Database Management System

Practical File - 1

Name: Rishi Chaitanya Goud

Course: B. Sc. (H) Computer Science, II Year, IV Semester

College Roll No: CSC/21/16 University Roll No: 21059570016 Submitted to: Ms. Neha Kumari

A. Create the following database schema EMP-DEPT with all specified constraints

and use it to answer the given queries.

```
CODE: CREATE DATABASE Rishi_16;
USE Rishi_16;
CREATE TABLE department
 Dno int(11) NOT NULL,
 Dname varchar(50) DEFAULT NULL,
 Location varchar(50) DEFAULT NULL,
 PRIMARY KEY (Dno)
INSERT INTO department VALUES
(10,'Accounting','New York'),
(20, 'Research', 'Dallas'),
(30, 'Sales', 'Chicago'),
(40, 'Operation', 'Boston'),
(50, 'Marketing', 'New Delhi');
CREATE TABLE employee
 Eno char(3) NOT NULL,
 Ename varchar(50) NOT NULL,
 Job_type varchar(50) NOT NULL,
 Supervision char(3) DEFAULT NULL,
 Hire_date date NOT NULL,
 Dno int(11) DEFAULT NULL,
```

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OUTPUT:

```
Commission decimal(10,2) DEFAULT NULL,
 Salary decimal(7,2) NOT NULL,
 PRIMARY KEY (Eno),
 CONSTRAINT Dno FOREIGN KEY (Dno) REFERENCES department (Dno),
 CONSTRAINT Manager FOREIGN KEY (Manager) REFERENCES employee (Eno)
  INSERT INTO employee VALUES ('736', 'Smith', 'Clerk', '790', '1981-12-
17',20,0.00,1000.00),
('749', 'Allan', 'Sales_man', '769', '1981-02-20', 30, 300.00, 2000.00),
('752', 'Ward', 'Sales man', '769', '1981-02-22', 30, 500.00, 1300.00),
('756', 'Jones', 'Manager', '783', '1981-04-02', 20, 0.00, 2300.00),
('765', 'Martin', 'Sales_man', '784', '1981-04-22', 30, 1400.00, 1250.00),
('769', 'Blake', 'Manager', '783', '1981-05-01', 30, 0.00, 2870.00),
('778','Clark','Manager','783','1981-06-09',10,0.00,2900.00),
('783', 'King', 'President', NULL, '1981-11-17', 10, 0.00, 2950.00),
('784','Turner','Sales_man','769','1981-09-08',30,0.00,1450.00),
('787','Adams','Clerk','778','1983-01-12',20,0.00,1150.00),
('788', 'Scott', 'Analyst', '756', '1982-12-09', 20, 0.00, 2850.00),
('790','James','Clerk','769','1981-12-03',30,0.00,950.00),
('792', 'Ford', 'Analyst', '756', '1981-12-03', 20, 0.00, 2600.00),
('793','Miller','Clerk','788','1982-01-23',40,0.00,1300.00);
   → Select * from Department;
```

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mysql> select * from Department;					
•	Dname	•			
10 20 30 40	Accounting Research	New York Dallas Chicago Boston			
+++ 5 rows in set (0.03 sec)					

→ Select * from Employee;

OUTPUT:

no Ename	Job_type	Manager	Hire_date	Dno	Commission	Salary
 736 Smith	-+ Clerk	790	 1981-12-17	20	0.00	1000.00
749 Allan	Sales_man	769	1981-02-20	30	300.00	2000.00
752 Ward	Sales_man	769	1981-02-22	30	500.00	1300.00
756 Jones	Manager	783	1981-04-02	20	0.00	2300.00
765 Martin	Sales_man	784	1981-04-22	30	1400.00	1250.00
769 Blake	Manager	783	1981-05-01	30	0.00	2870.00
778 Clark	Manager	783	1981-06-09	10	0.00	2900.00
783 King	President	NULL	1981-11-17	10	0.00	2950.00
784 Turner	Sales_man	769	1981-09-08	30	0.00	1450.00
787 Adams	Clerk	778	1983-01-12	20	0.00	1150.00
788 Scott	Analyst	756	1982-12-09	20	0.00	2850.00
790 James	Clerk	769	1981-12-03	30	0.00	950.00
792 Ford	Analyst	756	1981-12-03	20	0.00	2600.00
793 Miller	Clerk	788	1982-01-23	40	0.00	1300.00

QUERIES

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.

