

Final Project Proposal **Employee Payroll Management System**

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Name of Project: Employee Payroll Management System

Summary:

1. Employee Information

Employee data is very essential in order to maintain a proper record of the employees and their personal information for various purposes like contacting them for inviting for certain summit, feedback of the company from the employee data

2. Maintaining Salary

Very important to keep this data which will help not only the managers and the HR to keep a track of the employee salaries but also help the company or its board to analyze what amount they are spending on a particular employee of a particular company

3. Work Location

It is very much important for an organization small or big to have a record of all the work locations they operate from to see how they can develop in that particular region and also increase the hiring in that region so that the organization can increase their Market Outreach that area.

4. Projects

In order to be successful company should be involved in various projects, so they also need to maintain the record of the salaries each employee is being paid for a particular type of project he/she is working on

PL/SQL features used in the project:

1. Created Explicit Cursors which shows the hourly pay of the employees associated with their Accounts and Ref cursor showing the employees who are a part of a particular department

2. Create a CDB and a PDB with users to manage the data according to the area of interest

3. Implement pre-defined exception cursor_already_open to demonstrate the understanding of the exceptional handling concept which shows what error will populate when we try to open a cursor which is already open

4. Also, created Relational, Inline and Materialized Views satisfying various business requirements

5. Created Index on AccountDetails table

6. Built an E-R Diagram to know how the entities are related in the payroll management system for any company

List of Entities:

Employee

Employee table will include all the personal details of the employee and would be very much cover overall information of that particular employee

Salary

Salary Table will cover all the current and previous salaries an employee had or currently has. This table will help a manager/ an HR to analyze which employee has been given promotion on which date or when did his salary grade changed

Department

Department Table maintains the data of the all the possible departments an employee can belong to

Account Details

Account Details Table will maintain the data regarding the accounts which the employee has connected with the company for his/her salary to be credited

Attendance

This table includes all the data of the employees attendance which includes the number of hours an employee has worked in a week

Project

This table includes the data of all the projects a particular company is working on or the projects on which the company is going to work in the future

Education

The Education Table keeps the track of the education of the employee including his degrees achieved until now

