Employee Attendance System

Term Projects – Instructions

DATABASE DESIGN TERM PROJECTS

Student ID	Student Name
442050494	Fahad Khalid Alhumaid
441051712	Mustafa Mahmoud Numan
442050608	Raed Manie Alghamdi

Introduction

The **ER diagram for employee attendance system** shows the relationships of the system's entities that build its **database design**. It is done by identifying the employee process entities, their properties, and the interactions between them.

The **employee attendance system** database design is sketched out using ER (entity-relationship) diagram. This sketch becomes the actual basis of the system's data storage that will serve as data destination and source.

Part 1: Requirements Analysis

Employee Attendance Management System Features

Employee Attendance Management - It is the main feature of the system wherein the designed ER diagram contains the basic details in attendance checking of the employees. The design will show the specific database that is needed in processing the checking of attendance and Management.

Employee Management - This feature plays a big role in the system because this gathers important information about the employee. This information was stored in the employee database and the data.

Manage Attendance Information - Attendance information management was important for the system because it serves as the basis for the whole attendance report. This will also help in calculating the number of employee absences for the whole working days .

Target

The objective of this project is to secure a good and consistent system for the Employees.

Requirements:

Each **employee** has a special number that is unique to identify himself. He also has a name - mentioning the details of the first and last name, gender, age , every employee should have also email, also the department in which he works and the powers if he has and also some laws that he must abide by

The employee is of three types, either an Administrative, Receptionist or Technician

We go to the heart of the matter, which is the state of attendance:

Then we find that we have the employee's number and the **status** of his presence, whether he is present or absent, and the date of the day

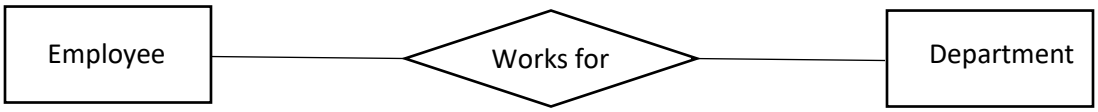
We also have another case that is not present and not absence, which is in the case that the employee is on **Vacation** and here we will have the number of the leave that the employee took and the number of the employee and the most important thing is when his leave began and when it will end

There is also a box describing the status of the employee who took the leave to know the reason for the leave

Part 2: Conceptual Design

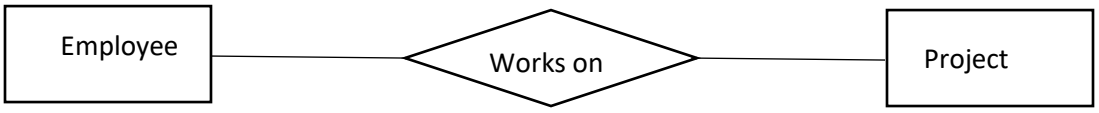
Entity: Employee, Department

Relationship: Employee works for department..



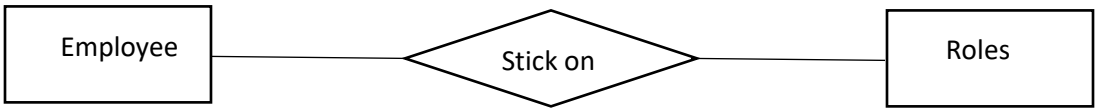
Entity: Employee, Project

Relationship: Employee works on project.



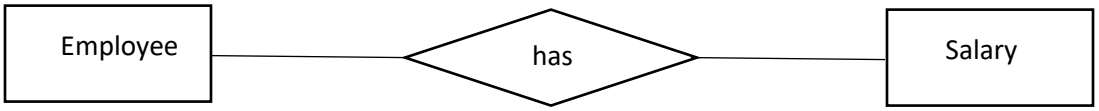
Entity: Employee, Roles

Relationship: Employee stick on role.



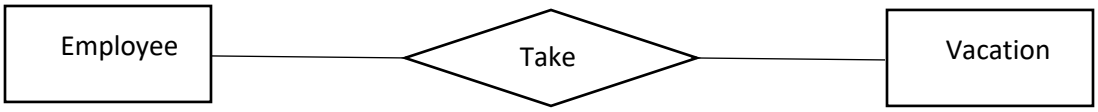
Entity: Employee, Salary

Relationship: Employee has salary.