CODE: SELECT Eno, Ename, Job_type, Hire_date FROM employee;

OUTPUT:

```
mysql> SELECT Eno, Ename, Job_type, Hire_date FROM employee;
              | Job_type
 Eno | Ename
                          | Hire_date
  736
       Smith
              Clerk
                           1981-12-17
       Allan
              Sales_man
 749 l
                           1981-02-20
 752
       Ward
                Sales_man
                           1981-02-22
 756
       Jones
              Manager
                           1981-04-02
 765
       Martin | Sales_man
                           1981-04-22
 769 | Blake
              Manager
                           1981-05-01
 778 | Clark
              Manager
                           1981-06-09
 783
       King
              | President | 1981-11-17
 784
       Turner | Sales_man | 1981-09-08
 787
       Adams
                Clerk
                           1983-01-12
 788
       Scott
              Analyst
                           1982-12-09
 790
       James
              Clerk
                           1981-12-03
 792
       Ford
              Analyst
                           1981-12-03
 793 | Miller | Clerk
                          1982-01-23
14 rows in set (0.01 sec)
```

2. Query to display unique Jobs from the Employee Table.

CODE: SELECT DISTINCT Job_type FROM employee; OUTPUT:

3. Query to display the Employee Name concatenated by a Job separated by a comma.

CODE: SELECT CONCAT(Ename, ',', Job_type) AS Name_Job FROM employee;

OUTPUT:

```
mysql> SELECT CONCAT(Ename, ',', Job_type) AS Name_Job FROM employee;
 Name_Job
 Smith,Clerk
 Allan,Sales_man
 Ward,Sales_man
 Jones, Manager
 Martin,Sales_man
 Blake,Manager
 Clark, Manager
 King, President
 Turner,Sales_man
 Adams,Clerk
 Scott,Analyst
 James,Clerk
 Ford, Analyst
 Miller,Clerk
14 rows in set (0.01 sec)
```

4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.

CODE: SELECT CONCAT(Eno , ', ', Ename, ',', Job_type, ', ',Manager, ',', Hire_date, ',',Dno, ',',Commission, ',',Salary) AS THE_OUTPUT FROM employee;

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OUTPUT:

```
mysql> SELECT CONCAT(Eno , ', ', Ename, ',', Job_type, ', ',Manager, ',' ,Hire_date, ',' ,Dno, ',' ,Commission, ','
ary) AS THE_OUTPUT FROM employee;
 THE_OUTPUT
  736, Smith, Clerk, 790, 1981-12-17, 20, 0.00, 1000.00
  749, Allan, Sales_man, 769, 1981-02-20, 30, 300.00, 2000.00
 752, Ward, Sales_man, 769,1981-02-22,30,500.00,1300.00
  756, Jones, Manager, 783, 1981-04-02, 20, 0.00, 2300.00
  765, Martin, Sales_man, 784,1981-04-22,30,1400.00,1250.00
  769, Blake, Manager, 783, 1981-05-01, 30, 0.00, 2870.00
  778, Clark, Manager, 783, 1981-06-09, 10, 0.00, 2900.00
  NULL
  784, Turner, Sales_man, 769,1981-09-08,30,0.00,1450.00
  787, Adams, Clerk, 778, 1983-01-12, 20, 0.00, 1150.00
  788, Scott, Analyst, 756, 1982-12-09, 20, 0.00, 2850.00
 790, James, Clerk, 769, 1981-12-03, 30, 0.00, 950.00
  792, Ford, Analyst, 756, 1981-12-03, 20, 0.00, 2600.00
  793, Miller, Clerk, 788, 1982-01-23, 40, 0.00, 1300.00
14 rows in set (0.00 sec)
```

5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.

