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# DBMS LABORATORY WITH MINI PROJECT

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2017-2018)

## SEMESTER – V

Subject Code: **17CSL58**

IA Marks: **40**

Exam Marks: **60**

Exam Hours: **03**

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### Program - 5

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Consider the schema for Company Database:

**EMPLOYEE(SSN, Name, Address, Sex, Salary, SuperSSN, DNo)**

**DEPARTMENT(DNo, DName, MgrSSN, MgrStartDate)**

**DLOCATION(DNo, DLoc)**

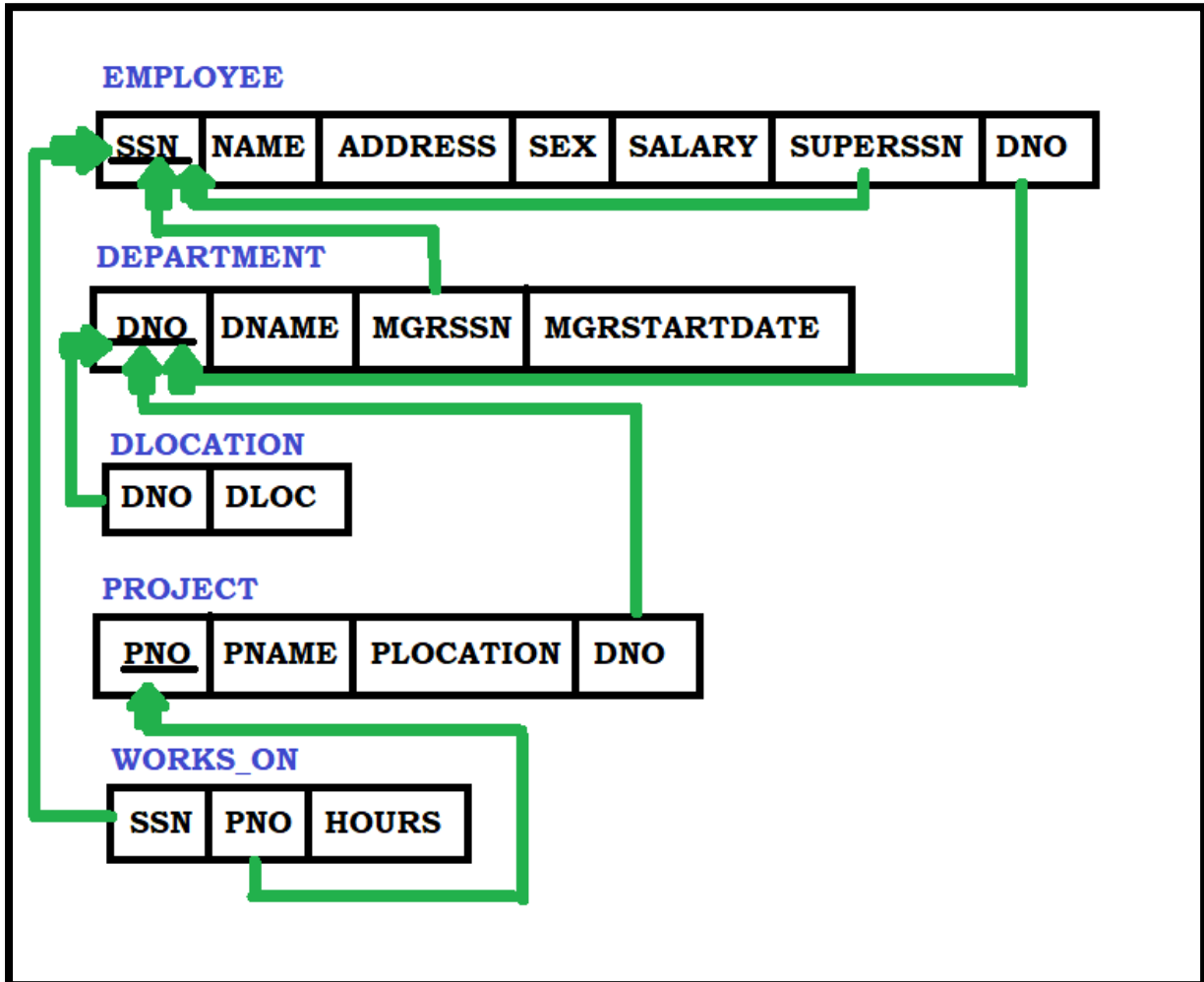
**PROJECT(PNo, PName, PLocation, DNo)**

**WORKS\_ON(SSN, PNo, Hours)**

Write SQL queries to

1. Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.
2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.
3. Find the sum of the salaries of all employees of the 'Accounts' department, as well as the maximum salary, the minimum salary, and the average salary in this department
4. Retrieve the name of each employee who works on all the projects controlled by department number 2 (use NOT EXISTS operator).
5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.

## SCHEMA DIAGRAM:



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## STEPS TO OPEN THE ORACLE DATABASE – 10G EXPRESS EDITION

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Step 1: Open the Browser (Preferred Chrome).

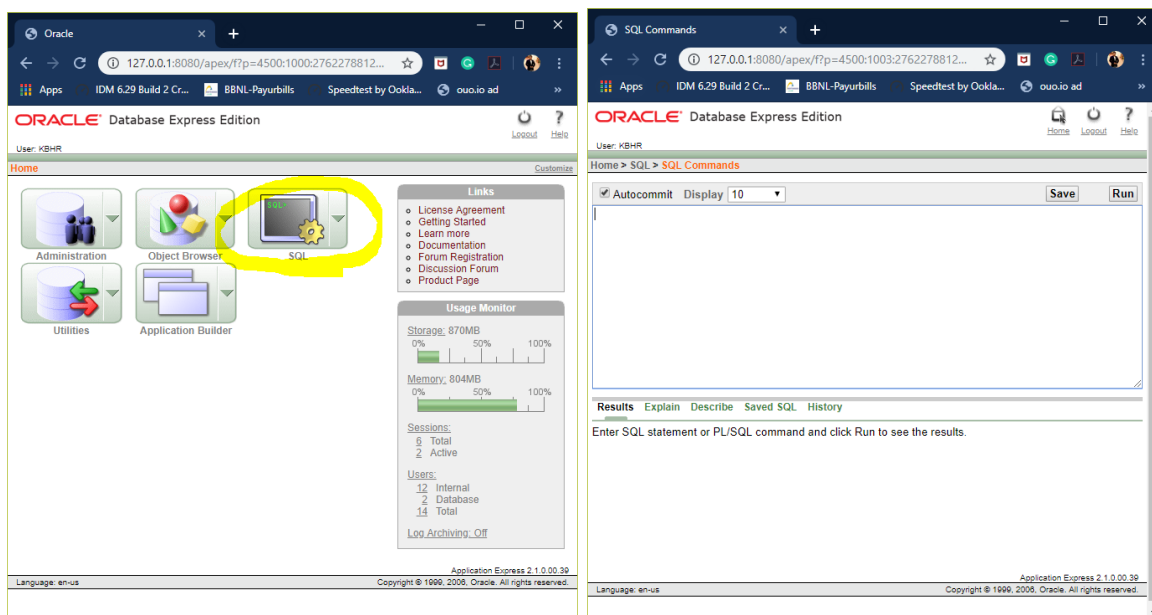
Step 2: <http://127.0.0.1:8080/> Enter the link on the browser.

Step 3: login with your id and password (finding difficulty in login in go to the link to know in-depth details

[https://hemanthrajhemu.github.io/FutureVisionBIE/WP/5CSE/DBMS\\_LAB\\_INFO.html](https://hemanthrajhemu.github.io/FutureVisionBIE/WP/5CSE/DBMS_LAB_INFO.html)

(Note Username is the system by default & Password is the passkey you entered in the installation)

Step 4: Now click on SQL->SQL Commands. This is the place where we execute the SQL Commands.



Step 5: you are in SQL Command Now you can Create table, create view, Run Queries here & lot more.

