**Database Systems**

**Fall 2020**

**LAB – 10**

**The objective of this lab is to:**

* Revision from Basic to Normalization

**Course & Lab Instructor:** Sir Asif Sohail

Instructions:

* Work on this lab individually. Discussion is not allowed.
* Evaluation of tasks will be conducted in lab.
* Anyone caught being indulged in the act of plagiarism would be awarded an “F” grade in this lab.
* Evaluation will be considered final and you cannot debate for the marks. So, focus

on performing the tasks when the time is given to you.

* **Allowed time: 1 hour and 30 minutes**
* Best of Luck!

**Note:** You will be using following tables in your lab tasks.

* EMP (EMPNO, ENAME, JOB, SAL, HIREDATE, COMM, MGR, DEPTNO)
* DEPT (DEPTNO, DNAME, LOC)
* PUCIT (STD\_NAME)
* **Perform the following tasks**

**Task 01: [7 Marks]**

1. **Show the structure of dept table.**

Describe dept

1. **Write a query to extract unique jobs and their counts from emp table**

SELECT job, COUNT(\*) AS JobCount FROM emp GROUP BY job

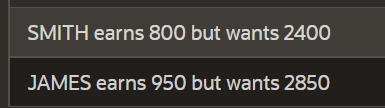
1. **Write a query to display the names (ename) and salary for all employees whose salary is not in the range $10,000 through $15,000 and are in department 10 or 30**

Select ENAME , SAL

From EMP

Where SAL not between 10000 AND 15000

And DEPTNO IN (10, 30)

1. **Write a query to list the employees earning less than 1000 in following way  
   <Employee name> earns <employee salary> but wants <Three times employee salary>  
   **

select ENAME||' earns '||SAL||' but wants $'||SAL\*3

where SAL<1000

from emp

1. **Display the ename, dname and job for all the employees from research dept.**  
   SELECT ENAME, dname,job from emp e join dept d on e.deptno=d.deptno and dname='RESEARCH'
2. **Create an index on ename of the emp table.**

create index ind

on emp(ename)

1. **USE NVL2 FUNCTION TO DISPLAY NET SAL OF EACH EMPLOYEE CONSISTING OF SAL + COMM.**

SELECT SAL,NVL2(comm,

SAL + Comm,SAL)

FROM EMP

**Task 02: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [20 Marks]**

1. **Display the employees who were not hired in leap years.**

select Ename  
from  
employees  
where mod(extract(year from hire\_date),4)=0

1. **Display the employees hiredate and dname of employees hired after employee Blake**

SELECT ename, hiredate, dname from emp e join dept d on (e.deptno=d.deptno)

where hiredate>=(select hiredate from emp where ename='BLAKE')

1. **List all the employees who earn less than average salary and arrange them is ascending order**

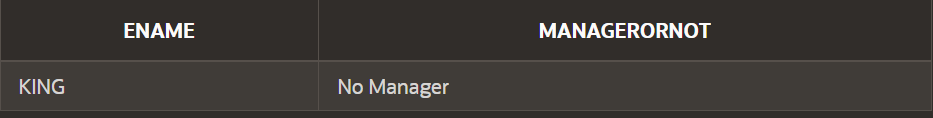
SELECT ename,sal

FROM emp

WHERE SAL < (SELECT AVG(SAL)

FROM emp)

ORDER BY SAL ASC

1. **Select ename of employees having no manager as following format  
   **

SELECT eName, ‘No Manager’ as MANAGERORNOT

FROM emp

WHERE MGR is NULL;

1. **Display the employees name, salary grade and dept name.**

select ename, grade, dname from emp e join dept d on e.deptno=d.deptno join salgrade s on sal between losal and hisal

1. **List the Emps whose sal is same as FORD or MARTIN and sort them in ascending order w.r.t sal (using Subquery).**

Select Ename,SAL

From Emp Where SAL IN(Select SAL

from Emp where eName LIKE 'MARTIN' OR ename like 'FORD')

1. **Find the job with the lowest salary.**

select job from emp where sal=(select min(sal) from emp)

1. **Display all the emps having salgrade Grade1 and Grade 4.**

Select \* from emp e join salgrade s on e.sal between losal and hisal where s.grade= 1 or s.grade=4

1. **Write a query to display the department name, location name, number of employees and the average salary for all the employees in that department. Round the salary to two decimal points.**

select dname, loc , count(empno), round(avg(sal),2) from dept d join emp e on e.deptno=d.deptno group by dname, loc

1. GENERATE A SALARY REPORT OF ALL THE EMPLOYEES WITH THEIR HOUSE RENT, MEDICAL ALLOWANCE, CONVEYANCE AND TAX AND TAKE HOME SALARY.