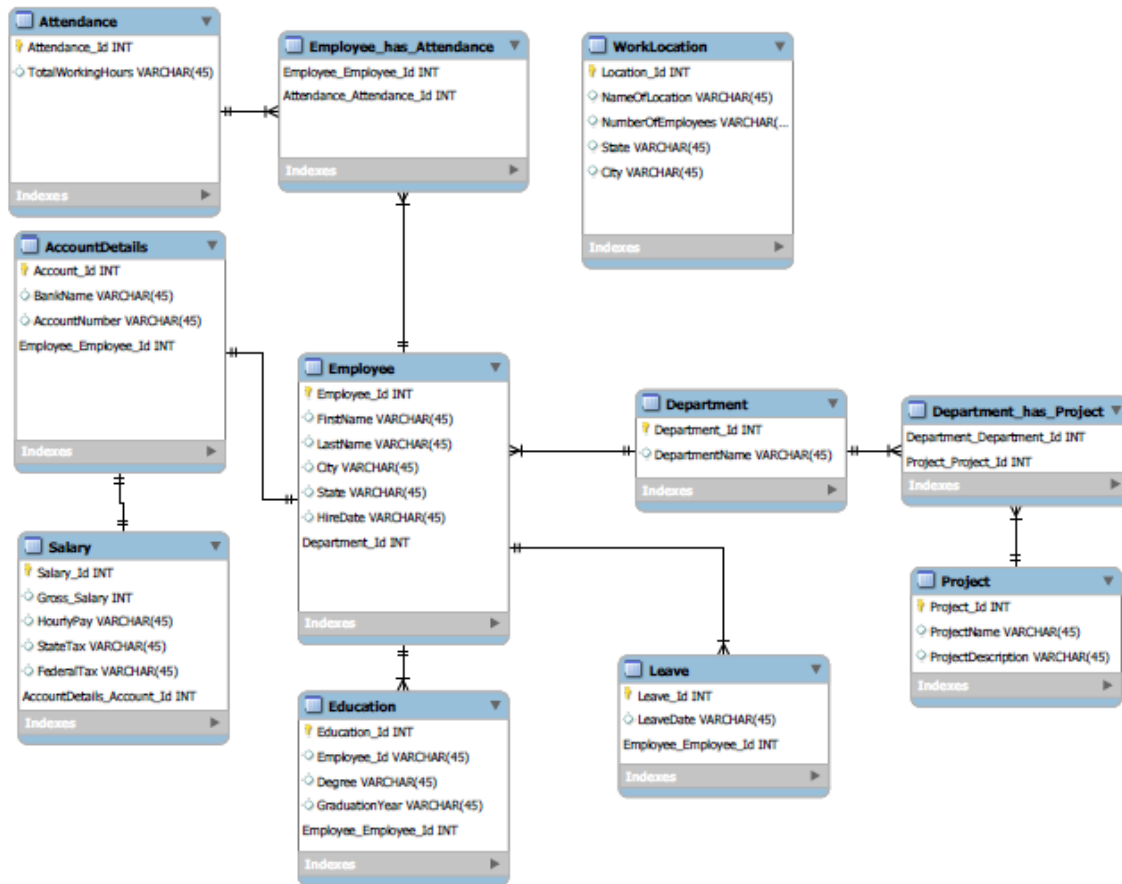
Work Location

The name of the table tells you most of the things. This table includes the location of the office, which city is it located, which state it is in and also tracks the number of employees in a particular location

Leave

Leave table keeps the record of the number of leaves an employee takes or has taken over the course of any month or an year

E-R Diagram



1.Created Common User on sysdba

```
SQL> create user C##ojas identified by ojas;

User created.
```

```
SQL> select username,common, oracle_maintained from all_users where username like 'C##OJAS';
```

USERNAME	COMMON	ORACLE_MAINTAINED
C##OJAS	YES	N

```
SQL> connect sys@orcl as sysdba
Enter password:
Connected.
SQL> grant all privileges to C##OJAS;

Grant succeeded.

SQL> disconnect
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
SQL> connect C##OJAS
Enter password:
Connected.
```

2. Create Pluggable Database

```
SQL> create pluggable database payroll_management_system
  2 ADMIN USER HR_ADMIN identified by hr;
ADMIN USER HR_ADMIN identified by hr
*
ERROR at line 2:
ORA-65016: FILE_NAME_CONVERT must be specified

SQL> alter system set pdb_file_name_convert = 'C:\Users\phansekar.o\Oracle\oradata\ORCL\pdbseed\','C:\Users\phansekar.o\Oracle\oradata\ORCL\payroll_management_system\' scope=both;

System altered.

SQL> create pluggable database payroll_management_system
  2 ADMIN USER HRADMIN identified by hradmin;

Pluggable database created.
```

```
SQL> show pdbs;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
5	PAYROLL_MANAGEMENT_SYSTEM	READ WRITE	NO

```
SQL> connect sys@orcl as sysdba
```

```
Enter password:
```

```
Connected.
```

```
SQL> show pdbs;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	ORCLPDB	MOUNTED	
4	OJPDB	READ WRITE	NO
5	PAYROLL_MANAGEMENT_SYSTEM	MOUNTED	

```
SQL> alter pluggable database payroll_management_system open read write;
```

```
Pluggable database altered.
```

```
SQL> select status from v$instance;
```

```
STATUS
```

```
-----
```

```
OPEN
```

```
SQL> show pdbs;
```

CON_ID	CON_NAME	OPEN MODE	RESTRICTED
2	PDB\$SEED	READ ONLY	NO
3	ORCLPDB	MOUNTED	
4	OJPDB	READ WRITE	NO
5	PAYROLL_MANAGEMENT_SYSTEM	READ WRITE	NO

```
SQL> disconnect
```

```
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production  
Version 19.3.0.0.0
```

```
SQL> connect C##OJAS
```

```
Enter password:
```

```
Connected.
```

```
SQL> connect sys@payroll_management_system as sysdba
```

```
Enter password:
```

```
Connected.
```

3. Inline View

```
SQL> select Department_Name, count(*),
  2  to_char((count(*)/No_of_Employees.cnt)*100, '90.99') Percentages
  3  from Department,Employee, ( select count(*) cnt from Employee ) No_of_Employees
  4  where Department.Department_Id = Employee.Department_Id
  5  group by Department_Name, No_of_Employees.cnt
  6  /
```

DEPARTMENT_NAME	COUNT(*)	PERCEN
Data Analysis	1	10.00
Data Science	1	10.00
Data Engineering	1	10.00
Human Resources	1	10.00
Software Development	1	10.00
Business Intelligence	1	10.00
Manufacturing	2	20.00
Quality Control	2	20.00

8 rows selected.

