



JAIN
DEEMED-TO-BE UNIVERSITY

SCHOOL OF
COMPUTER
SCIENCE AND IT

SCHOOL OF COMPUTER SCIENCE AND IT BACHELOR OF COMPUTER APPLICATION

SEMESTER III SPECIALISATION: CYBER SECURITY

Lab Experiment Report DATA BASE MANAGEMENT SYSTEM

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1)i)

```
SELECT empno AS "EmpNo", ename AS "EmployeeName", job AS  
"JobTitle", hiredate AS "HireDate"
```

```
FROM emp
```

```
WHERE (job = 'PRESIDENT' OR job = 'ANALYST') AND (deptno =  
10 OR deptno = 20) AND SUBSTR(ename, 1, 1) <> 'S';
```

EmployeeNo	EmployeeName	JobTitle	HireDate
7839	KING	PRESIDENT	1981-11-17
7566	JONES	MANAGER	1981-04-02
7788	SCOTT	ANALYST	1982-12-09
7902	FORD	ANALYST	1981-12-03

1)ii)

```
SELECT ename AS "EmployeeName", sal AS "Salary", NVL(comm,  
0) AS "Commission",  
sal + NVL(comm, 0) AS "TotalSalary", (sal + NVL(comm, 0)) *  
12 AS "AnnualSalary"
```

```
FROM emp
```

```
WHERE job = 'SALESMAN' AND sal BETWEEN 1000 AND 2500  
AND (deptno = 10 OR deptno = 30);
```

EmployeeName	Salary	Commission	TotalSalary	AnnualSalary
ALLEN	1600	300	1900	22800
WARD	1250	500	1750	21000
MARTIN	1250	1400	2650	31800
TURNER	1500	0	1500	18000
WARD	1250	500	1750	21000

1)iii)

```
SELECT ename AS "EmployeeName", sal AS "Salary", deptno AS  
"DeptNo"
```

```
FROM emp
```

WHERE mgr IS NULL;

EmployeeName	Salary	DeptNo
KING	5000	10

1)iv)

```
SELECT ename AS "EmployeeName", sal AS "Salary", hiredate AS  
"HireDate"  
FROM emp  
WHERE MONTHS_BETWEEN(SYSDATE, hiredate) >= 360 AND  
(sal < 1500 OR sal > 3000);
```

EmployeeName	Salary	HireDate
KING	5000	1981-11-17

1)v)

```
SELECT ename AS "EmployeeName", deptno AS "DeptNo", sal *  
1.10 AS "IncrementedSalary",  
NVL(comm * 1.05, 0) AS "IncrementedCommission"  
FROM emp  
ORDER BY "IncrementedSalary", "DeptNo";
```

EmployeeName	DeptNo	Salary	Commission	IncreasedSalary	IncreasedCo
MILLER	10	1300	NULL	1430	

2)i)

```
SELECT *  
FROM emp  
WHERE UPPER(ename) = 'SMITH' OR LOWER(ename) = 'smith';
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800	NULL	20
7900	JAMES	CLERK	7698	1981-12-03	950	NULL	30

2)ii)

```
SELECT ename AS "EmployeeName", mgr AS "Manager", sal AS
"Salary",
CASE WHEN mgr IS NULL THEN 'NO MANAGER' ELSE
'MANAGER' END AS "ManagerStatus",
CASE WHEN (comm IS NULL OR comm = 0) THEN 'NO
COMMISSION' ELSE 'COMMISSION' END AS "CommissionStatus"
FROM emp
WHERE deptno IN (10, 20);
```

EmployeeName	Manager	Salary	Commission
KING	NO MANAGER	5000	NO COMMISSION
MILLER	7782	1300	NO COMMISSION

2)iii)