Or Method -2

[https://hemanthrajhemu.github.io/FutureVisionBIE/WP/5CSE/DBMS\\_LAB\\_METHOD\\_2.html](https://hemanthrajhemu.github.io/FutureVisionBIE/WP/5CSE/DBMS_LAB_METHOD_2.html)

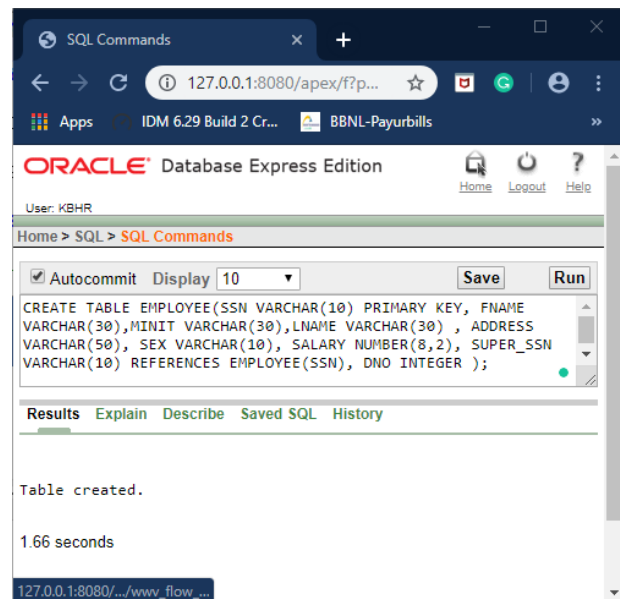
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## Create Table: (Follow the Schema Diagram in Creating the Data Base)

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### 1. Create Table for EMPLOYEE

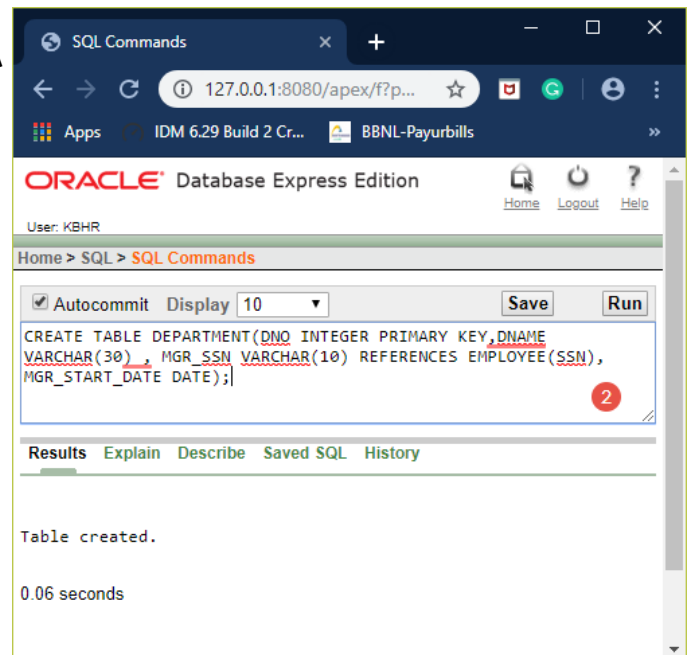
```
CREATE TABLE EMPLOYEE(  
SSN VARCHAR(10) PRIMARY KEY,  
FNAME VARCHAR(30),  
MINIT VARCHAR(30),  
LNAME VARCHAR(30) ,  
ADDRESS VARCHAR(50),  
SEX VARCHAR(10),  
SALARY NUMBER(8,2),  
SUPER_SSN VARCHAR(10)  
REFERENCES EMPLOYEE(SSN),  
DNO INTEGER );
```



Now Run.

### 2. Create Table for DEPARTMENT

```
CREATE TABLE DEPARTMENT(  
DNO INTEGER PRIMARY KEY,  
DNAME VARCHAR(30) ,  
MGR_SSN VARCHAR(10)  
REFERENCES EMPLOYEE(SSN),  
MGR_START_DATE DATE);
```

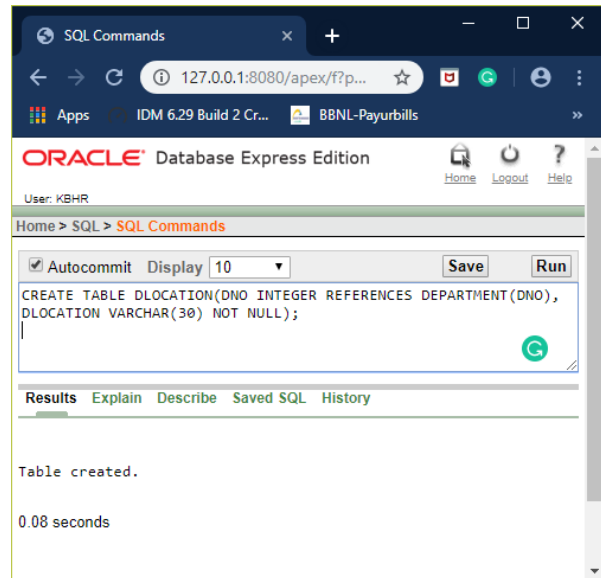


Now Run.

### 3. Create Table for DLOCATION

```
CREATE TABLE DLOCATION(
DNO INTEGER REFERENCES
DEPARTMENT(DNO),
DLOCATION VARCHAR(30)
NOT NULL);
```

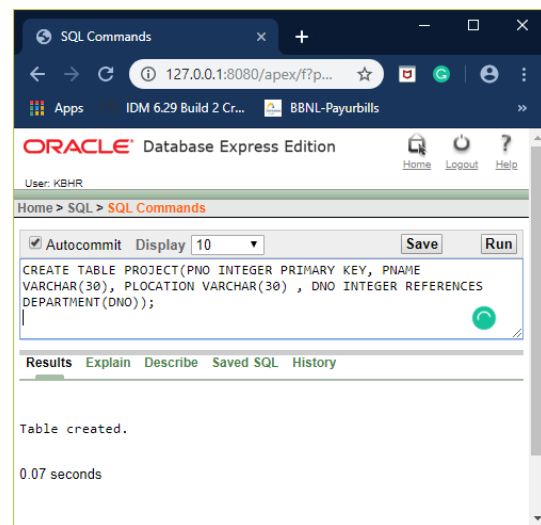
Now Run.



### 4. Create Table for PROJECT

```
CREATE TABLE PROJECT(
PNO INTEGER PRIMARY KEY,
PNAME VARCHAR(30),
PLOCATION VARCHAR(30) ,
DNO INTEGER REFERENCES
DEPARTMENT(DNO));
```

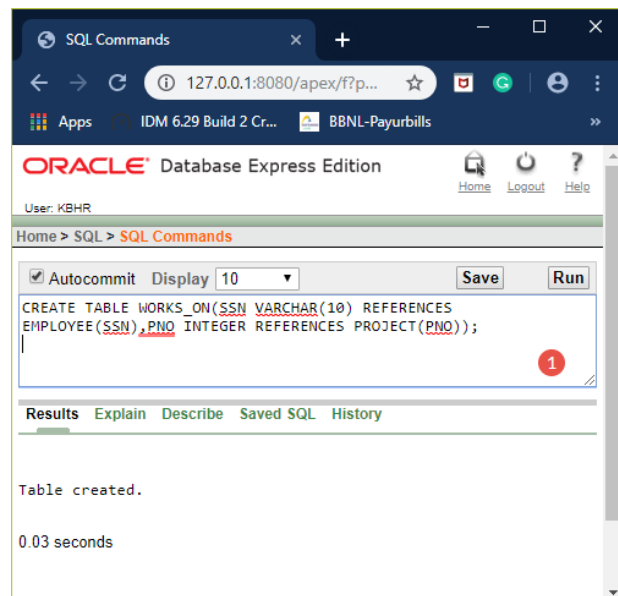
Now Run.



### 5. Create Table for WORKS\_ON

```
CREATE TABLE WORKS_ON(
SSN VARCHAR(10) REFERENCES
EMPLOYEE(SSN),
PNO INTEGER
REFERENCES PROJECT(PNO));
```

Now Run.



---

## TABLE DESCRIPTION

---

### 1. DESC EMPLOYEE;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the command `DESC EMPLOYEE;`. The results are displayed in a table format.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
EMPLOYEE	SSN	Varchar2	10	-	-	1	-	-	-
	FNAME	Varchar2	30	-	-	-	✓	-	-
	MINIT	Varchar2	30	-	-	-	✓	-	-
	LNAME	Varchar2	30	-	-	-	✓	-	-
	ADDRESS	Varchar2	50	-	-	-	✓	-	-
	SEX	Varchar2	10	-	-	-	✓	-	-
	SALARY	Number	-	8	2	-	✓	-	-
	SUPER_SSN	Varchar2	10	-	-	-	✓	-	-
	DNO	Number	-	-	0	-	✓	-	-

Application Express 2.1.0.00.39  
Copyright © 1999, 2006, Oracle. All rights reserved.

### 2. DESC DEPARTMENT;

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the command `DESC DEPARTMENT;`. The results are displayed in a table format.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPARTMENT	DNO	Number	-	-	0	1	-	-	-
	DNAME	Varchar2	30	-	-	-	✓	-	-
	MGR_SSN	Varchar2	10	-	-	-	✓	-	-
	MGR_START_DATE	Date	7	-	-	-	✓	-	-

### 3. DESC DLOCATION;

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL command 'DESC DLOCATION;' has been entered and executed. The results show the structure of the table DLOCATION.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DLOCATION	DNO	Number	-	-	0	-	✓	-	-
DLOCATION	DLOCATION	Varchar2	30	-	-	-	-	-	1-2