4. Materialized Views

-- Number of Employees with different degrees

```
SQL> select * from Education_View;
```

DEGREE	COUNT(DEGREE)
Bachelor	3
MS	4

5. Explicit Cursor

```
SQL> declare
  2   cursor salaries(p_hourly in number)
  3   is select *
  4   from Salary
  5   where Hourly_Pay=p_hourly;
  6
  7   l_sal Salary%rowtype;
  8   begin
  9     dbms_output.put_line(' Extracting hourly pay');
 10     open salaries(30);
 11     loop
 12       fetch salaries into l_sal;
 13     exit when salaries%notfound;
 14     dbms_output.put('For Account ' || l_sal.Account_Id || ' Hourly Pay is ');
 15       dbms_output.put_line(l_sal.hourly_pay);
 16   end loop;
 17   close salaries;
 18   end;
 19   /
Extracting hourly pay
For Account 40 Hourly Pay is 30
For Account 44 Hourly Pay is 30
For Account 48 Hourly Pay is 30

PL/SQL procedure successfully completed.
```

6. Index

```
SQL> create index account_ix
  2   on AccountDetails(Bank_Name);

Index created.
```

7. Relational Views

```
SQL> create or replace view salary_range_calculator
 2  as
 3  select e.First_Name, s.Hourly_Pay
 4  from Employee e
 5  inner join AccountDetails a
 6  on e.Employee_Id = a.Employee_Id
 7  inner join Salary s
 8  on a.Account_Id = s.Account_Id
 9  where s.Hourly_Pay = 30;
```

View created.

```
SQL> select * from salary_range_calculator;
```

FIRST_NAME	HOURLY_PAY
Ojas	30
Anugraha	30
Kalpita	30

8. Transaction

```
SQL> INSERT INTO Employee VALUES (111,'Priyanka','Jonas',to_date('14-NOV-16', 'dd-MON-yyyy'),'New York City','New York',1);
1 row created.

SQL>
SQL> commit;
Commit complete.

SQL>
SQL> INSERT INTO Employee VALUES (112,'John','Vincent',to_date('21-JUN-18', 'dd-MON-yyyy'),'Boston','Massachusetts',2);
1 row created.

SQL>
SQL> SAVEPOINT A1;
Savepoint created.

SQL>
SQL> INSERT INTO Employee VALUES (113,'Pratik','Panhale',to_date('13-SEP-19', 'dd-MON-yyyy'),'Chicago','Illinois',3);
1 row created.

SQL>
SQL> SAVEPOINT A2;
Savepoint created.

SQL>
SQL> ROLLBACK A1;
ROLLBACK A1
*
ERROR at line 1:
ORA-02181: invalid option to ROLLBACK WORK

SQL> ROLLBACK TO A1;
Rollback complete.
```


9. External Table

```
SQL> create directory ext_Salaries
  2  as 'C:\Users\phansekar.o\Desktop\Salary.csv'
  3  /

Directory created.

SQL> grant all on directory ext_Salaries to HRADMIN
  2  /

Grant succeeded.

SQL> create table Salary_External (
  2  Salary_Id NUMBER,
  3  Gross_Salary NUMBER,
  4  Hourly_Pay NUMBER,
  5  State_Tax NUMBER,
  6  Federal_Tax NUMBER,
  7  Account_Id NUMBER
  8  )
  9  organization external (
 10  type oracle_loader
 11  default directory ext_Salaries
 12  access parameters (
 13  fields terminated by ',' )
 14  location ('Salary.csv')
 15  )
 16  reject limit unlimited
 17  /

Table created.
```

```
SQL> desc Salary_External;

Name                               Null?    Type
-----
SALARY_ID                           NUMBER
GROSS_SALARY                        NUMBER
HOURLY_PAY                          NUMBER
STATE_TAX                          NUMBER
FEDERAL_TAX                        NUMBER
ACCOUNT_ID                          NUMBER
```