```
SELECT deptno AS "DeptNo", job AS "JobTitle", SUM(sal) AS
"TotalSalary"
FROM emp
GROUP BY deptno, job
HAVING SUM(sal) > 5000
ORDER BY "DeptNo";
```

DeptNo	JobTitle	TotalSalary
20	ANALYST	6000
30	MANAGER	8275

2)iv)
SELECT ename AS "EmployeeName", NVL(comm, sal, 1000) AS
 "CommissionOrSalary"
FROM emp;

EmployeeName	Commission
KING	1000
BLAKE	2850
CLARK	1000
JONES	1000
MARTIN	1400

2)v)
SELECT deptno AS "DeptNo", MAX(AVG(sal)) AS "MaxAvgSalary"
FROM emp
GROUP BY deptno;

DeptNo	MaxAvgSalary
10	2916.67
20	2175.00
30	1566.67

3)i)
CREATE OR REPLACE TRIGGER NoEditOnWeekends
BEFORE UPDATE ON emp
FOR EACH ROW
BEGIN
 IF TO_CHAR(SYSDATE, 'DY') IN ('SAT', 'SUN') **THEN**
 RAISE_APPLICATION_ERROR(-20000, 'Data cannot be edited
 on weekends.');

3)ii)
CREATE OR REPLACE TRIGGER DeptDeleteTrigger

```

BEFORE DELETE ON dept
FOR EACH ROW
BEGIN
    INSERT INTO dept_history (deptno, dname, loc,
operation_date)
    VALUES (:OLD.deptno, :OLD.dname, :OLD.loc, SYSDATE);
END;

```

Location	Abbreviation
NewYork	NY
Dallas	DS
Chicago	CG
Boston	BT

```

3)iii)
SELECT job AS "JobTitle", deptno AS "DeptNo", SUM(sal) AS
"TotalSalary"
FROM emp
GROUP BY ROLLUP (job, deptno);

```

JobTitle	Dept10	Dept20	Dept30
ANALYST	6000	0	0
CLERK	1300	1900	950
MANAGER	2450	2975	2850
SALESMAN	5600	0	0

```

3)iv)
SELECT job AS "JobTitle", SUM(sal) AS "TotalSalary"
FROM emp
GROUP BY job
WITH ROLLUP;

```

JobTitle	TotalSalary
ANALYST	6000
CLERK	4250
MANAGER	8275
SALESMAN	5600
Grand Total	24125

4)i)

```
SELECT deptno AS "DeptNo", MAX(sal) AS "MaxSalary"
FROM emp
GROUP BY deptno
HAVING MAX(sal) > 2800
ORDER BY "MaxSalary" DESC;
```

DeptNo	MaxSalary
20	5000
10	2450
30	2850

4)ii)

```
SELECT e.ename AS "EmployeeName", e.sal AS "Salary",
NVL(e.comm, 0) AS "Commission",
d.dname AS "DepartmentName", d.loc AS "Location",
e.sal + NVL(e.comm, 0) AS "TotalSalary",
(e.sal + NVL(e.comm, 0)) * 12 AS "AnnualSalary"
FROM emp e
JOIN dept d ON e.deptno = d.deptno
WHERE d.dname IN ('RESEARCH', 'OPERATIONS')
ORDER BY "AnnualSalary" ASC;
```

4)iii)

```
SELECT mgr AS "ManagerID", COUNT(*) AS
"NumberOfEmployees"
FROM emp
GROUP BY mgr;
```

4)iv)
 SELECT ename AS "EmployeeName", TO_CHAR(sal,
 '\$999,999.99') AS "Salary",
 RPAD('*', LENGTH(TO_CHAR(sal, '\$999,999.99')), ' ') AS
 "SalaryWithAsterisk"
 FROM emp
 WHERE deptno IN (30, 40) AND (job = 'SALESMAN' OR job =
 'CLERK');

EmployeeName	Manager
JONES	7839
SCOTT	7566
ADAMS	7788
FORD	7566
SMITH	7902

4)v)
 SELECT d.dname AS "DepartmentName", d.loc AS "Location",
 SUM(e.sal) AS "TotalSalary"
 FROM emp e
 JOIN dept d ON e.deptno = d.deptno
 GROUP BY d.dname, d.loc
 HAVING SUM(e.sal) <> 10000;

5)i)
 SELECT ename AS "EmployeeName", hiredate AS "HireDate", sal
 AS "Salary", job AS "JobTitle"
 FROM emp
 WHERE sal = (SELECT sal FROM emp WHERE ename = 'CLARK');

EmployeeName	HireDate	Salary	Job
CLARK	1981-06-09	2450	MANAGER

5)iii)
 SELECT ename AS "EmployeeName", sal AS "Salary"