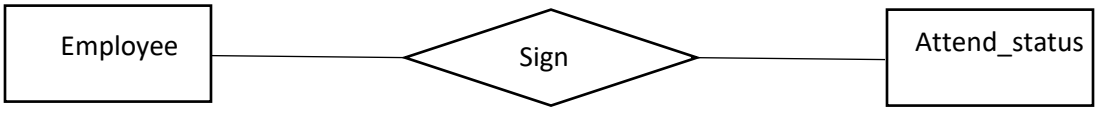
Entity: Employee, Vacation

Relationship: Employee take vacation.



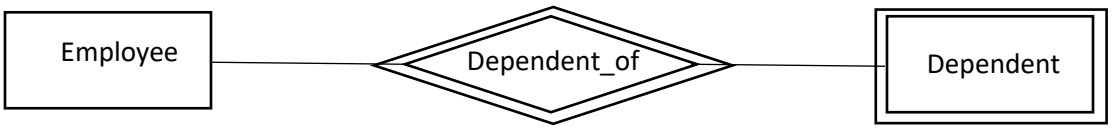
Entity: Employee, Attend_status

Relationship: Employee **sign** attendance_status.



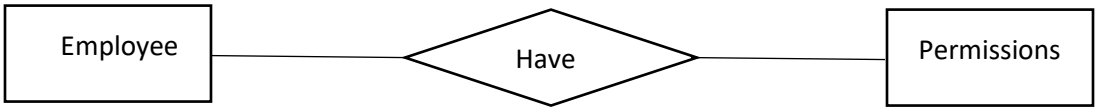
Entity: Employee, Dependent

Relationship: Employee dependent of Dependent.



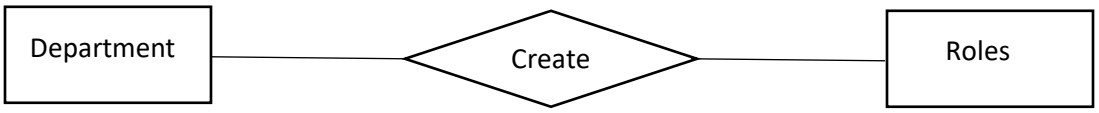
Entity: Employee, Permissions

Relationship: Employee have permission.



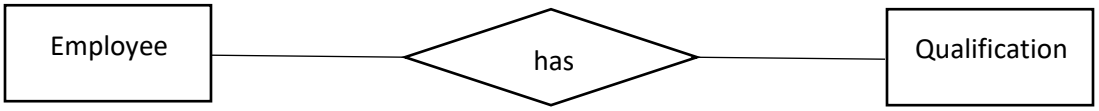
Entity: Department, Roles

Relationship: Department create roles.



Entity: Employee, Qualification

Relationship: Employee has qualification.

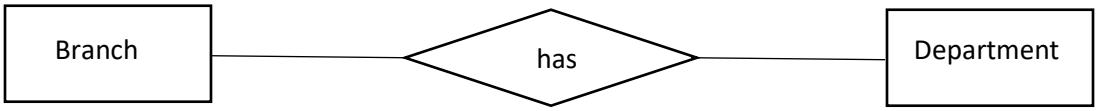


Entity: Department, Project

Relationship: Department control project.

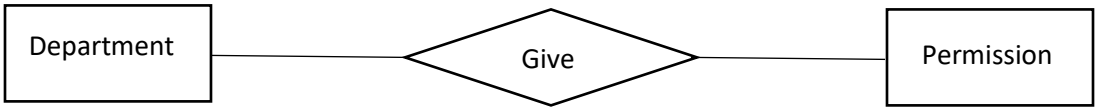
Entity: Department, Branch

Relationship: branch has Department.



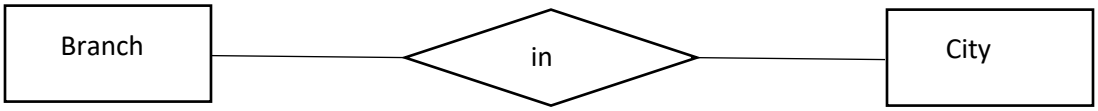
Entity: Department, Permission

Relationship: Department give permission.

