

DATABASE MANAGEMENT SYSTEM LAB MANUAL

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SECTION: A



Lab 01

- Q1: SELECT FIRST_NAME AS 'First Name', LAST_NAME AS 'Last Name' FROM employees;
- Q2: SELECT DISTINCT DEPARTMENT_ID FROM employees;
- Q3: SELECT * FROM employees ORDER BY FIRST_NAME DESC;
- Q4: SELECT EMPLOYEE_ID, FIRST_NAME, LAST_NAME FROM EMPLOYEES ORDER BY SALARY ASC;
- Q5: SELECT SUM(SALARY) FROM employees;
- Q6: SELECT MIN(SALARY), MAX(SALARY) FROM employees;
- Q7: SELECT COUNT(SALARY), AVG(SALARY) FROM employees;
- **08: SELECT COUNT(DISTINCT JOB ID) FROM EMPLOYEES:**
- Q9: SELECT UPPER(FIRST_NAME) FROM employees;
- Q10: SELECT * FROM EMPLOYEES LIMIT 10;
- Q11: SELECT * FROM EMPLOYEES LIMIT 3,2;
- Q12: SELECT * FROM EMPLOYEES ORDER BY EMPLOYEE_ID DESC LIMIT 1,1;

Lab 02

- 1.SELECT EMPLOYEE ID, FIRST NAME, SALARY FROM employees WHERE SALARY < 3000;
- 2.SELECT FIRST_NAME, LAST_NAME FROM employees WHERE FIRST_NAME LIKE 'A%';
- 3.SELECT FIRST_NAME, JOB_ID, DEPARTMENT_ID FROM employees WHERE JOB_ID = 'PU_CLERK' OR MANAGER_ID = 114;
- 4.SELECT EMPLOYEE_ID, FIRST_NAME, SALARY FROM employees WHERE SALARY >= 1500 AND SALARY <= 3000;
- 5.SELECT EMPLOYEE_ID, FIRST_NAME, SALARY FROM employees WHERE COMMISSION_PCT = 0;
- 6.SELECT FIRST_NAME FROM employees WHERE FIRST_NAME LIKE '%N';
- 7.SELECT FIRST_NAME, JOB_ID, DEPARTMENT_ID FROM employees WHERE JOB_ID != 'PU_CLERK';
- 8.SELECT EMPLOYEE_ID, FIRST_NAME, SALARY FROM employees WHERE NOT SALARY IN(3300,3200,2200);
- 9.SELECT FIRST_NAME FROM employees WHERE FIRST_NAME LIKE 'A%N';
- 10.SELECT FIRST_NAME FROM employees WHERE FIRST_NAME LIKE '%LA%';
- 11.SELECT EMPLOYEE_ID, FIRST_NAME, SALARY FROM employees ORDER BY SALARY DESC;



12.SELECT FIRST_NAME FROM employees WHERE FIRST_NAME LIKE '_a%';

13.SELECT EMPLOYEE_ID, FIRST_NAME, SALARY FROM employees WHERE SALARY NOT BETWEEN 1500 AND 3000;

14.SELECT FIRST_NAME, LAST_NAME, DEPARTMENT_ID FROM employees WHERE DEPARTMENT_ID = 30 OR DEPARTMENT_ID = 100 ORDER BY DEPARTMENT_ID ASC;

15.SELECT FIRST_NAME, LAST_NAME, SALARY FROM employees WHERE NOT (SALARY BETWEEN 10000 AND 15000) AND (DEPARTMENT_ID <> 30 AND DEPARTMENT_ID <> 100);

16.SELECT FIRST_NAME, LAST_NAME, HIRE_DATE FROM employees WHERE YEAR(HIRE_DATE) = 1987;

17.SELECT LAST_NAME FROM employees WHERE LAST_NAME LIKE '_____';

18.SELECT FIRST_NAME, SALARY, SALARY*0.15 FROM EMPLOYEES;