10. Ref cursor

```
SQL> declare
  2  type emp_dept_rec is record(
  3  Employee_Id number,
  4  First_Name varchar2(66),
  5  Department_Name varchar2(37)
  6  );
  7
  8  type emp_dept_refcur_type is ref cursor
  9  return emp_dept_rec;
 10
 11  employee_refcur emp_dept_refcur_type;
 12
 13  emp_dept emp_dept_rec;
 14  begin
 15  open employee_refcur for
 16  select e.Employee_Id,
 17         e.First_Name || ' ' || e.Last_Name "Employee Name",
 18         d.Department_Name
 19  from Employee e, Department d
 20  where e.Department_Id = d.Department_Id
 21  and rownum < 5
 22  order by e.Employee_Id;
 23
 24  fetch employee_refcur into emp_dept;
 25  while employee_refcur%FOUND loop
 26  dbms_output.put(emp_dept.First_Name || ''s department is ');
 27  dbms_output.put_line(emp_dept.Department_Name);
 28  fetch employee_refcur into emp_dept;
 29  end loop;
 30  end;
 31  /
Ojas Phansekar's department is Human Resources
Vrushali Patil's department is Software Development
Pratik Parija's department is Data Analysis
Chetan Mistry's department is Data Science

PL/SQL procedure successfully completed.
```

11. Pre-defined Exception

```
SQL> declare
  2  l_attendance Attendance%rowtype;
  3  begin
  4  l_attendance.Attendance_Id := 90;
  5  l_attendance.Hours_Worked := 'AS';
  6  insert into Attendance (Attendance_Id,Hours_Worked)
  7  values ( l_attendance.Attendance_Id, l_attendance.Hours_Worked );
  8  exception
  9  when VALUE_ERROR then
 10  dbms_output.put_line('We encountered the VALUE_ERROR exception');
 11  end;
 12  /
We encountered the VALUE_ERROR exception

PL/SQL procedure successfully completed.
```

12. Procedure

```
SQL> CREATE OR REPLACE PROCEDURE Unimportant_Locations(l_NOFEmployees IN Number)
2  IS
3    l_wl NUMBER;
4    l_emp NUMBER;
5
6  BEGIN
7    SELECT COUNT(*) INTO l_wl
8    FROM Work_Location
9    WHERE Number_Of_Employees LIKE l_NOFEmployees;
10
11
12    select count(*)
13    into l_emp
14    from Employee e
15    inner join Work_Location w
16    on e.Employee_Id = w.Employee_Id
17    where w.Number_Of_Employees LIKE l_NOFEmployees;
18
19    IF l_wl < 5 THEN
20      DELETE FROM Work_Location
21      WHERE Number_Of_Employees = l_NOFEmployees;
22    END IF;
23
24    EXCEPTION WHEN no_data_found THEN
25      DBMS_OUTPUT.PUT_LINE('No Such Data Available');
26  END;
27  /
```

Procedure created.

```
SQL> execute Unimportant_Locations(5);
```

PL/SQL procedure successfully completed.

```
SQL> select * from Work_Location;
```

LOCATION_ID	LOCATION	NUMBER_OF_EMPLOYEES	CITY	STATE	EMPLOYEE_ID
71	North	4	New York City	New York	101
72	North	4	Boston	Massachusetts	102
73	North	4	Chicago	Illinois	103
74	North	89	Miami	Florida	104
75	South	90	Atlanta	Georgia	105
76	South	100	San Mateo	California	106
77	South	4	San Francisco	California	107

13. Predefined Exception and Explicit Cursor

```
SQL> declare
  2   cursor salaries(p_hourly in number)
  3   is select *
  4   from Salary
  5   where Hourly_Pay=p_hourly;
  6
  7   l_sal Salary%rowtype;
  8   begin
  9     dbms_output.put_line('Getting hourly pay');
 10     open salaries(30);
 11     loop
 12       fetch salaries into l_sal;
 13     exit when salaries%notfound;
 14     dbms_output.put('For Account ' || l_sal.Account_Id || ' Hourly Pay is ');
 15       dbms_output.put_line(l_sal.hourly_pay);
 16   end loop;
 17   open salaries(30);
 18   exception
 19   when CURSOR_ALREADY_OPEN then
 20     dbms_output.put_line('No Need to open cursor again');
 21   close salaries;
 22   end;
 23   /
Getting hourly pay
For Account 40 Hourly Pay is 30
For Account 44 Hourly Pay is 30
For Account 48 Hourly Pay is 30
No Need to open cursor again

PL/SQL procedure successfully completed.
```