CODE: SELECT Ename, Salary FROM employee WHERE (Salary + Commission) > 2850;

```
mysql> SELECT Ename, Salary FROM employee WHERE ( Salary + Commission ) > 2850;
+----+
| Ename | Salary |
+----+
| Blake | 2870.00 |
| Clark | 2900.00 |
| King | 2950.00 |
+----+
3 rows in set (0.01 sec)
```

6. Query to display Employee Name and Department Number for the Employee No= 790.

CODE: SELECT Ename, Dno FROM employee WHERE Eno='790'; OUTPUT:

```
mysql> SELECT Ename,Dno FROM employee WHERE Eno='790';
+----+
| Ename | Dno |
+----+
| James | 30 |
+----+
1 row in set (0.01 sec)
```

7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.

CODE: SELECT Ename, Salary FROM employee WHERE Salary NOT BETWEEN 1500 AND 2850;

```
mysql> SELECT Ename, Salary FROM employee WHERE Salary NOT BETWEEN 1500 AND 2850;
        Salary
 Ename
 Smith
        1000.00
 Ward
        1300.00
 Martin | 1250.00
Blake
        2870.00
 Clark
         2900.00
 King
         2950.00
 Turner | 1450.00
 Adams
         1150.00
 James
           950.00
 Miller | 1300.00
10 rows in set (0.00 sec)
```

8. Query to display Employee Name and Department No. Of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.

CODE: SELECT Ename, Dno FROM employee WHERE Dno=10 OR DNO=30 ORDER BY Ename;

OUTPUT:

```
mysql> SELECT Ename,Dno FROM employee WHERE Dno=10 OR DNO=30 ORDER BY Ename;
 Ename
         Dno
  Allan
             30
  Blake
             30
  Clark
             10
  James
             30
  King
             10
  Martin
             30
  Turner
             30
 Ward
             30
8 rows in set (0.01 sec)
```

9. Query to display Name and Hire Date of every Employee who was hired in 1981.

CODE: SELECT Ename, Hire_date FROM EMPLOYEE WHERE Hire_date LIKE '1981%';

```
mysql> SELECT Ename, Hire_date FROM EMPLOYEE WHERE Hire_date LIKE '1981%';
Ename
        | Hire_date
 Smith
         1981-12-17
 Allan
         1981-02-20
 Ward
         1981-02-22
 Jones
         1981-04-02
 Martin | 1981-04-22
Blake
         1981-05-01
Clark
         1981-06-09
 King
         1981-11-17
 Turner | 1981-09-08
         1981-12-03
 James
 Ford
         1981-12-03
11 rows in set (0.01 sec)
```

10. Query to display Name and Job of all employees who don't have a current Manager.

CODE: SELECT Ename, Job_type FROM employee WHERE Manager IS NULL;

OUTPUT:

```
mysql> SELECT Ename,Job_type FROM employee WHERE Manager IS NULL;
+----+
| Ename | Job_type |
+----+
| King | President |
+----+
| row in set (0.01 sec)
```

11. Query to display the Name, Salary and Commission for all the employees who earn commission. Sort the data in descending order of Salary and Commission.

CODE: SELECT Ename, Salary, Commission FROM employee WHERE Commission > 0.00 ORDER BY Salary DESC, Commission DESC;

OUTPUT:

```
mysql> SELECT Ename, Salary, Commission FROM employee WHERE Commission > 0.00 ORDER BY Salary DESC, Commission DESC;
+------+
| Ename | Salary | Commission |
+------+
| Allan | 2000.00 | 300.00 |
| Ward | 1300.00 | 500.00 |
| Martin | 1250.00 | 1400.00 |
+------+
3 rows in set (0.00 sec)
```

12. Query to display Name of all the employees where the third letter of their name is 'A'.

CODE: SELECT Ename FROM employee WHERE Ename LIKE '_A%';