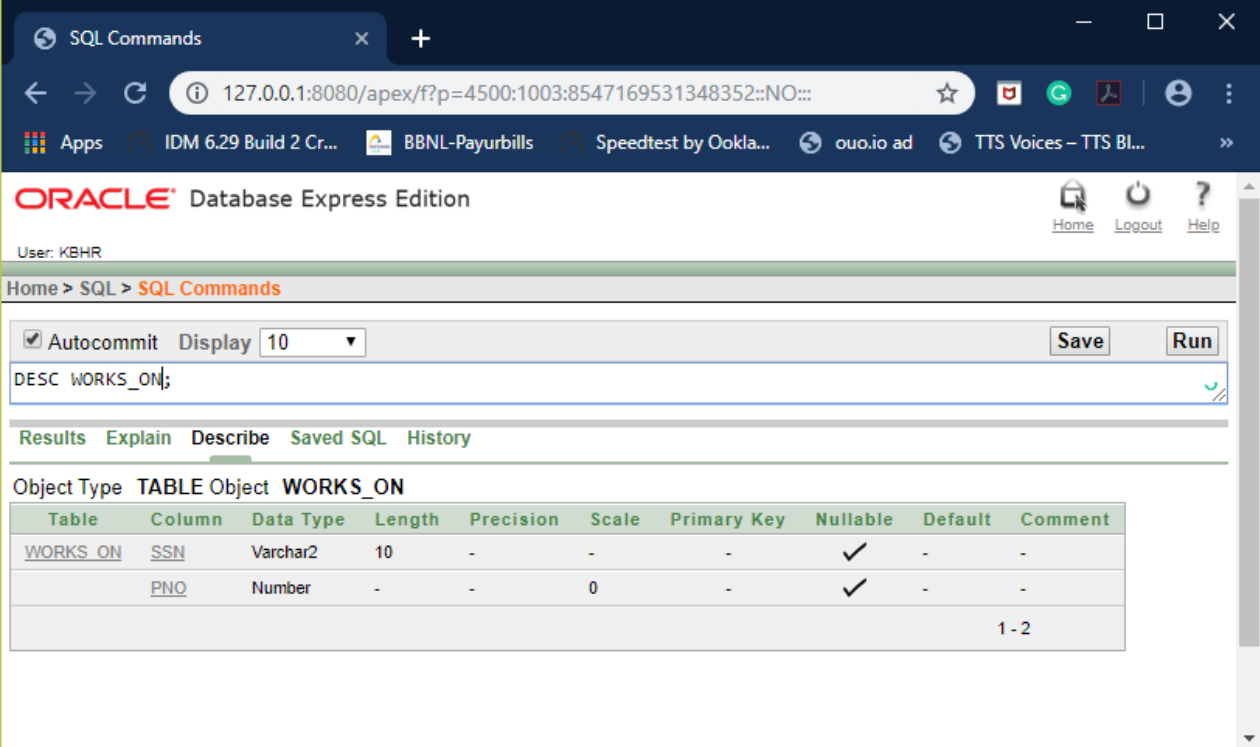
### 4. DESC PROJECT;

The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL command 'DESC PROJECT;' has been entered and executed. The results show the structure of the table PROJECT.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PROJECT	PNO	Number	-	-	0	1	-	-	-
PROJECT	PNAME	Varchar2	30	-	-	-	✓	-	-
PROJECT	PLOCATION	Varchar2	30	-	-	-	✓	-	-
PROJECT	DNO	Number	-	-	0	-	✓	-	-



## 5. DESC WORKS\_ON;



The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL command 'DESC WORKS\_ON;' has been executed, and the results are displayed in a table format. The table structure is as follows:

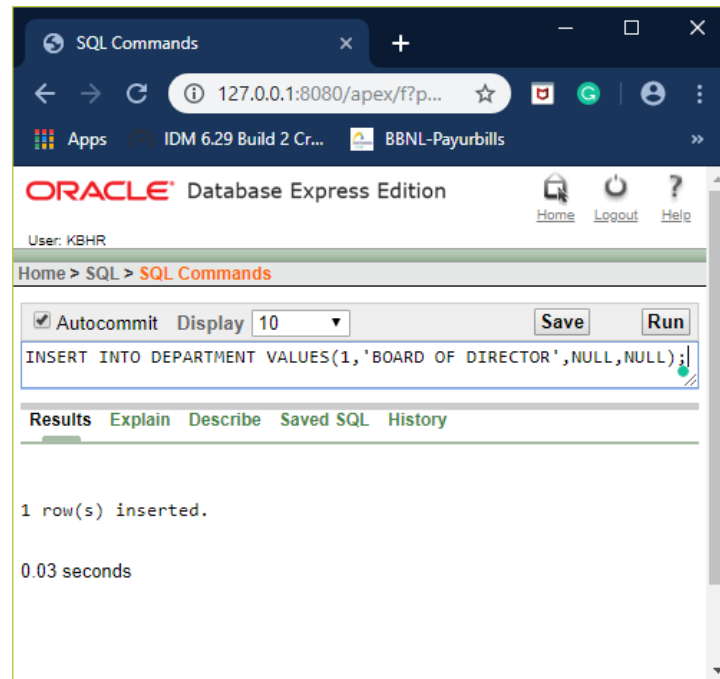
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
WORKS_ON	SSN	Varchar2	10	-	-	-	✓	-	-
	PNO	Number	-	-	0	-	✓	-	-
									1 - 2

## INSERTION OF VALUES TO TABLE

**NOTE : BEFORE ADD THIS TO DEPARTMENT TABLE:**

**INSERT INTO DEPARTMENT VALUES(1, 'BOARD OF DIRECTOR', NULL, NULL);**

**BECAUSE MANAGER WILL BE IN DNO=1 AS 'BOARD OF DIRECTOR' AND DOES NOT HAVE ANY MANAGER ABOVE THEM. IF YOU DIDN'T INSERT THIS VALUE, THEN WE CANNOT ADD THE EMPLOYEE VALUES INTO THE TABLE.**



### 1. VALUES INTO EMPLOYEE

**INSERT INTO EMPLOYEE VALUES(<'SSN'>, <'FNAME'>,<'MINIT'>,<'LNAME'>, <'ADDRESS'>, <'SEX'>, <'SALARY'>, <'SUPER\_SSN'>, <DNO> );**

**INSERT INTO EMPLOYEE VALUES('FVBIE001', 'HEMANTH', 'RSJ', 'K B', 'R T NAGAR', 'MALE', '700000.00', NULL, 1);**

**INSERT INTO EMPLOYEE VALUES('FVBIE002', 'RAJ', 'KUMAR', 'T', 'R T NAGAR', 'MALE', '700000.00', NULL, 1);**

**INSERT INTO EMPLOYEE VALUES('FVBIE003', 'ABDUL', 'MOHAMMED', 'SAMDANI', 'K G F', 'MALE', '700000.00', NULL, 1);**

**INSERT INTO EMPLOYEE VALUES('FVBIE004', 'MAJID', 'H', 'HUSAN', 'KOLAR', 'MALE', '700000.00', 'FVBIE002', 3);**

**INSERT INTO EMPLOYEE VALUES('FVBIE005', 'THANU', 'M', 'SHREE', 'R T NAGAR', 'MALE', '500000.00', 'FVBIE001', 2);**

**INSERT INTO EMPLOYEE VALUES('FVBIE006', 'PUNITH', 'SHAH', 'T', 'R T NAGAR', 'MALE', '500000.00', 'FVBIE001', 2);**

```
INSERT INTO EMPLOYEE VALUES('FVBIE007','PAUL','SAMUAL','SCOTT','R T
NAGAR','MALE','400000.00','FVBIE001',2);
```

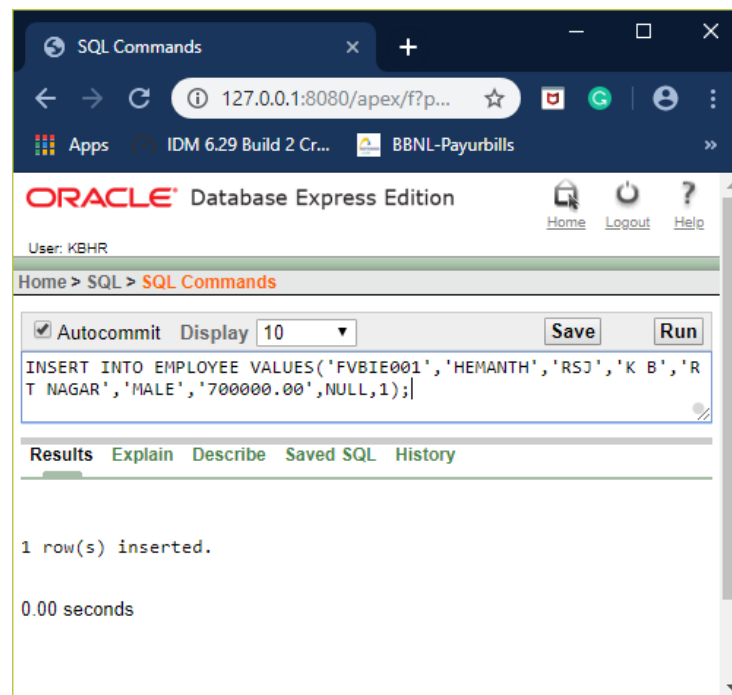
```
INSERT INTO EMPLOYEE
VALUES('FVBIE008','NEHA','SAMPUAL','SCOTT','KENGARI','FEMALE','700000.0
0','FVBIE001',2);
```

```
INSERT INTO EMPLOYEE
VALUES('FVBIE009','ANAND','G','GOWDA','SULTHANPLAYA','MALE','700000.00'
,'FVBIE001',2);
```

```
INSERT INTO EMPLOYEE VALUES('FVBIE010','MANISH','T','GOWDA','L R
BANDE','MALE','500000.00','FVBIE001',2);
```

```
INSERT INTO EMPLOYEE
VALUES('FVBIE011','HIMANSHU','G','VARTHA','BUVENESHAWARA','MALE','50000
0.00','FVBIE002',3);
```

```
INSERT INTO EMPLOYEE
VALUES('FVBIE012','SNEHA','G','THADHOKAR','KAVERI','FEMALE','500000.00'
,'FVBIE003',5);
```