Appendix:

Create Table Statements

Employee

```
CREATE TABLE Employee(  
    Employee_Id NUMBER(6),  
    First_Name VARCHAR2(25),  
    Last_Name VARCHAR2(25),  
    Hire_Date DATE,  
    City VARCHAR2(25),  
    State VARCHAR2(25),  
    CONSTRAINT EMPLOYEE_PK PRIMARY KEY (Employee_Id));
```

Department

```
CREATE TABLE Department(  
    Department_Id NUMBER,  
    Department_Name VARCHAR2(30),  
    CONSTRAINT DEPARTMENT_PK PRIMARY KEY (Department_Id)  
);
```

Salary

```
CREATE TABLE Salary(  
    Salary_Id NUMBER,
```

```
Gross_Salary NUMBER,  
Hourly_Pay NUMBER,  
State_Tax NUMBER,  
Federal_Tax NUMBER,  
Account_Id NUMBER,  
CONSTRAINT SALARY_PK PRIMARY KEY (Salary_Id),  
FOREIGN KEY (Account_Id)  
    REFERENCES ACCOUNTDETAILS(Account_Id)  
);
```

DepartmentProject Bridge

```
CREATE TABLE DepartmentProject(  
    Department_Id NUMBER,  
    Project_Id NUMBER,  
    CONSTRAINT DEPTPROJECT_PK PRIMARY KEY (Department_Id,Project_Id),  
    FOREIGN KEY (Department_Id)  
        REFERENCES Department(Department_Id),  
    FOREIGN KEY (Project_Id)  
        REFERENCES Project(Project_Id)  
);
```

Project

```
CREATE TABLE Project(  
    Project_Id NUMBER,  
    Project_Name VARCHAR2(50),  
    Project_Description VARCHAR2(50),
```

CONSTRAINT Project_PK PRIMARY KEY (Project_Id)

);

AccountDetails

CREATE TABLE AccountDetails(
Account_Id NUMBER,
Bank_Name VARCHAR2(50),
Account_Number VARCHAR2(50),
Employee_Id NUMBER,
CONSTRAINT Account_PK PRIMARY KEY (Account_Id),
FOREIGN KEY (Employee_Id)
REFERENCES Employee(Employee_Id)
);

Education

CREATE TABLE Education(
Education_Id NUMBER,
Employee_Id NUMBER,
Degree VARCHAR(30),
Graduation_Year NUMBER(4),
CONSTRAINT Location_PK PRIMARY KEY (Education_Id),
FOREIGN KEY (Employee_Id)
REFERENCES Employee(Employee_Id)
);

Leave

```
CREATE TABLE Leave(  
  Leave_Id NUMBER,  
  Employee_Id NUMBER,  
  Leave_date DATE,  
  CONSTRAINT Leave_PK PRIMARY KEY (Leave_Id),  
  FOREIGN KEY (Employee_Id)  
    REFERENCES Employee(Employee_Id)  
);
```

EmployeeAttendance Bridge

```
CREATE TABLE Employee_Attendance(  
  Employee_Id NUMBER,  
  Attendance_Id NUMBER,  
  CONSTRAINT DEPARTMENTPROJECT_PK PRIMARY KEY (Employee_Id,Attendance_Id),  
  FOREIGN KEY (Employee_Id)  
    REFERENCES Employee(Employee_Id),  
  FOREIGN KEY (Attendance_Id)  
    REFERENCES Attendance(Attendance_Id)  
);
```

Attendance

```
CREATE TABLE Attendance(  
Attendance_Id NUMBER,  
Hours_Worked NUMBER,  
CONSTRAINT Attendance_PK PRIMARY KEY (Attendance_Id)  
);
```

WorkLocation

```
CREATE TABLE Work_Location(  
Location_Id NUMBER,  
Location VARCHAR2(25),  
Number_Of_Employees NUMBER,  
City VARCHAR2(25),  
State VARCHAR2(25),  
CONSTRAINT Loc_PK PRIMARY KEY (Location_Id)  
);
```