OUTPUT:

```
mysql> SELECT Ename FROM employee WHERE Ename LIKE '__A%';
+----+
| Ename |
+----+
| Blake |
| Clark |
| Adams |
+----+
3 rows in set (0.01 sec)
```

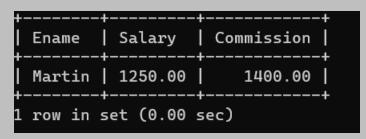
13. Query to display Name of all employees either have two 'R's or have two 'A's in their name and are either in Dept No = 30 or their Manger's Employee No = 778.

CODE: SELECT Ename, Dno, Manager FROM employee WHERE Ename LIKE '%A%A%' OR Ename LIKE '%R%R%' AND Dno=30 OR Manager='778'; OUTPUT:

14. Query to display Name, Salary and Commission for all employees whose Commission Amount is greater than their Salary increased by 5%.

CODE: SELECT Ename, Salary, Commission FROM employee WHERE Commission > (Salary+Salary*0.05);

OUTPUT:

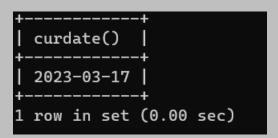


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15. Query to display the Current Date.

CODE: SELECT CURDATE();

OUTPUT:



16. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.

CODE: SELECT Ename, Hire_date, date_add(date_add(Hire_date, INTERVAL 6 MONTH), INTERVAL (7-WEEKDAY(date_add(Hire_date, INTERVAL 6 MONTH))) DAY) AS REVIEW_DATE FROM employee;

Ename			
Allan 1981-02-20 1981-08-24	+ Ename +	Hire_date	REVIEW_DATE
1	Allan Ward Jones Martin Blake Clark King Turner Adams Scott James Ford	1981-02-20 1981-02-22 1981-04-02 1981-04-22 1981-05-01 1981-06-09 1981-11-17 1981-09-08 1983-01-12 1982-12-09 1981-12-03 1981-12-03	1981-08-24 1981-08-24 1981-10-05 1981-10-26 1981-11-02 1981-12-14 1982-05-24 1982-03-15 1983-06-13 1982-06-07 1982-06-07

17. Query to display Name and calculate the number of months between today and the date each employee was hired.

CODE: SELECT Ename,12 * (YEAR(curdate())-YEAR(Hire_date)) + (MONTH(CURDATE())-MONTH(Hire_date)) AS MONTHS FROM employee; OUTPUT:

Ename	MONTHS
Smith	495
Allan	505
Ward	505
Jones	503
Martin	503
Blake	502
Clark	501
King	496
Turner	498
Adams	482
Scott	483
James	495
Ford	495
Miller	494
+	+ -
14 rows in	n set (0.00 sec)

18. Query to display the following for each employee:- <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.

CODE: SELECT CONCAT(Ename,' earns ',Salary,' monthly but wants ',3*Salary) AS DREAMY_SALARY FROM employee;

```
DREAMY_SALARY
 Smith earns 1000.00 monthly but wants 3000.00
 Allan earns 2000.00 monthly but wants 6000.00
 Ward earns 1300.00 monthly but wants 3900.00
 Jones earns 2300.00 monthly but wants 6900.00
 Martin earns 1250.00 monthly but wants 3750.00
 Blake earns 2870.00 monthly but wants 8610.00
 Clark earns 2900.00 monthly but wants 8700.00
King earns 2950.00 monthly but wants 8850.00
 Turner earns 1450.00 monthly but wants 4350.00
 Adams earns 1150.00 monthly but wants 3450.00
 Scott earns 2850.00 monthly but wants 8550.00
 James earns 950.00 monthly but wants 2850.00
 Ford earns 2600.00 monthly but wants 7800.00
 Miller earns 1300.00 monthly but wants 3900.00
14 rows in set (0.00 sec)
```

19. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with 'J', 'A' and 'M'.