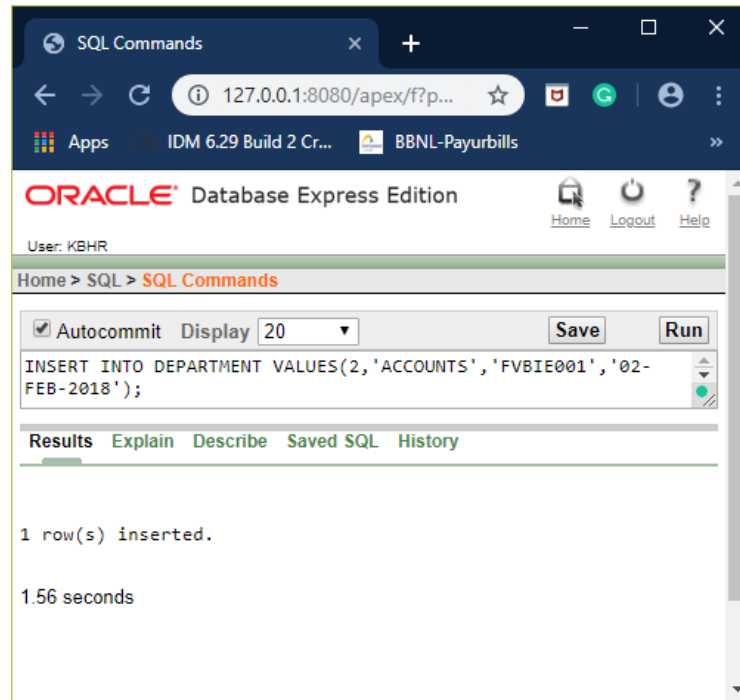
## 2. VALUES INTO DEPARTMENT

```
INSERT INTO DEPARTMENT VALUES(<DNO>,<'DNAME'>,<'MGR_SSN'>,
<'MGR_START_DATE'>);
```

```
INSERT INTO DEPARTMENT VALUES(2,'ACCOUNTS','FVBIE001','02-FEB-2018');
```

```
INSERT INTO DEPARTMENT VALUES(3,'IOT','FVBIE002','18-JUL-2018');
```

```
INSERT INTO DEPARTMENT VALUES(5,'CSE','FVBIE003','1-JAN-2017');
```



### 3. VALUES INTO DLOCATION

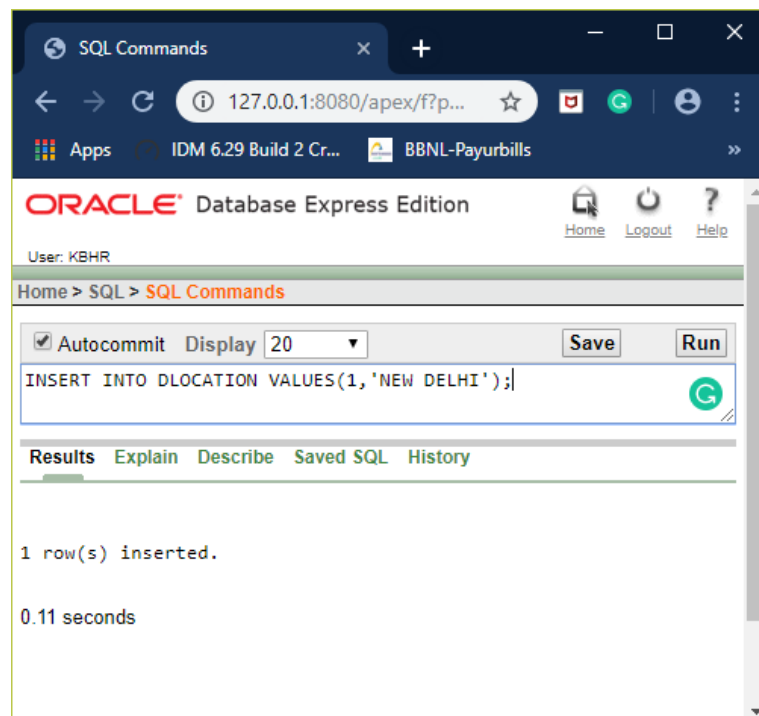
**INSERT INTO DLOCATION VALUES(<DNO>,<'DLOCATION'>);**

INSERT INTO DLOCATION VALUES(1, 'NEW DELHI');

INSERT INTO DLOCATION VALUES(2, 'BANGLORE');

INSERT INTO DLOCATION VALUES(3, 'MYSORE');

INSERT INTO DLOCATION VALUES(5, 'HYDERABAD');

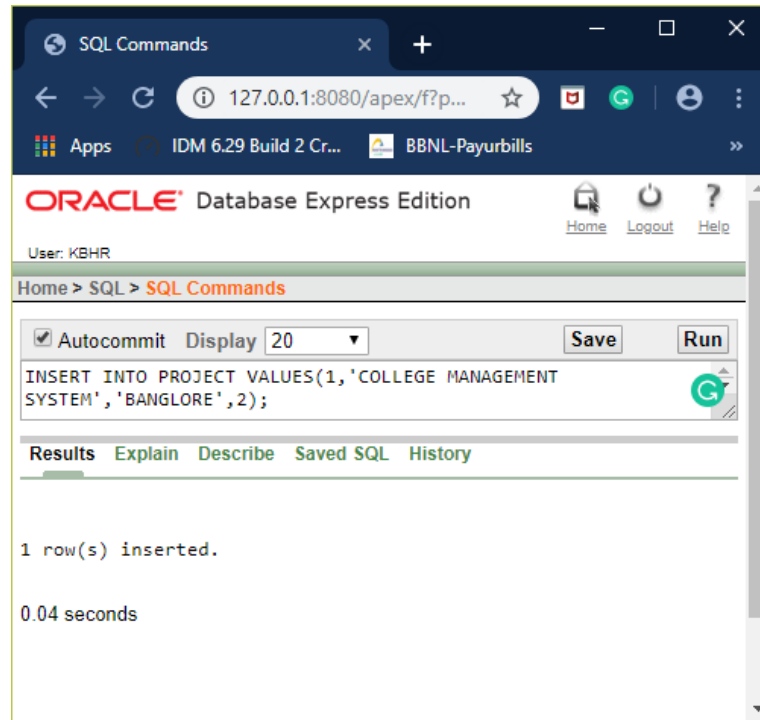


### 4. VALUES INTO PROJECT

**INSERT INTO PROJECT VALUES(<PNO>, <'PNAME'>, <'PLOCATION'>, <DNO>);**

INSERT INTO PROJECT VALUES(1, 'COLLEGE MANAGEMENT SYSTEM', 'BANGLORE', 2);

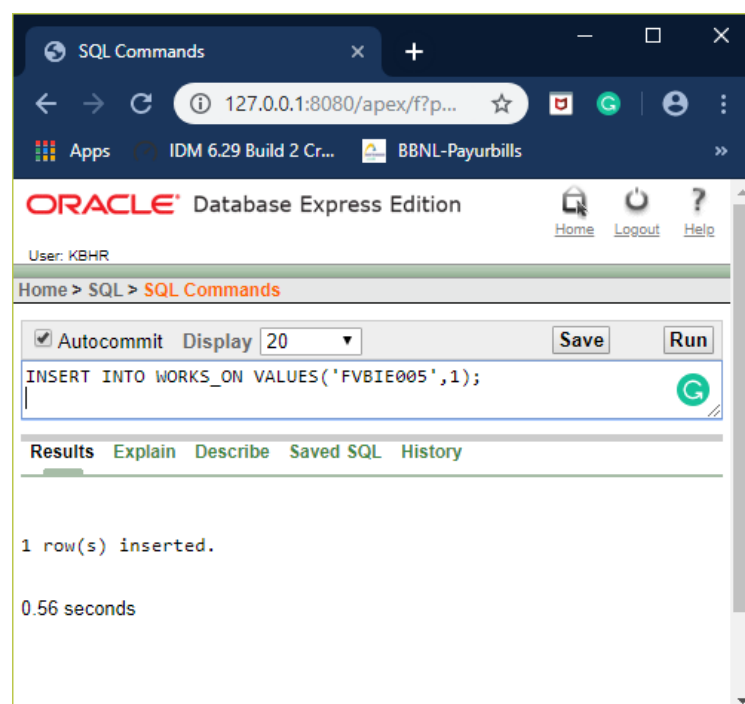
INSERT INTO PROJECT VALUES(2, 'BLOOD MANAGEMENT SYSTEM', 'MYSORE', 3);