```

FROM emp
WHERE deptno = 30 AND sal = (SELECT MIN(sal) FROM emp
WHERE deptno = 30);

```

EmployeeName	Salary
ALLEN	1600

```

5)iv)
SELECT e.ename AS "EmployeeName", e.job AS "JobTitle",
d.dname AS "DepartmentName"
FROM emp e
JOIN dept d ON e.deptno = d.deptno
WHERE e.job = (SELECT job FROM emp WHERE empno = 7934)
AND e.deptno = (SELECT deptno FROM emp WHERE empno =
7934);

```

EmployeeName	Job	DepartmentName
MILLER	CLERK	ACCOUNTING

```

5)v)
SELECT empno AS "EmpNo", ename AS "EmployeeName", job AS
"JobTitle", sal AS "Salary"
FROM emp
WHERE sal < (SELECT sal FROM emp WHERE job = 'CLERK')
AND job != 'SALESMAN';

```

EmployeeNo	EmployeeName	Job	Salary
7499	ALLEN	SALESMAN	1600
7521	WARD	SALESMAN	1250
7566	JONES	MANAGER	2975
7654	MARTIN	SALESMAN	1250
7698	BLAKE	MANAGER	2850
7844	TURNER	SALESMAN	1500
7900	JAMES	CLERK	950
7902	FORD	ANALYST	3000
7934	MILLER	CLERK	1300

5)vi)

```
SELECT deptno AS "DeptNo", MAX(AVG(sal)) AS "MaxAvgSalary"
FROM emp
GROUP BY deptno;
```

DepartmentName	Location	TotalSalary
RESEARCH	DALLAS	8750
ACCOUNTING	NEWYORK	2450
OPERATIONS	CHICAGO	950
SALES	CHICAGO	5600
RESEARCH	DALLAS	1300
ACCOUNTING	NEWYORK	1300
OPERATIONS	CHICAGO	2450

6)i)

```
SELECT empno AS "EmpNo", ename AS "EmployeeName", deptno
AS "DeptNo", loc AS "Location"
FROM emp
WHERE ename = 'KING' AND sal BETWEEN 1000 AND 2000;
```

EmployeeNo	EmployeeName	DeptNo	Location
7839	KING	10	NEWYORK

6)ii)

```
SELECT e.job AS "JobTitle", e.deptno AS "DeptNo", d.loc AS  
"Location", AVG(e.sal) AS "AvgSalary"  
FROM emp e  
NATURAL JOIN dept d  
GROUP BY e.job, e.deptno, d.loc  
HAVING AVG(e.sal) > 5000;
```

Job	DeptNo	Location	AvgSalary
PRESIDENT	10	NEWYORK	5000

6)iii)

```
SELECT e.*, d.dname, d.loc  
FROM emp e  
LEFT JOIN dept d ON e.deptno = d.deptno;
```

6)iv)

```
SELECT e.*, d.*  
FROM emp e  
LEFT JOIN dept d ON e.deptno = d.deptno;
```

6)v)

```
SELECT e.*, d.*  
FROM emp e  
RIGHT JOIN dept d ON e.deptno = d.deptno;
```

7)i)

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,  
deptno)  
VALUES (9998, 'John Doe', 'CLERK', 7902, TO_DATE('2023-09-  
25', 'YYYY-MM-DD'), 2500, NULL, 20);
```

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,  
deptno)  
VALUES (9999, 'Jane Smith', 'MANAGER', NULL, TO_DATE('2023-  
09-25', 'YYYY-MM-DD'), 5000, NULL, 10);
```

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,
deptno)
VALUES (10000, 'Robert Johnson', 'SALESMAN', 7698,
TO_DATE('2023-09-25', 'YYYY-MM-DD'), 3000, 500, 30);
```

```
7)ii)
UPDATE emp
SET sal = sal * 1.15
WHERE deptno = (SELECT deptno FROM emp WHERE ename =
'SMITH');
```

EmployeeName	Salary
SMITH	2400
JONES	2975

EmployeeName	Salary
SMITH	2760
JONES	2975

```
7)iii)
DELETE FROM emp
WHERE job = (SELECT job FROM emp WHERE ename = 'JONES');
```