Insert Statements

```
INSERT INTO Employee VALUES (101,'Ojas','Phansekar',to_date('14-APR-16', 'dd-MON-yyyy'),'New York  
City','New York',1);
```

```
INSERT INTO Employee VALUES (102,'Vrushali','Patil',to_date('21-JUN-18', 'dd-MON-  
yyyy'),'Boston','Massachusetts',2);
```

```
INSERT INTO Employee VALUES (103,'Pratik','Parija',to_date('13-SEP-19', 'dd-MON-  
yyyy'),'Chicago','Illinois',3);
```

```
INSERT INTO Employee VALUES (104,'Chetan','Mistry',to_date('12-APR-11', 'dd-MON-  
yyyy'),'Miami','Florida',4);
```

```
INSERT INTO Employee VALUES (105,'Anugraha','Varkey',to_date('16-AUG-17', 'dd-MON-  
yyyy'),'Atlanta','Georgia',5);
```

INSERT INTO Employee VALUES (106,'Rasagnya','Reddy',to_date('25-JUL-18', 'dd-MON-yyyy'),'San Mateo','California',6);

INSERT INTO Employee VALUES (107,'Aishwarya','Boralkar',to_date('18-DEC-10', 'dd-MON-yyyy'),'San Francisco','California',7);

INSERT INTO Employee VALUES (108,'Shantanu','Savant',to_date('27-NOV-15', 'dd-MON-yyyy'),'Seattle','Washington',8);

INSERT INTO Employee VALUES (109,'Kalpita','Malvankar',to_date('24-APR-16', 'dd-MON-yyyy'),'Boston','Massachusetts',8);

INSERT INTO Employee VALUES (110,'Saylee','Bhagat',to_date('21-MAY-14', 'dd-MON-yyyy'),'San Francisco','California',7);

INSERT INTO Department VALUES (1,'Human Resources');

INSERT INTO Department VALUES (2,'Software Development');

INSERT INTO Department VALUES (3,'Data Analysis');

INSERT INTO Department VALUES (4,'Data Science');

INSERT INTO Department VALUES (5,'Business Intelligence');

INSERT INTO Department VALUES (6,'Data Engineering');

INSERT INTO Department VALUES (7,'Manufacturing');

INSERT INTO Department VALUES (8,'Quality Control');

INSERT INTO Project VALUES (21,'Dev','Whatever');

INSERT INTO Project VALUES (22,'Prod','do something');

INSERT INTO Project VALUES (23,'Test','focus');

INSERT INTO Project VALUES (24,'Nothing','do nothing');

INSERT INTO Project VALUES (25,'Research','focus on everything');

INSERT INTO Project VALUES (26,'Next Steps','find some way out');

INSERT INTO AccountDetails VALUES (40,'Santander','S12344',101);

INSERT INTO AccountDetails VALUES (41,'Santander','S12345',102);

```
INSERT INTO AccountDetails VALUES (42,'Santander','S12346',103);
INSERT INTO AccountDetails VALUES (43,'Santander','S12347',104);
INSERT INTO AccountDetails VALUES (44,'Chase','C12344',105);
INSERT INTO AccountDetails VALUES (45,'Chase','C12345',106);
INSERT INTO AccountDetails VALUES (46,'Chase','C12347',107);
INSERT INTO AccountDetails VALUES (47,'Chase','C12334',108);
INSERT INTO AccountDetails VALUES (48,'BOFA','C12378',109);
INSERT INTO AccountDetails VALUES (49,'BOFA','C12390',110);
```

```
INSERT INTO Education VALUES (10,101,'MS',2017);
INSERT INTO Education VALUES (11,102,'MS',2019);
INSERT INTO Education VALUES (12,104,'MS',2011);
INSERT INTO Education VALUES (13,108,'MS',2015);
INSERT INTO Education VALUES (14,109,'Bachelor',2013);
INSERT INTO Education VALUES (15,107,'Bachelor',2008);
INSERT INTO Education VALUES (16,106,'Bachelor',2007);
```

```
INSERT INTO Leave VALUES (51,104,to_date('1-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (52,108,to_date('2-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (53,109,to_date('3-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (54,107,to_date('4-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (55,106,to_date('5-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (56,104,to_date('6-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (57,108,to_date('7-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (58,109,to_date('7-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (59,107,to_date('8-DEC-19', 'dd-MON-yyyy'));
INSERT INTO Leave VALUES (60,106,to_date('9-DEC-19', 'dd-MON-yyyy'));
```