CODE: SELECT CONCAT(UPPER(SUBSTRING(Ename,1,1)) , LOWER(SUBSTRING(Ename,2,50))) AS NAME,LENGTH(Ename) AS LENGTH FROM employee WHERE Ename LIKE 'J%' OR Ename LIKE 'A%' OR Ename LIKE 'M%';



20. Query to display Name, Hire Date and Day of the week on which the employee started.

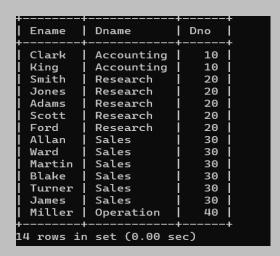
CODE: SELECT Ename, Hire_date, DAYNAME(Hire_date) AS WEEK_DAY FROM employee;

OUTPUT:

++		+	
Ename	Hire_date	WEEK_DAY	
++		+	
Smith	1981-12-17	Thursday	
Allan	1981-02-20	Friday	
Ward	1981-02-22	Sunday	
Jones	1981-04-02	Thursday	
Martin	1981-04-22	Wednesday	
Blake	1981-05-01	Friday	
Clark	1981-06-09	Tuesday	
King	1981-11-17	Tuesday	
Turner	1981-09-08	Tuesday	
Adams	1983-01-12	Wednesday	
Scott	1982-12-09	Thursday	
James	1981-12-03	Thursday	
Ford	1981-12-03	Thursday	
Miller	1982-01-23	Saturday	
++		+	
14 rows in	set (0.00 se	ec)	

21. Query to display Name, Department Name and Department No for all the employees.

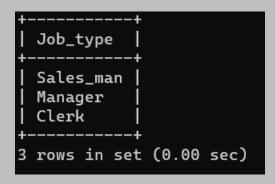
CODE: SELECT e.Ename,d.Dname,e.Dno FROM employee AS e,department AS d WHERE e.Dno=d.Dno;



22. Query to display Unique Listing of all Jobs that are in Department # 30.

CODE: SELECT DISTINCT Job_type FROM employee WHERE Dno=30;

OUTPUT:



23. Query to display Name, Dept Name of all employees who have an 'A' in their name.

CODE:

SELECT e.Ename,d.Dname FROM employee AS e,department as d WHERE e.Ename LIKE '%A%' AND e.Dno=d.Dno;

OUTPUT:

+ Ename +	 Dname
Allan Ward Martin Blake Clark Adams James	Sales Sales Sales Sales Accounting Research Sales
	++ set (0.00 sec)

24. Query to display Name, Job, Department No. And Department Name for all the employees working at the Dallas location.

<u>CODE:</u> SELECT e.Ename,e.Job_type,e.Dno,d.Dname FROM employee AS e,department as d WHERE e.Dno=d.Dno AND d.Location='Dallas';

OUTPUT:

++ Ename +	Job_type	-	++ Dname
Adams Scott	Manager Clerk Analyst Analyst	20 20 20 20	Research Research Research Research Research
5 rows in	set (0.00		++

25. Query to display Name and Employee no. Along with their Manger's Name and the Supervisor's employee no; along with the Employees' Name who do not have a Supervisor.

CODE:

SELECT e.Ename, e.Eno, d.Ename, d.Eno FROM employee AS e LEFT OUTER JOIN employee as d ON e.Eno=d.supervisor;

OUTPUT:

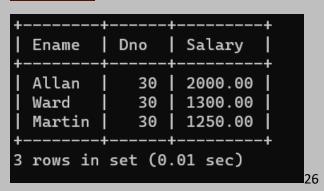
+ Ename +	Eno	Ename	+ Eno +
Smith	736	NULL	NULL
Allan	749	NULL	NULL
Ward	752	NULL	NULL
Jones	756	Scott	788
Jones	756	Ford	792
Martin	765	NULL	NULL
Blake	769	Allan	749
Blake	769	Ward	752
Blake	769	Turner	784
Blake	769	James	790
Clark	778	Adams	787
King	783	Jones	756
King	783	Blake	769
King	783	Clark	778
Turner	784	Martin	765
Adams	787	NULL	NULL
Scott	788	Miller	793
James	790	Smith	736
Ford	792	NULL	NULL
Miller	793	NULL	NULL
 		·	·+
20 rows in	set ((0.00 sec))

26. Query to display Name, Dept No. And Salary of any employee whose department No. And salary matches both the department no. And the salary of any employee who earns a commission.