19.SELECT FIRST_NAME, SALARY, COMMISSION_PCT*SALARY FROM EMPLOYEES;

20.SELECT FIRST_NAME, SALARY, SALARY-500 FROM EMPLOYEES;

Lab 03

Q1: SELECT CONCAT(LEFT(FIRST_NAME,3),RIGHT(JOB_ID,3)) FROM employees;

Q2: SELECT REPLACE(JOB_ID,'E','A') FROM employees;

Q3: SELECT FIRST_NAME, YEAR(HIRE_DATE) FROM employees;

Q4: SELECT FIRST_NAME,DATE_FORMAT(HIRE_DATE,'%M%d%Y') FROM EMPLOYEES WHERE HIRE_DATE<"1987-7-30";

Q5: SELECT ADDDATE(CURRENT_DATE(),INTERVAL -3 MONTH);

Q6: SELECT DAY(CURRENT DATE());

Q7: SELECT DATE_FORMAT(CURRENT_DATE(), '%M %d, %Y');

Q8: SELECT DATE_FORMAT(CURRENT_DATE(), '%W %M %Y');

Q9: SELECT FIRST_NAME,HIRE_DATE FROM EMPLOYEES WHERE HIRE_DATE BETWEEN '1987-06-01' AND '1987-7-30';

Q10: SELECT DATE FORMAT(CURRENT DATE(), '%d/%m/%Y');

Q11: SELECT FIRST_NAME, LAST_NAME FROM employees WHERE MONTH(HIRE_DATE) LIKE '7';

012: SELECT CONCAT(EMAIL, '@iba-suk.edu.pk') FROM employees:

Q13: SELECT EMPLOYEE_ID, FIRST_NAME, MID(HIRE_DATE, 6,2) FROM employees;

Q14: SELECT RIGHT(PHONE_NUMBER,4) FROM employees;



- Q15: SELECT RIGHT(STREET_ADDRESS,INSTR(REVERSE(STREET_ADDRESS),' ')) FROM locations;
- Q16: SELECT MIN(STREET_ADDRESS) FROM locations;
- Q17: SELECT LEFT(JOB_TITLE, INSTR(JOB_TITLE, '')) FROM JOBS;
- Q18: SELECT LENGTH(FIRST_NAME) FROM employees WHERE LAST_NAME LIKE '_C%';

Lab 04

- Q1: SELECT COUNT(*), DEPARTMENT_ID FROM EMPLOYEES GROUP BY DEPARTMENT_ID;
- Q2: SELECT DEPARTMENT_ID FROM EMPLOYEES GROUP BY DEPARTMENT_ID HAVING COUNT(DEPARTMENT_ID)>=5;
- Q3: SELECT * FROM EMPLOYEES GROUP BY FIRST_NAME;
- Q4: SELECT FIRST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP '^....\$';
- Q5: SELECT FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP 'LA' OR LAST_NAME REGEXP 'LA';
- Q6: SELECT FIRST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP '^A[A-Z]*N\$';
- Q7: SELECT FIRST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP '^[A-Z]*N\$';
- Q8: SELECT FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP '^A[A-Z]*\$';
- Q9: SELECT COUNT(*) FROM EMPLOYEES GROUP BY JOB_ID;
- Q10: SELECT MANAGER_ID, MIN(SALARY) FROM EMPLOYEES WHERE MANAGER_ID <> 0 AND SALARY>2000 ORDER BY SALARY DESC;
- Q11: SELECT COUNT(*) FROM EMPLOYEES WHERE COMMISSION_PCT = 0;
- Q12: SELECT FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE FIRST_NAME REGEXP '^[t]';

Lab 05

- 1. SELECT first_name, last_name, department_id, department_name FROM employees INNER JOIN departments USING(department_id);
- 2. SELECT first_name, last_name, job_id, department_id, department_name FROM employees JOIN departments USING(department_id) JOIN locations USING(location_id) WHERE city= 'London';
- 3. SELECT first_name, last_name, department_name, city, state_province FROM employees JOIN departments USING(department_id) JOIN locations USING(location_id);
- 4. SELECT EMPLOYEE_ID, LAST_NAME 'EMPLOYEE', MANAGER_ID, LAST_NAME 'MANAGER' FROM EMPLOYEES;



