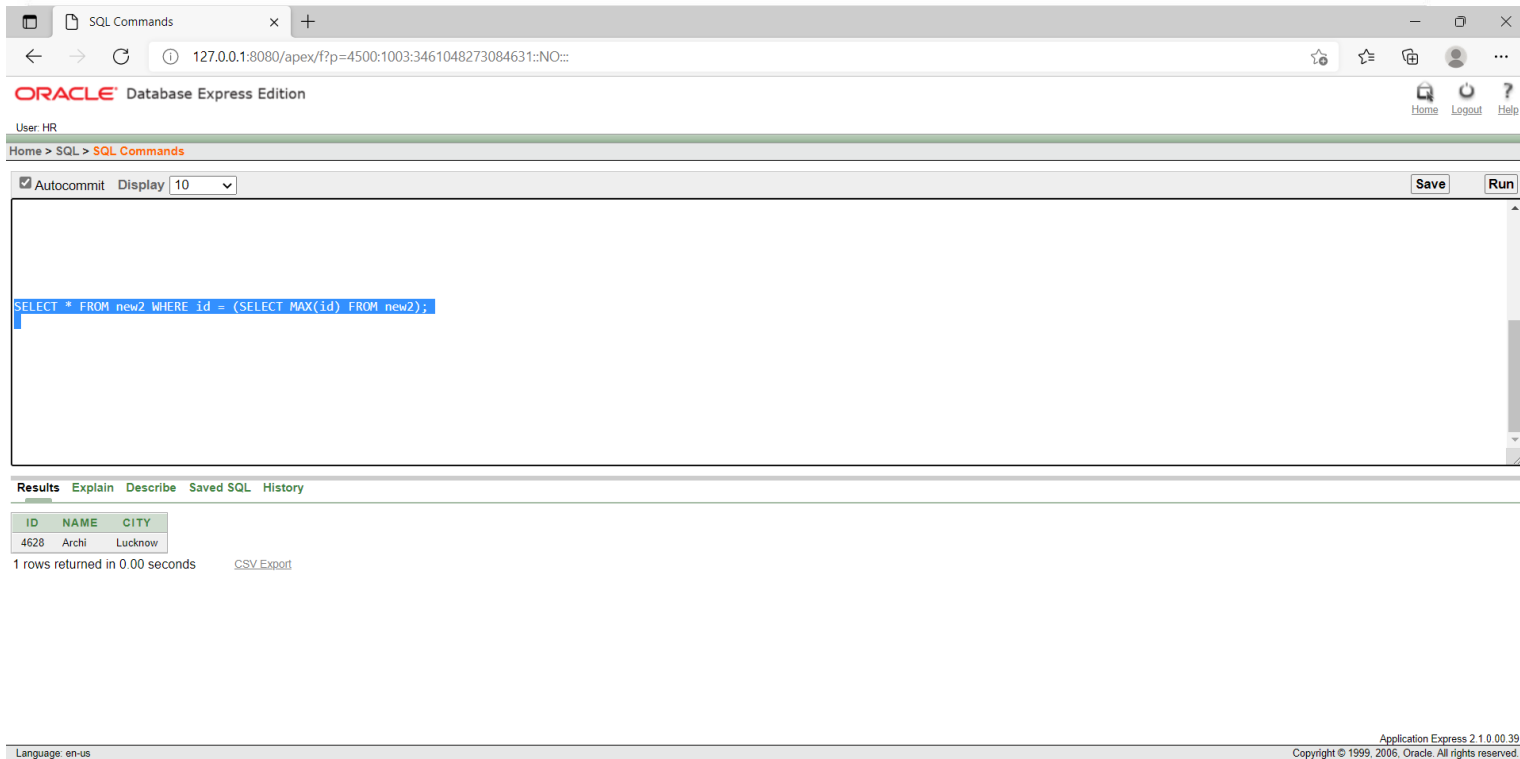
7. Group Functions in a Subquery

max()

Example:

SELECT * FROM student101 WHERE id = (SELECT MAX(id) FROM student101);

Output:



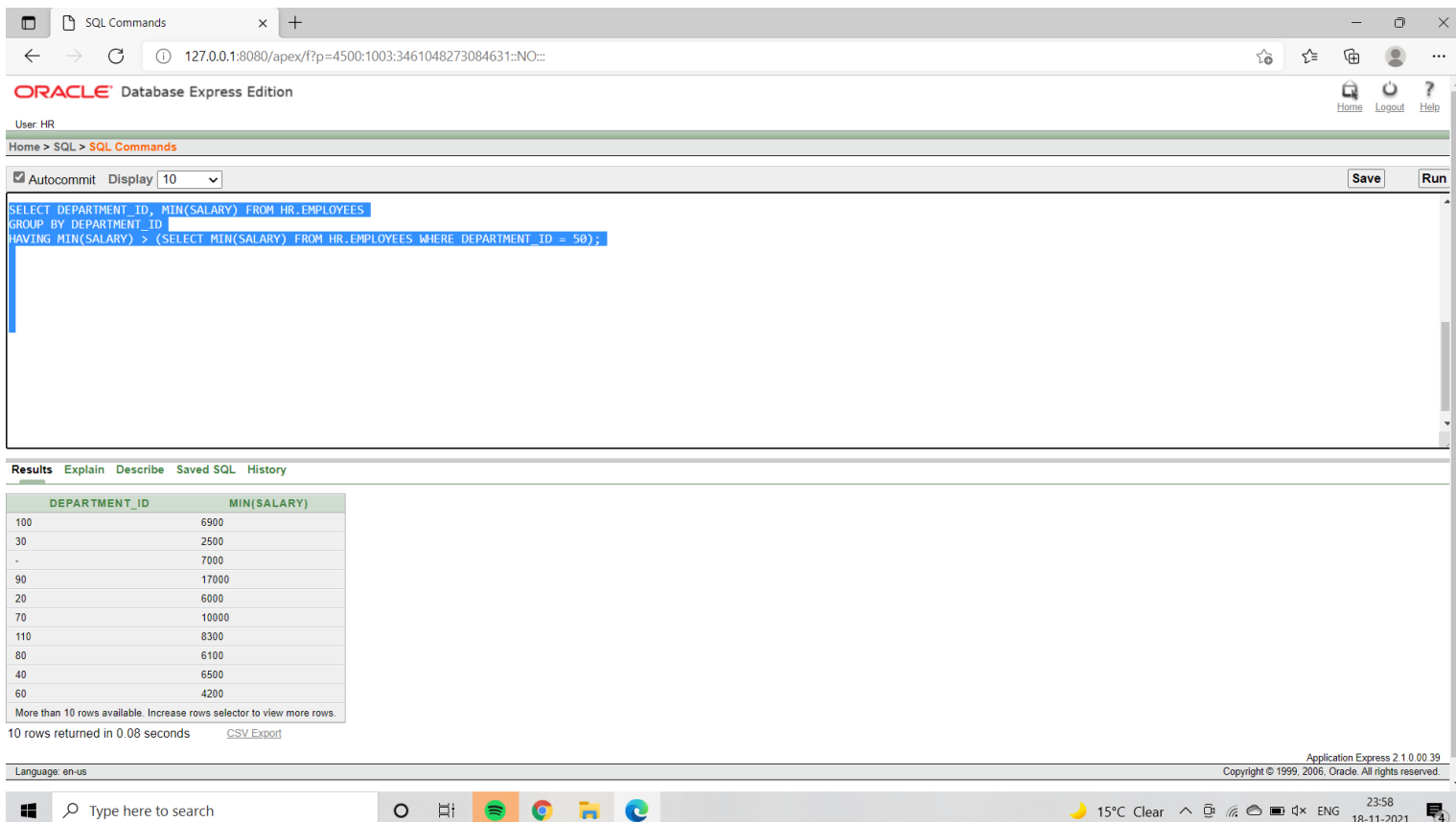
The screenshot shows the Oracle Database Express Edition web interface. The browser address bar displays the URL: 127.0.0.1:8080/apex/f?p=4500:1003:3461048273084631::NO::. The page title is "ORACLE Database Express Edition". The user is logged in as "HR". The "SQL Commands" tab is active, showing a query: `SELECT * FROM new2 WHERE id = (SELECT MAX(id) FROM new2);`. The "Autocommit" checkbox is checked, and the "Display" dropdown is set to 10. The "Save" and "Run" buttons are visible. Below the query editor, the "Results" tab is selected, showing a table with columns "ID", "NAME", and "CITY". The table contains one row: ID 4628, NAME Archi, CITY Lucknow. The status bar at the bottom indicates "1 rows returned in 0.00 seconds" and provides a "CSV Export" link. The footer shows "Application Express 2.1.0.00.39" and "Copyright © 1999, 2006, Oracle. All rights reserved."

8. The HAVING Clause with Subqueries

Example:

```
SELECT DEPARTMENT_ID,  
MIN(SALARY) FROM  
HR.EMPLOYEES  
GROUP BY DEPARTMENT_ID  
HAVING MIN(SALARY) > (SELECT MIN(SALARY) FROM HR.EMPLOYEES WHERE DEPARTMENT_ID =  
50);
```

Output:



The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the following query:

```
SELECT DEPARTMENT_ID, MIN(SALARY) FROM HR.EMPLOYEES
GROUP BY DEPARTMENT_ID
HAVING MIN(SALARY) > (SELECT MIN(SALARY) FROM HR.EMPLOYEES WHERE DEPARTMENT_ID = 50);
```

The Results window displays the following data:

DEPARTMENT_ID	MIN(SALARY)
100	6900
30	2500
-	7000
90	17000
20	6000
70	10000
110	8300
80	6100
40	6500
60	4200

More than 10 rows available. Increase rows selector to view more rows.
10 rows returned in 0.08 seconds [CSV Export](#)

Learning outcomes (What I have learnt):

1. Learned about different SQL commands.
2. Learned about the implementation of the concept of subquery with single row, multiple row and group by functions.

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.			



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