INSERT INTO Attendance VALUES (90,10);
INSERT INTO Attendance VALUES (91,20);
INSERT INTO Attendance VALUES (92,30);
INSERT INTO Attendance VALUES (93,40);
INSERT INTO Attendance VALUES (94,45);
INSERT INTO Attendance VALUES (95,56);
INSERT INTO Attendance VALUES (96,58);

INSERT INTO Work_Location VALUES (71,'North',4,'New York City','New York',101);
INSERT INTO Work_Location VALUES (72,'North',4,'Boston','Massachusetts',102);
INSERT INTO Work_Location VALUES (73,'North',4,'Chicago','Illinois',103);
INSERT INTO Work_Location VALUES (74,'North',89,'Miami','Florida',104);
INSERT INTO Work_Location VALUES (75,'South',90,'Atlanta','Georgia',105);
INSERT INTO Work_Location VALUES (76,'South',100,'San Mateo','California',106);
INSERT INTO Work_Location VALUES (77,'South',4,'San Francisco','California',107);
INSERT INTO Work_Location VALUES (78,'South',2,'Seattle','Washington',108);
INSERT INTO Work_Location VALUES (79,'South',25,'Alpharetta','Georgia',109);
INSERT INTO Work_Location VALUES (80,'South',20,'Keene','New Hampshire',110);
INSERT INTO Work_Location VALUES (81,'South',22,'Hampton','New Hampshire',109);

INSERT INTO Employee_Attendance VALUES (101,90);
INSERT INTO Employee_Attendance VALUES (102,91);
INSERT INTO Employee_Attendance VALUES (103,92);
INSERT INTO Employee_Attendance VALUES (104,93);
INSERT INTO Employee_Attendance VALUES (105,94);
INSERT INTO Employee_Attendance VALUES (106,95);
INSERT INTO Employee_Attendance VALUES (107,96);
INSERT INTO Employee_Attendance VALUES (108,91);

INSERT INTO Employee_Attendance VALUES (109,92);

INSERT INTO Employee_Attendance VALUES (110,93);

INSERT INTO DepartmentProject VALUES (1,21);

INSERT INTO DepartmentProject VALUES (2,22);

INSERT INTO DepartmentProject VALUES (3,23);

INSERT INTO DepartmentProject VALUES (4,24);

INSERT INTO DepartmentProject VALUES (5,25);

INSERT INTO DepartmentProject VALUES (6,26);

INSERT INTO DepartmentProject VALUES (7,21);

INSERT INTO DepartmentProject VALUES (8,24);

INSERT INTO Salary VALUES (1,57600,30,200,1000,40);

INSERT INTO Salary VALUES (2,76800,40,300,1300,41);

INSERT INTO Salary VALUES (3,96000,50,400,1500,42);

INSERT INTO Salary VALUES (4,115200,60,500,1700,43);

INSERT INTO Salary VALUES (5,57600,30,200,1000,44);

INSERT INTO Salary VALUES (6,76800,40,300,1300,45);

INSERT INTO Salary VALUES (7,96000,50,400,1500,46);

INSERT INTO Salary VALUES (8,115200,60,500,1700,47);

INSERT INTO Salary VALUES (9,57600,30,200,1000,48);

INSERT INTO Salary VALUES (10,76800,40,300,1300,49);

Inline View

select Department_Name, count(*),

to_char((count(*)/No_of_Employees.cnt)*100, '90.99') Percentages

from Department,Employee, (select count(*) cnt from Employee) No_of_Employees

where Department.Department_Id = Employee.Department_Id

group by Department_Name, No_of_Employees.cnt

/

Materialized View

Number of Employees with different degrees

create materialized view Education_View

build immediate

refresh on commit

as

select Degree, count(Degree)

from Education

group by Degree;

Procedure

Locations with less number of employees

CREATE OR REPLACE PROCEDURE Unimportant_Locations(I_NOFEmployees IN Number)

IS

I_wl NUMBER;

I_emp NUMBER;

BEGIN

SELECT COUNT(*) INTO I_wl

FROM Work_Location

WHERE Number_Of_Employees LIKE I_NOFEmployees;

select count(*)

into I_emp

from Employee e

```
inner join Work_Location w
on e.Employee_Id = w.Employee_Id
where w.Number_Of_Employees LIKE l_NOFEmployees;
```

```
IF l_wl < 5 THEN
DELETE FROM Work_Location
WHERE Number_Of_Employees = l_NOFEmployees;
END IF;
```

```
EXCEPTION WHEN no_data_found THEN
DBMS_OUTPUT.PUT_LINE('No Such Data Available');
END;
```