- 5. SELECT FIRST_NAME, LAST_NAME, HIRE_DATE FROM EMPLOYEES WHERE HIRE_DATE > (SELECT HIRE_DATE FROM EMPLOYEES WHERE LAST_NAME='Jones');
- 6. SELECT department_name, COUNT(*) FROM departments INNER JOIN employees USING(department_id) GROUP BY department_name;
- 7. SELECT department_id, department_name, first_name 'Manager_name' FROM departments inner join employees using(department_id);
- 8. SELECT DEPARTMENT_NAME, FIRST_NAME 'MANAGER_NAME', CITY FROM EMPLOYEES INNER JOIN DEPARTMENTS USING(DEPARTMENT_ID) INNER JOIN LOCATIONS USING(LOCATION_ID);
- 9. SELECT * FROM job_history JOIN employees USING(employee_id) WHERE salary > 10000;
- 10. SELECT first_name, last_name, hire_date, salary, (DATEDIFF(now(), hire_date))/365 Experience FROM departments JOIN employees USING(manager_id) WHERE (DATEDIFF(now(), hire_date))/365>15;
- 11. SELECT department_name, AVG(salary), COUNT(*) FROM departments JOIN employees USING (department_id) WHERE COMMISSION_PCT=0 GROUP BY department_name;
- 12. SELECT country_name,city, department_name FROM countries JOIN locations USING (country_id) JOIN departments USING (location_id);
- 13. SELECT department_name, CONCAT(first_name, '', last_name) AS name_of_manager FROM departments JOIN employees USING(manager_id);
- 14. SELECT * FROM jobs JOIN employees USING(job_id) WHERE salary >= 12000;
- 15. SELECT CONCAT(first_name, '', last_name) AS Employee_name, salary FROM employees JOIN departments USING(department_id) JOIN locations USING (location_id) WHERE city = 'London';
- 16. SELECT job_title, first_name, salary-min_salary FROM employees NATURAL JOIN jobs;
- 17. SELECT job_title, AVG(salary) FROM employees NATURAL JOIN jobs GROUP BY job_title;
- 18. SELECT employee_id, job_title, end_date-start_date Days FROM job_history NATURAL JOIN jobs WHERE department_id=90;

Lab 06

- 1.SELECT FIRST_NAME, SALARY FROM EMPLOYEES WHERE SALARY > (SELECT SALARY FROM EMPLOYEES WHERE EMPLOYEE_ID=103);
- 2.SELECT * FROM DEPARTMENTS WHERE DEPARTMENT_NAME='Sales' OR DEPARTMENT_NAME='IT';
- 2.select * from employees join departments using(department_id) where department_name in('Sales', 'IT');



3.SELECT FIRST_NAME, LAST_NAME, SALARY, DEPARTMENT_ID FROM EMPLOYEES WHERE SALARY = ANY(SELECT AVG(SALARY) FROM EMPLOYEES GROUP BY DEPARTMENT_ID);

4.SELECT FIRST_NAME, LAST_NAME, HIRE_DATE FROM EMPLOYEES WHERE LAST_NAME <> 'Fox' GROUP BY DEPARTMENT_ID;

5.SELECT FIRST_NAME, LAST_NAME, EMPLOYEE_ID FROM EMPLOYEES NATURAL JOIN LOCATIONS WHERE CITY='London';

6.SELECT EMPLOYEE_ID, FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE FIRST_NAME LIKE '%Z%' GROUP BY DEPARTMENT_ID;

7.SELECT FIRST_NAME, LAST_NAME FROM EMPLOYEES WHERE SALARY > (SELECT SUM(SALARY)/2 FROM EMPLOYEES GROUP BY DEPARTMENT ID);