CODE: SELECT Ename, Dno, Salary FROM employee WHERE

(Dno,Salary) IN (SELECT Dno,Salary FROM employee WHERE Commission>0);

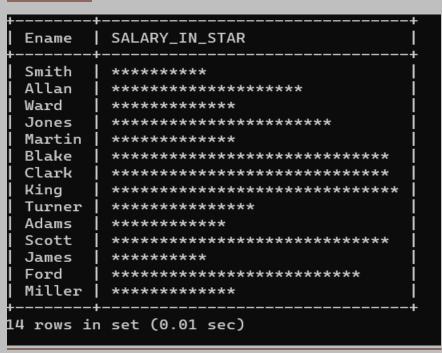
OUTPUT:



27. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.

CODE:

SELECT Ename, REPEAT ('*', (Salary/100)) AS SALARY_IN_STAR FROM employee;



28. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees

<u>CODE: SELECT</u> <u>MAX(Salary),MIN(Salary),SUM(Salary),AVG(Salary) FROM</u> <u>employee;</u>

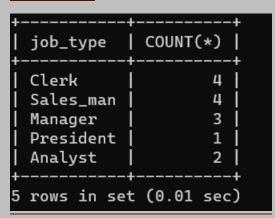
OUTPUT;

++ MAX(Salary)	MIN(Salary)	SUM(Salary)	+ AVG(Salary)
2950.00	950.00	26870.00	1919.285714
1 row in set (0	.01 sec)		·

29. Query to display the number of employees performing the same Job type functions.

CODE:

SELECT job_type,COUNT(*) FROM employee GROUP BY
Job_type;

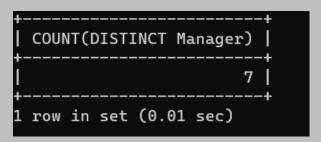


30. Query to display the no. Of managers without listing their names.

CODE:

SELECT COUNT(DISTINCT Manager) FROM employee;

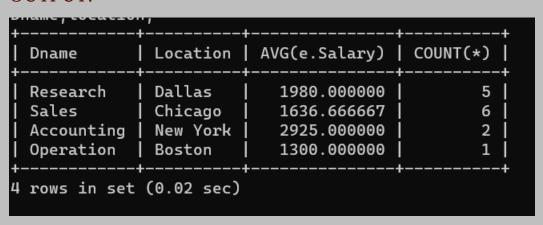
OUTPUT:



31. Query to display the Department Name, Location Name, No. Of Employees and the average salary for all employees in that department.

CODE:

SELECT d.Dname,d.Location,AVG(e.Salary),COUNT(*) FROM employee AS e,department AS d WHERE d.Dno=e.Dno GROUP BY d.Dname;

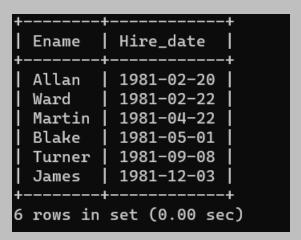


32. Query to display Name and Hire Date for all employees in the same dept. As Blake.

CODE:

SELECT Ename, Hire_date FROM employee WHERE Dno=(SELECT Dno FROM employee WHERE Ename='Blake');

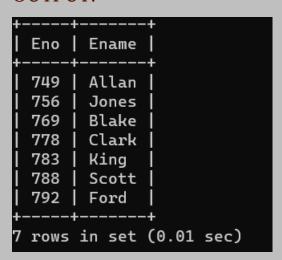
OUTPUT:



33. Query to display the Employee No. And Name for all employees who earn more than the average salary.

CODE:

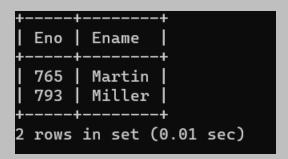
SELECT Eno,Ename FROM employee WHERE Salary > (Select AVG(Salary) FROM employee);



34. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a 'T'.