Explicit Cursor

```
declare
    cursor salaries(p_hourly in number)
is select *
from Salary
where Hourly_Pay=p_hourly;

l_sal Salary%rowtype;
begin
    dbms_output.put_line(' Extracting hourly pay');
    open salaries(30);
    loop
        fetch salaries into l_sal;
        exit when salaries%notfound;
        dbms_output.put('For Account ' || l_sal.Account_Id || ' Hourly Pay is ');
    dbms_output.put_line(l_sal.hourly_pay);
```



```

        end loop;

        close salaries;

    end;

/

```

Pre-Defined Exception

```

declare

    l_attendance Attendance%rowtype;

    New_Exception exception;

begin

    l_attendance.Attendance_Id := 90;

    l_attendance.Hours_Worked := 'AS';

    insert into Attendance (Attendance_Id,Hours_Worked)

    values ( l_attendance.Attendance_Id, l_attendance.Hours_Worked );

exception

    when VALUE_ERROR then

        dbms_output.put_line('We encountered the VALUE_ERROR exception');

end;

/

```

Explicit Cursor and Pre-Defined Cursor Together

```

declare

    cursor salaries(p_hourly in number)

    is select *

    from Salary

    where Hourly_Pay=p_hourly;

    l_sal Salary%rowtype;

begin

```

```

        dbms_output.put_line('Getting hourly pay');

        open salaries(30);

        loop

            fetch salaries into l_sal;

            exit when salaries%notfound;

            dbms_output.put('For Account ' || l_sal.Account_Id || ' Hourly Pay is ');

        dbms_output.put_line(l_sal.hourly_pay);

        end loop;

        open salaries(30);

        exception

        when CURSOR_ALREADY_OPEN then

            dbms_output.put_line('No Need to open cursor again');

            close salaries;

    end;

/

```

External Table

```

create table Salary_External (

    Salary_Id NUMBER,

    Gross_Salary NUMBER,

    Hourly_Pay NUMBER,

    State_Tax NUMBER,

    Federal_Tax NUMBER,

    Account_Id NUMBER

)

organization external (

    type oracle_loader

    default directory ext_Salaries

    access parameters (

```

```

        fields terminated by ',')
    location ('Salary.csv')
)
reject limit unlimited
/

```

Ref Cursor

```

declare
type emp_dept_rec is record(
    Employee_Id number,
    First_Name varchar2(66),
    Department_Name varchar2(37)
);

type emp_dept_refcur_type is ref cursor
    return emp_dept_rec;

employee_refcur emp_dept_refcur_type;

emp_dept emp_dept_rec;

begin
    open employee_refcur for
        select e.Employee_Id,
               e.First_Name || ' ' || e.Last_Name "Employee Name",
               d.Department_Name
        from Employee e, Department d
        where e.Department_Id = d.Department_Id
        and rownum < 5
        order by e.Employee_Id;

```

```
fetch employee_refcur into emp_dept;

while employee_refcur%FOUND loop

    dbms_output.put(emp_dept.First_Name || "'s department is ');

    dbms_output.put_line(emp_dept.Department_Name);

    fetch employee_refcur into emp_dept;

end loop;

end;

/
```

Transaction

```
INSERT INTO Employee VALUES (111,'Priyanka','Jonas',to_date('14-NOV-16', 'dd-MON-yyyy'),'New York City','New York',1);
```

```
commit;
```

```
INSERT INTO Employee VALUES (112,'John','Vincent',to_date('21-JUN-18', 'dd-MON-yyyy'),'Boston','Massachusetts',2);
```

```
SAVEPOINT A1;
```

```
INSERT INTO Employee VALUES (113,'Pratik','Panhale',to_date('13-SEP-19', 'dd-MON-yyyy'),'Chicago','Illinois',3);
```

```
SAVEPOINT A2;
```

```
ROLLBACK A1;
```

Relational View

create or replace view salary_range_calculator

as

select e.First_Name, s.Hourly_Pay

from Employee e

inner join AccountDetails a

on e.Employee_Id = a.Employee_Id

inner join Salary s

on a.Account_Id = s.Account_Id

where s.Hourly_Pay = 30;