8.SELECT * FROM EMPLOYEES WHERE EMPLOYEE_ID IN(SELECT MANAGER_ID FROM EMPLOYEES);

8.SELECT * FROM EMPLOYEES WHERE EMPLOYEE_ID = ANY(SELECT MANAGER_ID FROM EMPLOYEES);

9.SELECT EMPLOYEE_ID, FIRST_NAME, LAST_NAME, SALARY, DEPARTMENT_NAME, CITY FROM EMPLOYEES NATURAL JOIN DEPARTMENTS NATURAL JOIN LOCATIONS WHERE SALARY > ALL(SELECT SALARY FROM EMPLOYEES NATURAL JOIN JOB_HISTORY WHERE START_DATE BETWEEN 1990-01-01 AND 1991-12-31);

10.SELECT * FROM DEPARTMENTS WHERE DEPARTMENT_ID NOT IN (SELECT DEPARTMENT_ID FROM EMPLOYEES);

11.SELECT * FROM JOBS NATURAL JOIN LOCATIONS WHERE JOB_ID='ST_CLERK' OR JOB_ID='SA_REP' OR JOB_ID='AD_ASST' AND CITY='Seattle';

12.SELECT * FROM EMPLOYEES a, EMPLOYEES b WHERE a.MANAGER_ID = b.EMPLOYEE_ID AND a.SALARY;

13.

14.SELECT * FROM DEPARTMENTS NATURAL JOIN EMPLOYEES WHERE SALARY >= 8000;

15.SELECT CONCAT(FIRST_NAME,' ',LAST_NAME) AS MANAGER_NAME FROM EMPLOYEES WHERE EMPLOYEE_ID IN (SELECT MANAGER_ID FROM EMPLOYEES GROUP BY MANAGER_ID HAVING COUNT(*)>=4);

Lab 07

1. CREATE TABLE EMPLOYEES_REPLICA(EMPLOYEE_ID INT(3), FIRST_NAME VARCHAR(10), LAST_NAME VARCHAR(10), EMAIL VARCHAR(15), PHONE_NUMBER INT(12), HIRE_DATE INT(15), JOB_ID INT(10), SALARY INT(10), COMMISSION_PCT INT(10), MANAGER_ID INT(10), DEPARTMENT_ID INT(10));



- 2. ALTER TABLE employees_replica add(Address varchar(20));
- 3. ALTER TABLE employees_replica drop Address;
- 4. ALTER TABLE employees_replica add(House_No varchar(20), Street_No varchar(20), Area int(20), City varchar(15));
- 5. ALTER TABLE EMPLOYEES_REPLICA MODIFY COLUMN HOUSE_No INT(20);
- 6. CREATE DATABASE TEMP;
- 6.1 CREATE TABLE FACULTY (FACULTY_ID INTEGER, FACULTY_NAME VARCHAR(25) PRIMARY KEY(FACULTY_ID));
- 6.2 CREATE TABLE COURSE (COURSE_ID VARCHAR(8), COURSE_NAME VARCHAR(15));
- 6.3 CREATE TABLE CLASS (CLASS_ID VARCHAR(8), COURSE_ID VARCHAR(8), SECTION_NO INT(10), SEMESTER VARCHAR(10));
- 6.4 CREATE TABLE STUDENT (STUDENT_ID INT(10), STUDENT_NAME VARCHAR(25), FACULTY_ID INT(10) PRIMARY KEY(STUDENT_ID), FOREIGN KEY (FACULTY_ID));
- 7. ALTER TABLE STUDENT ADD(CLASS VARCHAR(20));
- 8. ALTER TABLE DEPARTMENT RENAME TO DEPT:
- 8. RENAME TABLE DEPARTMENT TO DEPT;
- 9. ALTER TABLE LOCATIONS ADD(REGION ID INT(10));
- 10. ALTER TABLE LOCATIONS CHANGE COLUMN STATE_PROVINCE STATE VARCHAR(20);