## 5. VALUES INTO WORKS\_ON

**INSERT INTO WORKS\_ON VALUES(<'SSN'>,<PNO>);**

```
INSERT INTO WORKS_ON VALUES('FVBIE005',1);
INSERT INTO WORKS_ON VALUES('FVBIE006',1);
INSERT INTO WORKS_ON VALUES('FVBIE007',1);
INSERT INTO WORKS_ON VALUES('FVBIE008',1);
INSERT INTO WORKS_ON VALUES('FVBIE009',1);
INSERT INTO WORKS_ON VALUES('FVBIE010',1);
INSERT INTO WORKS_ON VALUES('FVBIE011',2);
INSERT INTO WORKS_ON VALUES('FVBIE004',2);
```



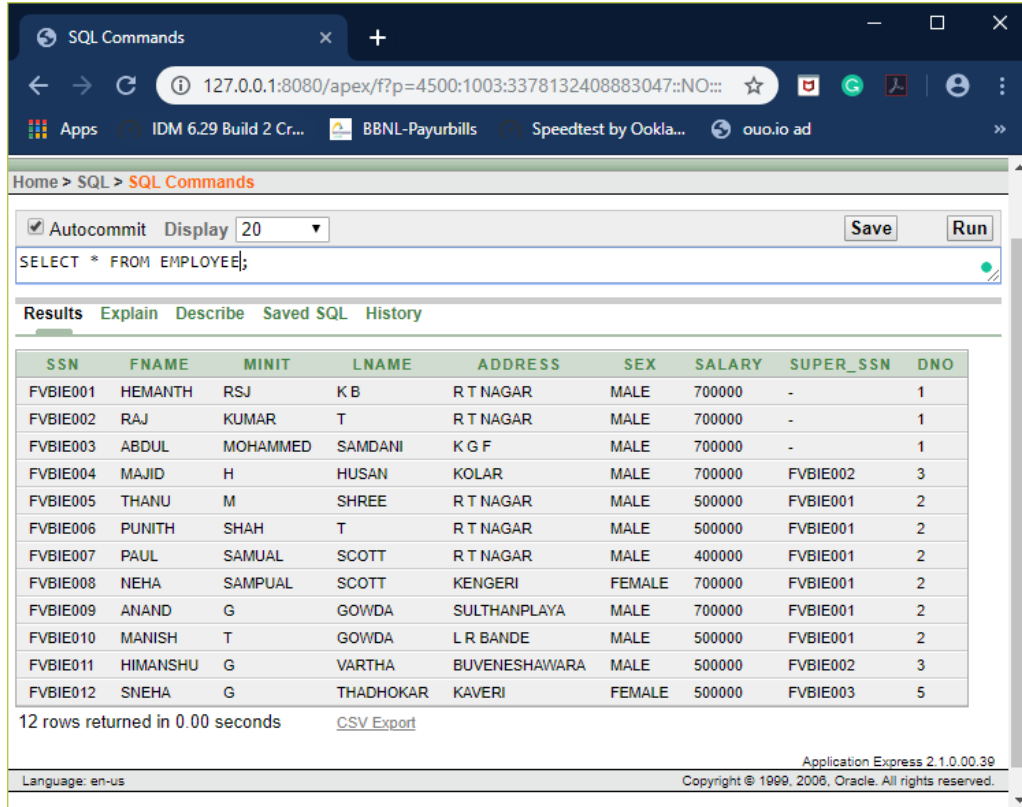
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## RETRIEVAL OF INSERTED VALUES

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### 1. EMPLOYEE:

**SELECT \* FROM EMPLOYEE;**



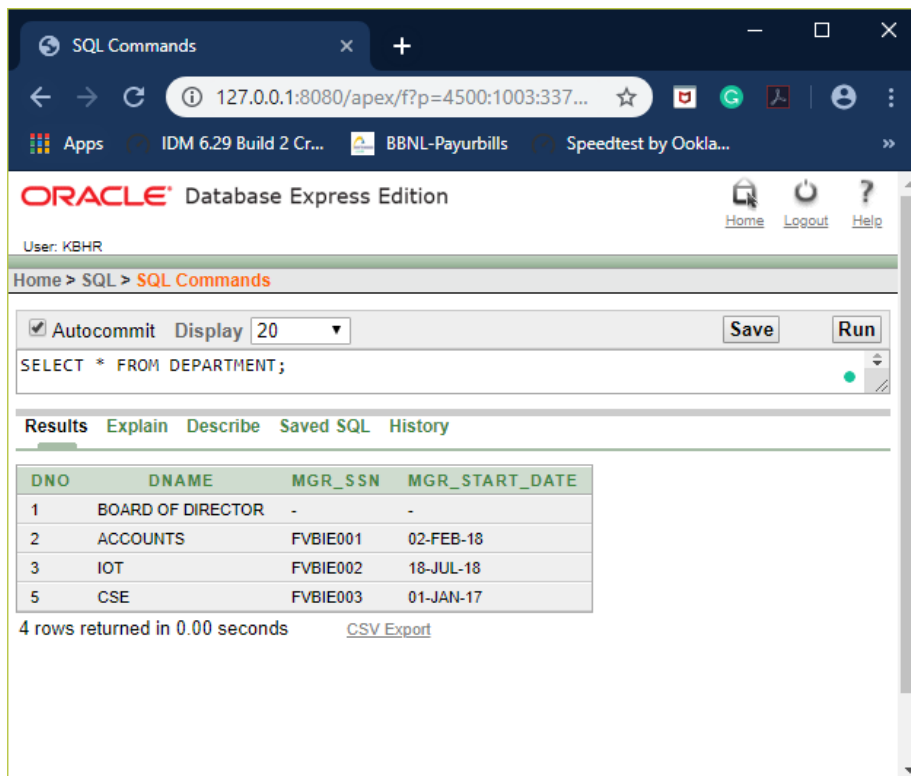
The screenshot shows the SQL Developer interface with the following details:

- Browser: 127.0.0.1:8080/apex/f?p=4500:1003:3378132408883047::NO::
- Page: Home > SQL > SQL Commands
- Autocommit:  Display: 20
- SQL Command: `SELECT * FROM EMPLOYEE;`
- Results: 12 rows returned in 0.00 seconds
- Table Structure:

SSN	FNAME	MINIT	LNAME	ADDRESS	SEX	SALARY	SUPER_SSN	DNO
FVBI001	HEMANTH	RSJ	KB	R T NAGAR	MALE	700000	-	1
FVBI002	RAJ	KUMAR	T	R T NAGAR	MALE	700000	-	1
FVBI003	ABDUL	MOHAMMED	SAMDANI	K G F	MALE	700000	-	1
FVBI004	MAJID	H	HUSAN	KOLAR	MALE	700000	FVBI002	3
FVBI005	THANU	M	SHREE	R T NAGAR	MALE	500000	FVBI001	2
FVBI006	PUNITH	SHAH	T	R T NAGAR	MALE	500000	FVBI001	2
FVBI007	PAUL	SAMUAL	SCOTT	R T NAGAR	MALE	400000	FVBI001	2
FVBI008	NEHA	SAMPUAL	SCOTT	KENGERI	FEMALE	700000	FVBI001	2
FVBI009	ANAND	G	GOWDA	SULTHANPLAYA	MALE	700000	FVBI001	2
FVBI010	MANISH	T	GOWDA	LR BANDE	MALE	500000	FVBI001	2
FVBI011	HIMANSHU	G	VARTHA	BUVENESHAWARA	MALE	500000	FVBI002	3
FVBI012	SNEHA	G	THADHOKAR	KAVERI	FEMALE	500000	FVBI003	5

### 2. DEPARTMENT:

**SELECT \* FROM DEPARTMENT;**



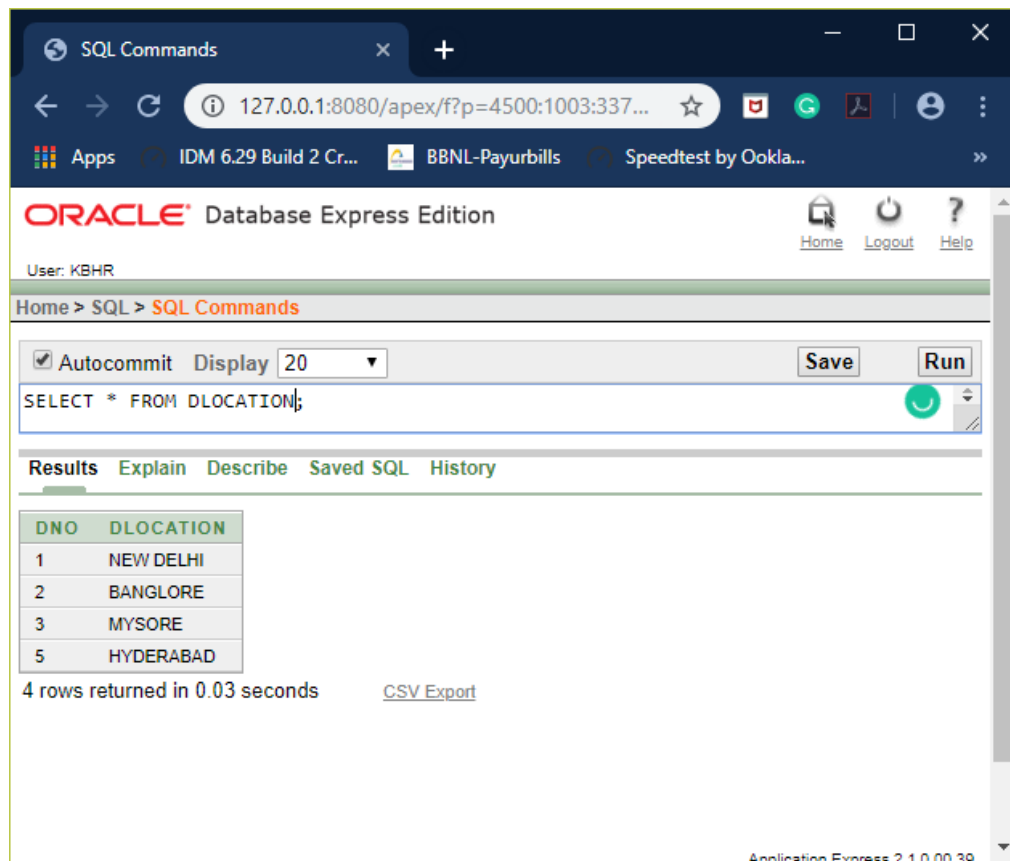
The screenshot shows the SQL Developer interface with the following details:

- Browser: 127.0.0.1:8080/apex/f?p=4500:1003:337...
- Page: Home > SQL > SQL Commands
- Autocommit:  Display: 20
- SQL Command: `SELECT * FROM DEPARTMENT;`
- Results: 4 rows returned in 0.00 seconds
- Table Structure:

DNO	DNAME	MGR_SSN	MGR_START_DATE
1	BOARD OF DIRECTOR	-	-
2	ACCOUNTS	FVBI001	02-FEB-18
3	IOT	FVBI002	18-JUL-18
5	CSE	FVBI003	01-JAN-17

### 3. DLOCATION:

SELECT \* FROM DLOCATION;



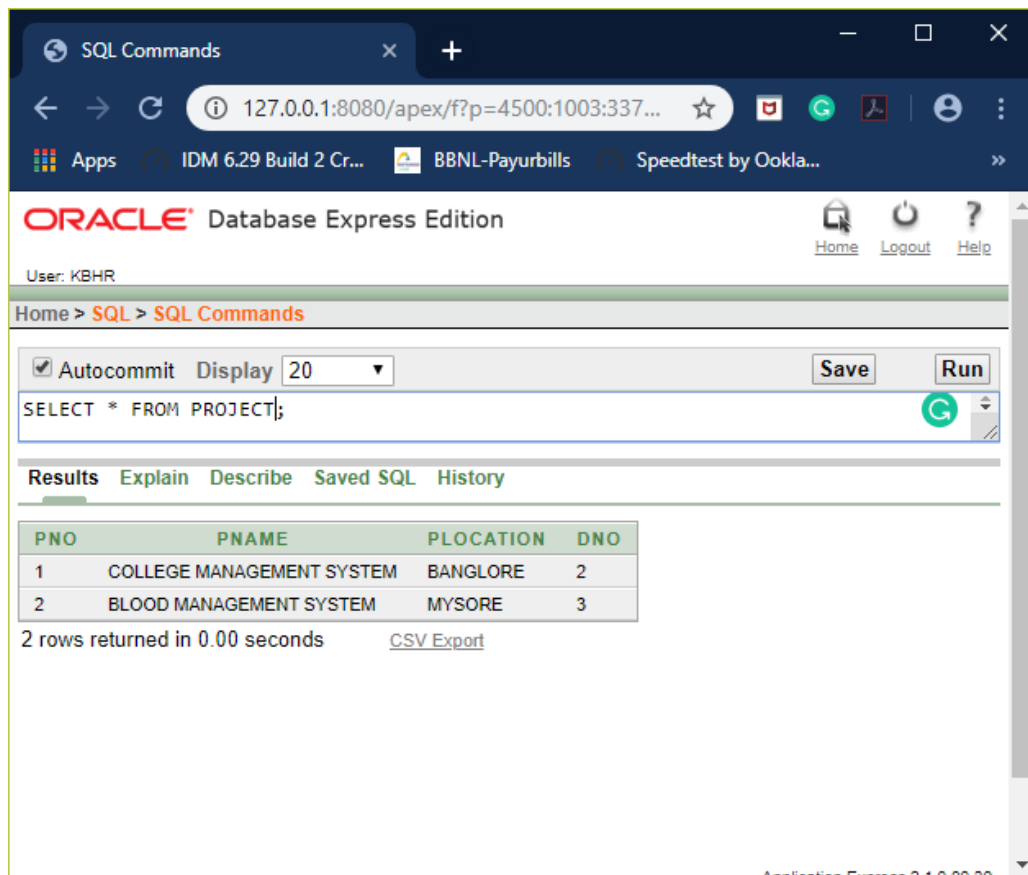
The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL command entered is `SELECT * FROM DLOCATION;`. The results are displayed in a table with 4 rows:

DNO	DLOCATION
1	NEW DELHI
2	BANGLORE
3	MYSORE
5	HYDERABAD

4 rows returned in 0.03 seconds. [CSV Export](#)

### 4. PROJECT:

SELECT \* FROM PROJECT;



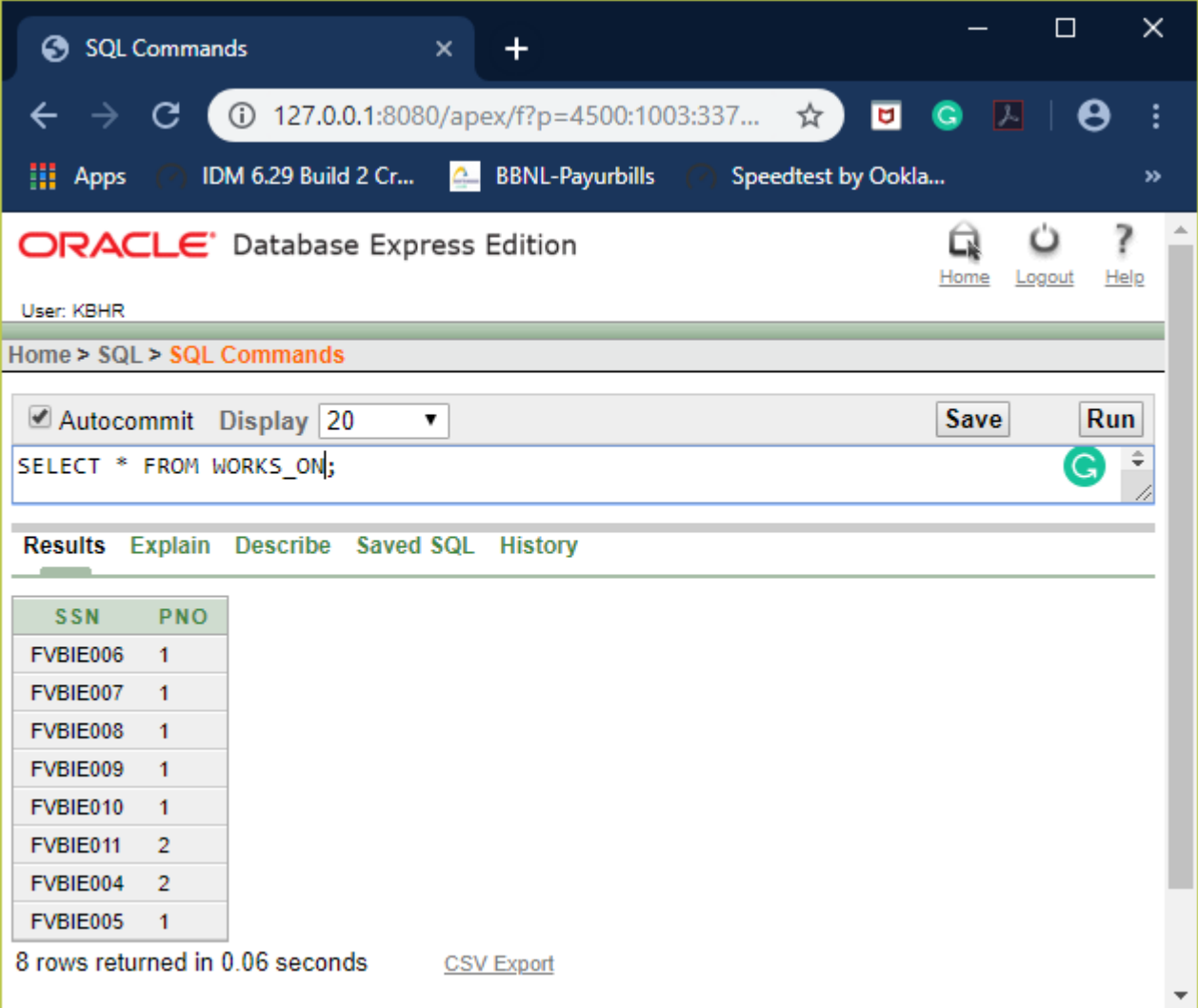
The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL command entered is `SELECT * FROM PROJECT;`. The results are displayed in a table with 2 rows:

PNO	PNAME	PLOCATION	DNO
1	COLLEGE MANAGEMENT SYSTEM	BANGLORE	2
2	BLOOD MANAGEMENT SYSTEM	MYSORE	3

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

## 5. WORKS\_ON:

`SELECT * FROM WORKS_ON;`



The screenshot shows the Oracle Database Express Edition SQL Commands interface. The browser address bar displays the URL `127.0.0.1:8080/apex/f?p=4500:1003:337...`. The page title is "ORACLE Database Express Edition". The user is logged in as "User: KBHR". The breadcrumb navigation shows "Home > SQL > SQL Commands". The SQL command entered is `SELECT * FROM WORKS_ON;`. The results are displayed in a table with two columns: "SSN" and "PNO". The results show 8 rows returned in 0.06 seconds. A "CSV Export" link is available below the table.