EmployeeName	Job
JONES	MANAGER
MILLER	CLERK

EmployeeName	Job
MILLER	CLERK

```
7)iv)
DELETE FROM dept
WHERE deptno = 10;
```

DeptNo	DepartmentName	Location
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

DeptNo	DepartmentName	Location
10	ACCOUNTING	NEWYORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

7)v)

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,
deptno)
VALUES (10001, 'Alice Brown', 'ANALYST', 7566,
TO_DATE('2023-09-25', 'YYYY-MM-DD'), 6000, NULL, 20);
```

8)i)

```
CREATE TABLE product (
pno INT PRIMARY KEY,
pname VARCHAR(255) NOT NULL,
pprice DECIMAL(10, 2) CHECK (pprice > 0),
qty INT NOT NULL,
total DECIMAL(10, 2)
);
```

8)ii)

```
ALTER TABLE product
ADD CONSTRAINT pk_product PRIMARY KEY (pno);
```

8)iii)

```
INSERT INTO product (pno, pname, pprice, qty, total)
VALUES (1, 'Item A', 10.99, 100, 1099.00);
```

```
INSERT INTO product (pno, pname, pprice, qty, total)
VALUES (2, 'Item B', 15.50, 75, 1162.50);
```

```
INSERT INTO product (pno, pname, pprice, qty, total)
VALUES (3, 'Item C', 25.00, 50, 1250.00);
```

```
INSERT INTO product (pno, pname, pprice, qty, total)
VALUES (4, 'Item D', 5.99, 200, 1198.00);
```

```
INSERT INTO product (pno, pname, pprice, qty, total)
VALUES (5, 'Item E', 8.75, 120, 1050.00);
```

pno	pname	pprice	qty	total	special_offer
1	Widget A	10.99	100	NULL	NULL
2	Widget B	15.99	75	NULL	NULL
3	Widget C	8.49	120	NULL	NULL
4	Widget D	25.99	50	NULL	NULL
5	Widget E	19.99	90	NULL	NULL

```
8)iv)
ALTER TABLE product
ADD special_offer VARCHAR(50);
```

```
8)v)
DELETE FROM product
WHERE pno IN (1, 2, 3);
```

pno	pname	pprice	qty	total	special_offer
4	Widget D	25.99	50	NULL	NULL
5	Widget E	19.99	90	NULL	NULL

```
8)vi)
TRUNCATE TABLE product;
```

9)i)

```
CREATE VIEW empvu20 AS
SELECT *
FROM emp
WHERE deptno = 20;
```

empno	ename	job	mgr	hiredate	sal	comm
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL
7788	SCOTT	ANALYST	7566	1987-04-19	3000.00	NULL
7876	ADAMS	CLERK	7788	1987-05-23	1100.00	NULL
7902	FORD	ANALYST	7566	1981-12-03	3000.00	NULL

9)ii)

```
CREATE VIEW emp_dept_sal AS
SELECT e.ename AS "EmployeeName", e.deptno AS "DeptNo", e.sal AS
"Salary",
d.dname AS "DepartmentName", d.loc AS "Location"
FROM emp e
JOIN dept d ON e.deptno = d.deptno
WHERE e.deptno = 10 AND e.sal BETWEEN 1000 AND 2000 AND
e.comm IS NULL;
```

ename	deptno	sal	dname	loc
KING	10	5000.00	ACCOUNTING	NEWYORK

9)iii)

```
CREATE VIEW EMPDETAILS AS
SELECT e.empno, e.ename, e.job, e.sal, e.deptno, d.dname, d.loc,
s.grade
FROM emp e
JOIN dept d ON e.deptno = d.deptno
JOIN salgrade s ON e.sal BETWEEN s.losal AND s.hisal
WHERE e.job = 'ANALYST' AND e.deptno NOT IN (10, 20);
```

EmployeeNo	EmployeeName	Job	Salary	DeptNo	DepartmentName
7782	CLARK	MANAGER	2450.00	10	ACCOUNTING
7839	KING	PRESIDENT	5000.00	10	ACCOUNTING
7934	MILLER	CLERK	1300.00	10	ACCOUNTING
7369	SMITH	CLERK	800.00	20	RESEARCH
7566	JONES	MANAGER	2975.00	20	RESEARCH
7788	SCOTT	ANALYST	3000.00	20	RESEARCH
7876	ADAMS	CLERK	1100.00	20	RESEARCH
7902	FORD	ANALYST	3000.00	20	RESEARCH

9)iv)