Lab 08

- 1. create table DEPARTMENT(DEPTNO numeric Primary key, DNAME varchar(10), LOC varchar(10));
- 2. create table Employee(EMPNO numeric Primary key, ENAME varchar(10), SAL numeric, DEPTNO numeric, foreign key (DEPTNO) references department (DEPTNO));
- 3. Alter table Employee add check(ENAME REGEXP '[A-Z]');
- 4. Alter table department modify DNAME varchar(10) NOT NULL;
- 5. Alter table Employee modify SAL numeric unique;

OR

- 5. ALTER TABLE EMPLOYEE ADD UNIQUE(SAL);
- 6. Alter table Employee add foreign key(DEPTNO) references department(DEPTNO) ON UPDATE CASCADE ON DELETE SET NULL;



Lab 09

1.

INSERT INTO projects (project_id, name, start_date, end_date) values(1,'AI for Marketing','2019-08-01','2019-12-29'),

(2,'ML for sales','2019-05-15','2019-11-20'),(3,'CS for IT','2020-01-01','2020-05-20'), (4,'SQL for input','2020-06-13','2020-11-20');

INSERT INTO student (std_NO, std_Name, Department, email, phone, project_id) values ('S100','Ali Mehmood','Admisnistration','ali@iba-suk.edu.pk','0333-895311',3), ('S101','Manisha Kataria','Computer Science','manisha@iba-suk.edu.pk','0345-111333444',2), ('S102','Sagar Sanjay','Engineering','sagar@iba-suk.edu.pk','0300-22224454',2), ('S103','Sara Shaikh','IT','sara@iba-suk.edu.pk','0300-111110000',3);

- 2. DELETE FROM projects;
- INSERT INTO projects SELECT * FROM project_copy;
- 4. UPDATE projects SET Start date='2023-02-01' WHERE name='CS for IT';
- 5. UPDATE projects SET cost=90000 WHERE cost=NULL;
- 6. UPDATE student join projects USING(project_id) SET daysToComplete=DATEDIFF(start_date,end_date);

Lab 10

1.

DELIMITER \$\$

CREATE PROCEDURE DISPLAY()

BEGIN

SELECT employee_id, concat(first_name," ",last_name) as Employee_Name, salary

FROM employees

WHERE department_id=10;

END\$\$



DELIMITER;
2.
DELIMITER \$\$
CREATE PROCEDURE DISPLAY2(IN DEPTNO decimal(4,0),OUT DEPTNAME varchar(30), OUT TotalSalary decimal(8,0))
BEGIN
SELECT department_name, sum(salary)
FROM departments join employees using(department_id);
END\$\$
DELIMITER;
3.
DELIMITER \$\$
CREATE PROCEDURE DISPLAY3(IN DEPTNO decimal(4,0), OUT DNAME varchar(15), OUT SMALLEST_SALARY decimal(5,0),
HIGHEST_SALARY decimal(10,0))
BEGIN
SELECT employee_id, concat(first_name," ",last_name), department_name, min(salary), max(salary), sum(salary)
FROM employees join departments using(department_id)
WHERE department_id=DEPTNO;
END\$\$
DELIMITER;
4.
DELIMITER //
CREATE FUNCTION MANAGER()
RETURNS DECIMAL(10,0)
DETERMINISTIC
BEGIN
DECLARE EMP DECIMAL(10,0);



```
SELECT SUM(salary)
INTO EMP
FROM employees
WHERE employee_id=manager_id;
return EMP;
END//
DELIMITER;
5.
DELIMITER //
CREATE FUNCTION MANAGER2(empno decimal(4,0))
RETURNS varchar(15)
DETERMINISTIC
BEGIN
DECLARE managerName varchar(15);
SELECT CONCAT(first_name," ",last_name) as managerName
INTO managerName
FROM employees
WHERE employee_id=manager_id AND employee_id=empno;
RETURN managerName;
END //
DELIMITER;
6.
DELIMITER $$
CREATE FUNCTION MANAGER3(managerName varchar(10))
RETURNS DECIMAL(10,0)
DETERMINISTIC
BEGIN
DECLARE AVG_Salary DECIMAL(10,0);
```