SSN	PNO
FVBIE006	1
FVBIE007	1
FVBIE008	1
FVBIE009	1
FVBIE010	1
FVBIE011	2
FVBIE004	2
FVBIE005	1

8 rows returned in 0.06 seconds [CSV Export](#)



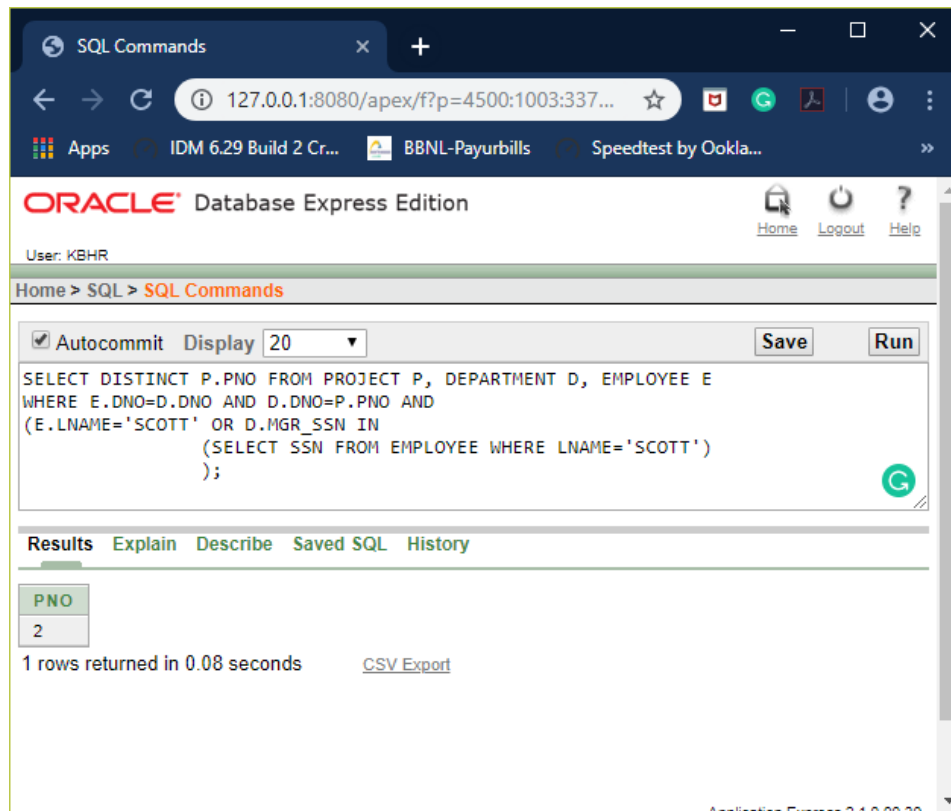
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## QUERIES

---

1. Make a list of all project numbers for projects that involve an employee whose last name is 'Scott', either as a worker or as a manager of the department that controls the project.

```
SELECT DISTINCT P.PNO
FROM PROJECT P, DEPARTMENT D, EMPLOYEE E
WHERE E.DNO=D.DNO AND D.DNO=P.PNO AND
(E.LNAME='SCOTT' OR
      D.MGR_SSN IN
      (SELECT SSN FROM EMPLOYEE WHERE LNAME='SCOTT'))
);
```



The screenshot shows the Oracle Database Express Edition interface. The user is logged in as KBHR. The SQL Commands window contains the following query:

```
SELECT DISTINCT P.PNO FROM PROJECT P, DEPARTMENT D, EMPLOYEE E
WHERE E.DNO=D.DNO AND D.DNO=P.PNO AND
(E.LNAME='SCOTT' OR D.MGR_SSN IN
      (SELECT SSN FROM EMPLOYEE WHERE LNAME='SCOTT'))
);
```

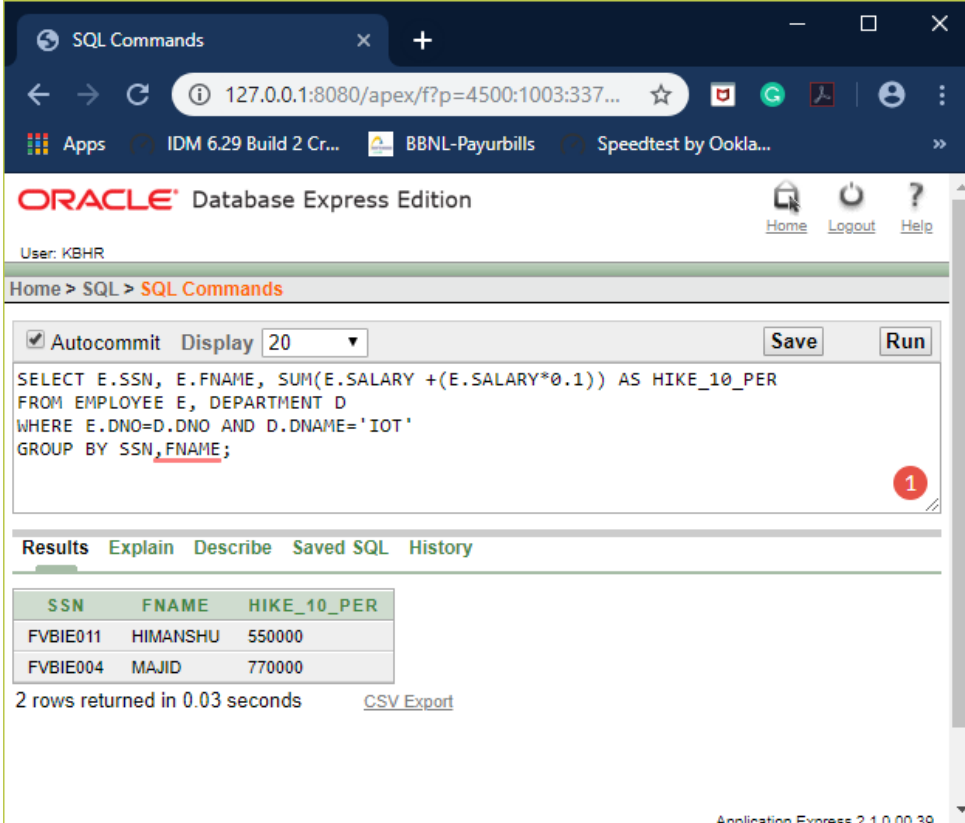
The query has been executed, and the results are displayed in a table with one row:

PNO
2

1 rows returned in 0.08 seconds [CSV Export](#)

## 2. Show the resulting salaries if every employee working on the 'IoT' project is given a 10 percent raise.

```
SELECT E.SSN, E.FNAME, SUM(E.SALARY +(E.SALARY*0.1)) AS HIKE_10_PER  
FROM EMPLOYEE E, DEPARTMENT D  
WHERE E.DNO=D.DNO AND D.DNAME='IOT'  
GROUP BY SSN,FNAME;
```



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

```
SELECT E.SSN, E.FNAME, SUM(E.SALARY +(E.SALARY*0.1)) AS HIKE_10_PER  
FROM EMPLOYEE E, DEPARTMENT D  
WHERE E.DNO=D.DNO AND D.DNAME='IOT'  
GROUP BY SSN,FNAME;
```

The results are displayed in a table with the following columns: SSN, FNAME, and HIKE\_10\_PER. The results are:

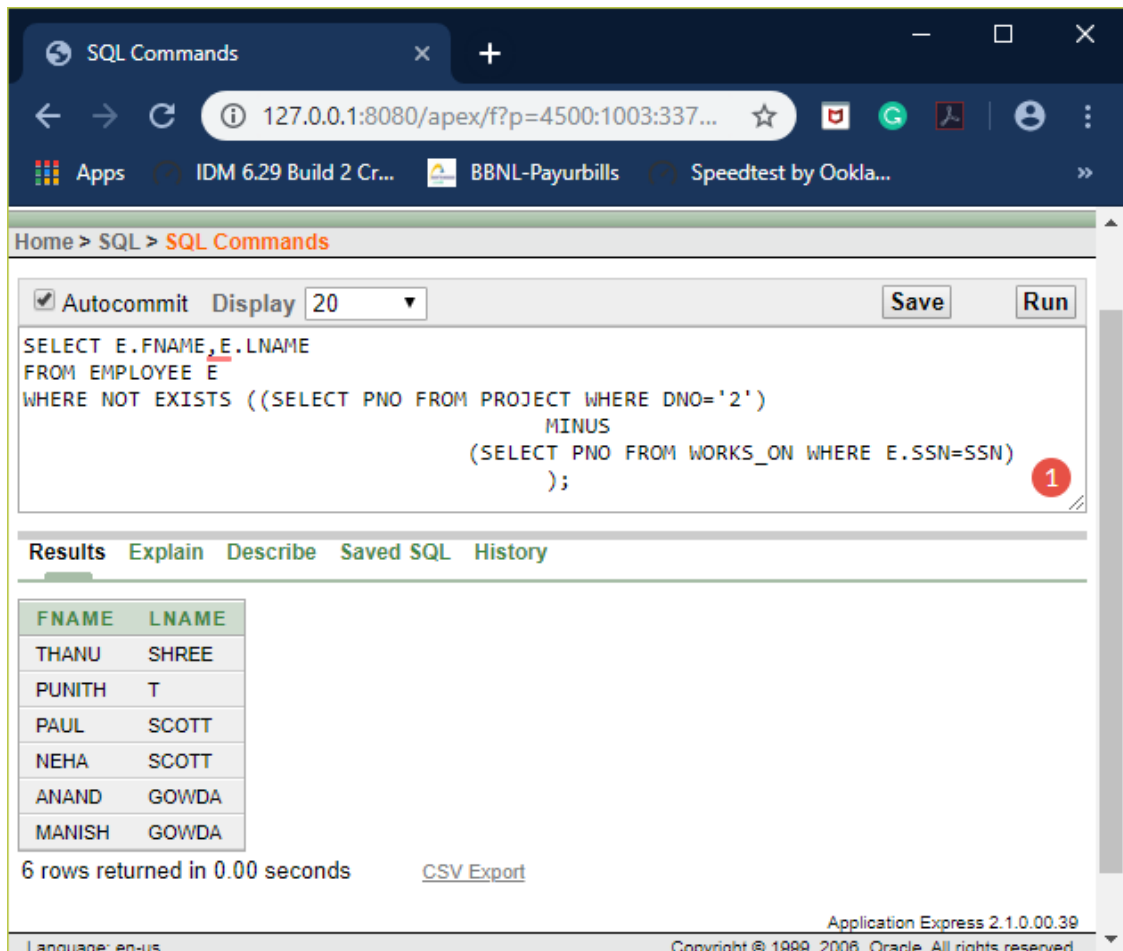
SSN	FNAME	HIKE_10_PER
FVBIE011	HIMANSHU	550000
FVBIE004	MAJID	770000

2 rows returned in 0.03 seconds [CSV Export](#)



#### 4. Retrieve the name of each employee who works on all the projects controlled by department number 2 (use NOT EXISTS operator).

```
SELECT E.FNAME,E.LNAME
FROM EMPLOYEE E
WHERE NOT EXISTS ((SELECT PNO FROM PROJECT WHERE DNO='2')
                  MINUS
                  (SELECT PNO FROM WORKS_ON WHERE E.SSN=SSN)
                  );
```



The screenshot shows a web browser window with the URL `127.0.0.1:8080/apex/f?p=4500:1003:337...`. The page title is "SQL Commands". The main content area displays the following SQL query:

```
SELECT E.FNAME,E.LNAME
FROM EMPLOYEE E
WHERE NOT EXISTS ((SELECT PNO FROM PROJECT WHERE DNO='2')
                  MINUS
                  (SELECT PNO FROM WORKS_ON WHERE E.SSN=SSN)
                  );
```

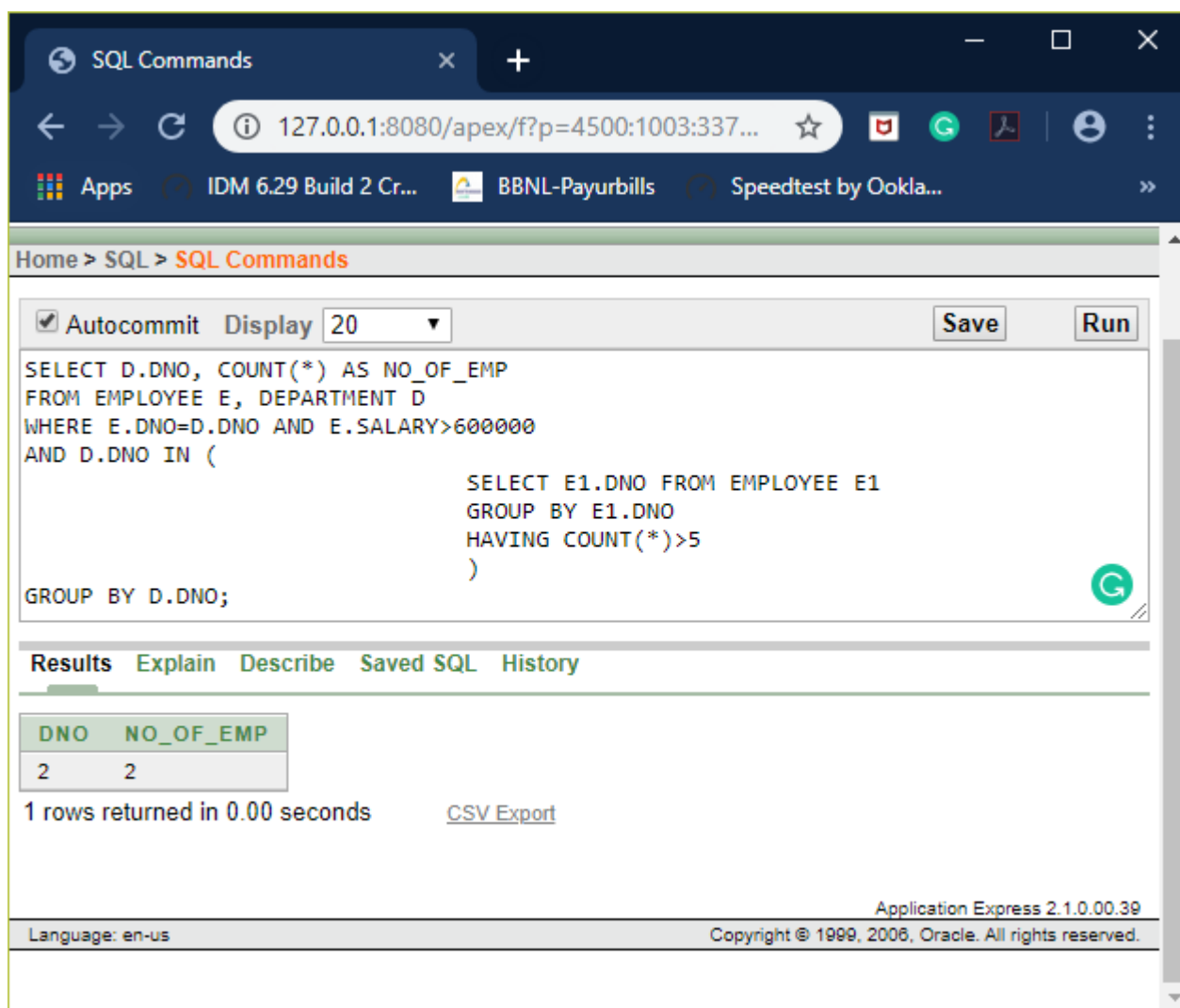
Below the query, there are tabs for "Results", "Explain", "Describe", "Saved SQL", and "History". The "Results" tab is active, showing a table with the following data:

FNAME	LNAME
THANU	SHREE
PUNITH	T
PAUL	SCOTT
NEHA	SCOTT
ANAND	GOWDA
MANISH	GOWDA

Below the table, it says "6 rows returned in 0.00 seconds" and provides a "CSV Export" link. The footer of the application window shows "Application Express 2.1.0.00.39" and "Copyright © 1999, 2008, Oracle. All rights reserved."

5. For each department that has more than five employees, retrieve the department number and the number of its employees who are making more than Rs. 6,00,000.

```
SELECT D.DNO, COUNT(*) AS NO_OF_EMP
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.DNO=D.DNO AND E.SALARY>600000
AND D.DNO IN (
                SELECT E1.DNO FROM EMPLOYEE E1
                GROUP BY E1.DNO
                HAVING COUNT(*)>5
            )
GROUP BY D.DNO;
```



The screenshot shows a web browser window titled "SQL Commands" with the URL `127.0.0.1:8080/apex/f?p=4500:1003:337...`. The browser's address bar and tabs are visible. Below the browser, the Oracle SQL Command window is open, displaying the following SQL query:

```
SELECT D.DNO, COUNT(*) AS NO_OF_EMP
FROM EMPLOYEE E, DEPARTMENT D
WHERE E.DNO=D.DNO AND E.SALARY>600000
AND D.DNO IN (
                SELECT E1.DNO FROM EMPLOYEE E1
                GROUP BY E1.DNO
                HAVING COUNT(*)>5
            )
GROUP BY D.DNO;
```

The "Run" button is clicked, and the results are displayed in a table:

DNO	NO_OF_EMP
2	2

Below the table, it states "1 rows returned in 0.00 seconds" and provides a "CSV Export" link. The footer of the window shows "Application Express 2.1.0.00.39" and "Copyright © 1999, 2006, Oracle. All rights reserved."

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**THE END**

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