THE PERCENTAGES OF THE ATTRIBUTES ARE;

**HOME RENT: 15% OF THE ORIGINAL SALARY**

**MEDICAL ALLOWANCE: 7% OF THE ORIGINAL SALARY**

**CONVEYANCE: 12% OF THE ORIGINAL SALARY   
TAX: 1.5% OF THE ORIGINAL SALARY**And display remaining salary after all deductions

**Task 03: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [20 Marks]**

1. **Create a sequence named serial\_sequence with all options available for sequence creation**

Solution:

Create sequence serial\_sequence

increment by 1

start with 1

MAXVALUE 1000

MINVALUE 1

NOCYCLE

CACHE 2

1. **Create the Student table based on the following table instance chart.**

Name Type  
 ---------- -----------

S\_id NUMBER (Generated by serial\_Sequence) UNIQUE

ROLL NO VARCHAR2(25) PRIMARY KEY

NAME VARCHAR2(25)

SESSION ID VARCHAR2(25)

DEGREE TITLE VARCHAR2(25)

GPA NUMBER(3,2)

**Solution:**

Create table Student (

S\_id NUMBER(5) Unique,

ROLL\_NO VARCHAR2(25) PRIMARY KEY,

NAME VARCHAR2(25),

SESSION\_ID VARCHAR2(25),

DEGREE\_TITLE VARCHAR2(25),

GPA NUMBER(3,2)

)

1. **Create an INSERT statement to add the first row of data to the student table (Your own data). Solution:**

Insert into student values(serial\_sequence.nextval, 'bsef18m004', 'Afaq Shuaib', 'F18', 'BSCS', 3.77)

1. **Populate the STUDENT table with data. This time, list the columns explicitly in the INSERT clause. Enter at least 5 rows.**

**Solution:**

Insert into student values(serial\_sequence.nextval, 'bsef19m034', 'Ahmad Sarwar', 'F19', 'BSSE', 3.76)

Insert into student values(serial\_sequence.nextval, 'bsef19m013', 'Osama Sultan', 'F19', 'BSSE', 3.58)

Insert into student values(serial\_sequence.nextval, 'bsef19m035', 'Usama Javed', 'F19', 'BSSE', 3.56)

and soo on.....

1. **Modify the STUDENT table by adding a column LAST NAME and CGPA with their appropriate types. And rename the column ‘NAME’ to ‘FIRST\_NAME’.**

**Solution:**

ALTER TABLE student

ADD LAST\_NAME varchar2(25)

ALTER TABLE student

ADD CGPA number(3,2)

:) Above two queries can be done in a single one.

ALTER TABLE student

RENAME COLUMN NAME TO FIRST\_NAME

Update student

set FIRST\_NAME = substr(FIRST\_NAME, 0, instr(FIRST\_NAME,' ')),LAST\_NAME = substr(FIRST\_NAME, instr(FIRST\_NAME,' ')+1)

1. **Modify the STUDENT table. Concatenate the first letter of the first name and the first seven characters of the last name to produce the userid. For example**

|  |  |  |
| --- | --- | --- |
| Usama | Javed | UJaved |

**Solution:**

* ALTER TABLE student

ADD userid varchar2(25)

* Update student

set userid = concat(substr(first\_name, 0, 1), substr(last\_name, 0, 7))

1. **List positions of all the students on tha basis of GPA**

**Solution:**

Select \* from student

order by gpa desc

1. **Remove all the students with cgpa greater than 3.5**

**Solution:**

Delete from student

where cgpa > 3.5

**Task 04: (Viva) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [3 Marks]**

Questions related to

1. Cascade Deletion
2. How to make composite primary key
3. Rollback/commit
4. Finding Unnamed constraint names.
5. Normalization