SELECT AVG(SALARY) as AVG_SALARY INTO AVG_SALARY FROM employees WHERE first_name=managerName; RETURN AVG_SALARY; END\$\$ **DELIMITER**; **Lab 11** 1. **DELIMITER \$\$** CREATE PROCEDURE countEven (IN anyNumber int) **BEGIN** DECLARE count int; DECLARE sum int; set sum = 0;set count = 2;anyNumber: LOOP IF anyNumber < count THEN LEAVE any Number; ELSEIF mod(anyNumber,2) = 0 THEN SET anyNumber = anyNumber+count; END IF; SET count=count+1; END LOOP anyNumber; END\$\$ **DELIMITER**;



2. **DELIMITER \$\$** CREATE PROCEDURE checkCustomer (IN customerNumber INT) **BEGIN** DECLARE check_customer INT; DECLARE isPresent varchar(20); SELECT customerNumber INTO check_customer From customers WHERE check_customer = customerNumber; IF check_customer IS NOT NULL THEN SET isPresent="Customer Exists"; ELSE SET isPresent="Customer not Exists"; END IF; SELECT is Present; END\$\$ **DELIMITER:** 3. **DELIMITER \$\$** CREATE PROCEDURE CountEmployees (OUT count_employees INT, IN office_code INT) **BEGIN** CASE WHEN office_code>3 THEN SELECT count(*) INTO count_employees

FROM employees



```
WHERE office_code > '3';
WHEN office_code<3
     THEN SELECT count(*)
 INTO count_employees
 FROM employees
 WHERE office_code < '3';
Else
     SELECT count(*)
 INTO count_employees
 FROM employees
 WHERE office_code = '3';
END CASE;
END$$
DELIMITER;
4.
DELIMITER $$
CREATE PROCEDURE EvenOdd(IN anyNumber INT)
BEGIN
DECLARE check_EvenOdd varchar(20);
     IF mod(anyNumber,2)=0
          THEN SET check_EvenOdd = "Number is Even";
 ELSE
          SET check_EvenOdd = "Number is Odd";
END IF;
SELECT check_EvenOdd;
END$$
DELIMITER;
```



Lab 12

1. CREATE VIEW displayRecords AS SELECT employee_id, CONCAT(first_name," ",last_name) as Employee_Name, salary, department_id FROM employees WHERE department_id=10; 2. SELECT * FROM displayRecords; 3. UPDATE displayRecords SET department_id=20 WHERE employee_id=200; SELECT * FROM displayRecords; >> >> Record with employee_id 200 is missing... 4. **CREATE VIEW Simple AS SELECT * FROM EMPLOYEES** WITH CHECK OPTION; 5. **CREATE VIEW Display AS** SELECT CONCAT(first_name, " ",last_name) as Employee_Name, department_name, salary FROM employees join departments USING(department_id) WHERE department_id=20; 6. **CREATE TABLE EMP55 AS** SELECT * FROM employees WHERE department_id=10; CREATE VIEW MY VU AS SELECT * FROM EMP55 WHERE department_id=10; 7. CREATE TABLE Emp2 AS SELECT * FROM EMPLOYEES;



CREATE INDEX First_name on Emp2(First_name);

8.

CREATE INDEX department_name on departments(department_name);

9.

DROP INDEX first_name on Emp2;

10.

SHOW INDEXES FROM DEPARTMENTS;

DROP INDEX 'PRIMARY' ON departments;

DROP INDEX DEPT_MGR_FK ON departments;

DROP INDEX DEPT_LOCATION_IX ON departments;

DROP INDEX department_name ON departments;

~END OF LABS~