SELECT e.Eno,e.Ename FROM employee AS e ,employee as d WHERE e.Manager=d.Eno AND d.Ename LIKE '%T%';

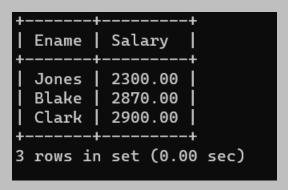
OUTPUT:



35. Query to display the names and salaries of all employees who report to King.

CODE:

SELECT Ename, Salary FROM employee WHERE Manager=(SELECT Eno FROM employee WHERE Ename='King');



36. Query to display the department no, name and job for all employees in the Sales department.

CODE:

SELECT e.Dno,e.Ename,e.Job_type FROM employee AS e,department as d WHERE d.Dno=e.Dno AND d.Dname='Sales';

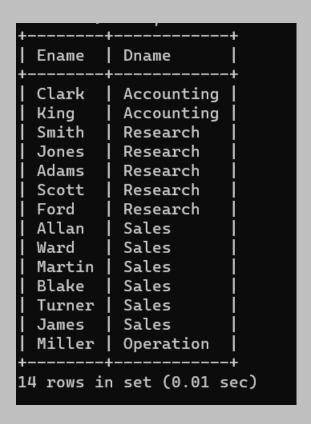
OUTPUT:

Dno		Job_type	+ -
30 30 30 30 30	Allan Ward Martin Blake Turner James	Sales_man Sales_man Sales_man Manager Sales_man Clerk	
+ 6 rows :	in set (0	.00 sec)	ł .

38. Display names of employees along with their department name who have more than 20 years experience

CODE:

SELECT Ename, Dname FROM (EMPLOYEE NATURAL JOIN DEPARTMENT) WHERE TIMESTAMPDIFF (YEAR, Hire_date, NOW()) > 20;



39. Display total number of departments at each location CODE:

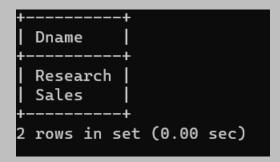
SELECT Location, COUNT(*) FROM DEPARTMENT GROUP BY Location;



40. Find the department name in which at least 20 employees work in.

CODE: SELECT Dname FROM (EMPLOYEE NATURAL JOIN DEPARTMENT) GROUP BY Dno HAVING COUNT(*) > 20;

OUTPUT:



41. Query to find the employee' name who is not supervisor and name of supervisor supervising more than 5 employees.

CODE:

(SELECT Ename FROM EMPLOYEE WHERE Eno NOT IN (SELECT DISTINCT SupervisorENo FROM EMPLOYEE WHERE SupervisorENo IS NOT NULL)

UNION

(

SELECT Ename FROM EMPLOYEE WHERE Eno IN (SELECT SupervisorENo FROM EMPLOYEE WHERE SupervisorENo IS NOT NULL GROUP BY SupervisorENo HAVING COUNT(*) > 5

```
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```

```
)
);
```

OUTPUT:

```
+----+
| Ename |
+-----+
| Smith |
| Allan |
| Ward |
| Martin |
| Adams |
| Ford |
| Miller |
+-----+
7 rows in set (0.00 sec)
```

42. Query to display the job type with maximum and minimum employees

CODE: WITH JOBCOUNT AS (SELECT COUNT(*) AS ECount FROM EMPLOYEE GROUP BY Job_type) SELECT Job_type, COUNT(*) FROM EMPLOYEE GROUP BY Job_type HAVING COUNT(*) IN (

```
( SELECT MAX(ECount) FROM JOBCOUNT
)
UNION
(
SELECT MIN(ECount) FROM JOBCOUNT)
);
```