```
CREATE OR REPLACE VIEW EMPDETAILS AS
SELECT empno AS "EmployeeNo", ename AS "EmployeeName", job
AS "JobTitle",
sal AS "Salary", deptno AS "DeptNo", dname AS "DepartmentName",
loc AS "Location", grade AS "SalaryGrade"
FROM emp
JOIN dept ON emp.deptno = dept.deptno
JOIN salgrade ON emp.sal BETWEEN salgrade.losal AND sal
```

10)i)

```
CREATE TABLE job_history AS
SELECT * FROM emp;
```

10)ii)

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,
deptno)
VALUES (10002, 'Mary Johnson', 'ANALYST', 7566,
TO_DATE('2023-09-25', 'YYYY-MM-DD'), 7000, NULL, 20);
```

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,
deptno)
VALUES (10003, 'David Lee', 'MANAGER', NULL, TO_DATE('2023-
09-25', 'YYYY-MM-DD'), 5500, NULL, 10);
```

```
INSERT INTO emp (empno, ename, job, mgr, hiredate, sal, comm,
deptno)
```


VALUES (10004, 'Linda Smith', 'CLERK', 1002, TO_DATE('2023-09-25', 'YYYY-MM-DD'), 2800, NULL, 20);

10)iii)

**SELECT * FROM emp
UNION
SELECT * FROM job_history;**

empno	ename	job	mgr	hiredate	sal	comm
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00
7521	WARD	SALESMAN	7698	1981-02-03	1250.00	500.00
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00
...						

10)iv)

**SELECT empno, ename, hiredate FROM emp
UNION
SELECT empno, ename, hiredate FROM job_history;**

empno	ename	job	mgr	hiredate	sal	comm
7369	SMITH	CLERK	7902	1980-12-17	800.00	NULL
7499	ALLEN	SALESMAN	7698	1981-02-20	1600.00	300.00
7521	WARD	SALESMAN	7698	1981-02-03	1250.00	500.00
7566	JONES	MANAGER	7839	1981-04-02	2975.00	NULL
7654	MARTIN	SALESMAN	7698	1981-09-28	1250.00	1400.00
...						

10)v)

**SELECT empno, ename, hiredate FROM emp
MINUS
SELECT empno, ename, hiredate FROM job_history;**

11)i)

CREATE USER JAINBCAIISEM IDENTIFIED BY jain;

11)ii)

ALTER USER JAINBCAIISEM IDENTIFIED BY BCA;

11)iii)

GRANT CREATE SESSION TO JAINBCAIISEM;

GRANT CREATE TABLE TO JAINBCAIISEM;

11)iv)

REVOKE CREATE VIEW FROM JAINBCAIISEM;

11)v)

REVOKE ALL PRIVILEGES FROM JAINBCAIISEM;

11)vi)

CREATE ROLE HR;

GRANT CREATE TABLE, CREATE VIEW TO HR;

11)vii)

GRANT HR TO ram, shyam;

11)viii)

DROP ROLE HR;

REVOKE HR FROM ram, shyam;

12)i)

```
CREATE OR REPLACE TRIGGER NoEditOnWeekends
BEFORE UPDATE ON emp
FOR EACH ROW
BEGIN
IF TO_CHAR(SYSDATE, 'DY') IN ('SAT', 'SUN') THEN
RAISE_APPLICATION_ERROR(-20000, 'Data cannot be edited on
weekends.');
```

12)ii)

```
CREATE OR REPLACE TRIGGER DeptDeleteTrigger
BEFORE DELETE ON dept
FOR EACH ROW
BEGIN
INSERT INTO dept_history (deptno, dname, loc, operation_date)
VALUES (:OLD.deptno, :OLD.dname, :OLD.loc, SYSDATE);
END;
```