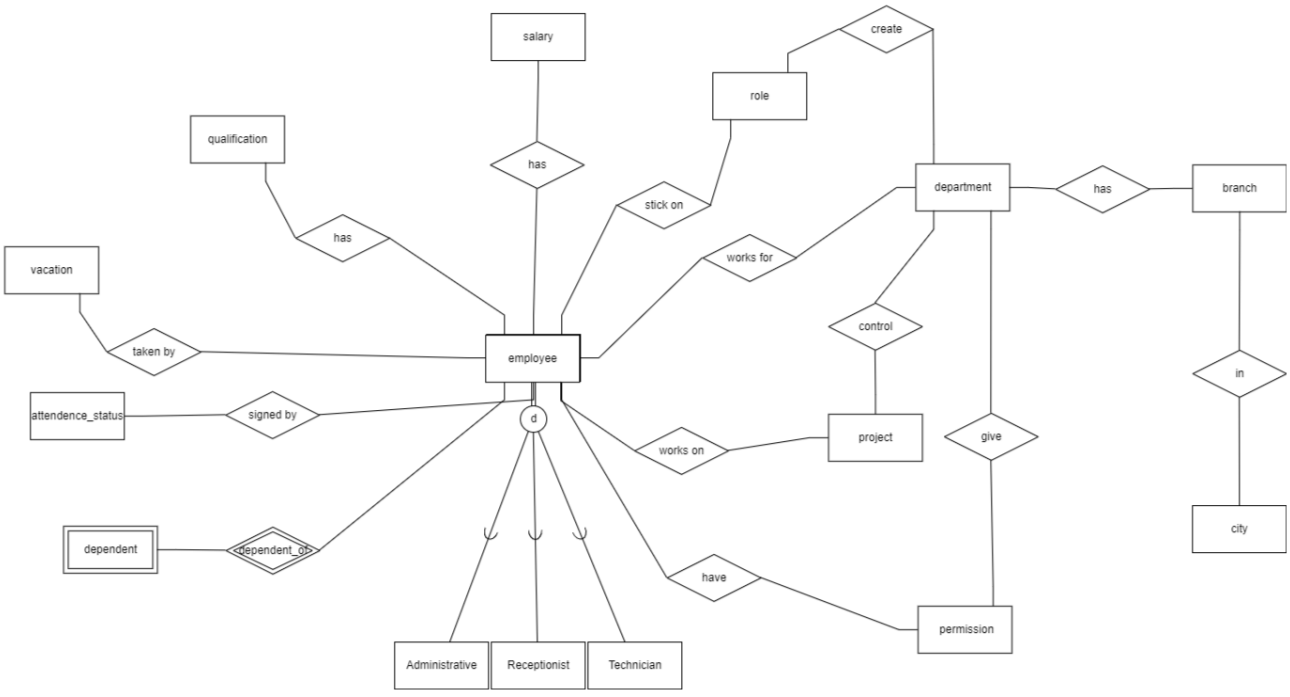


Entity: Branch, City

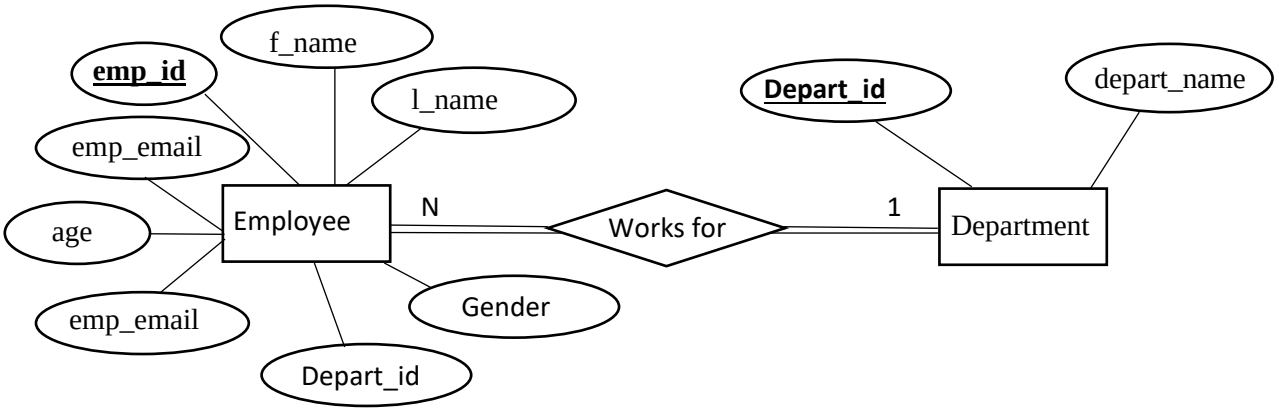
Relationship: Branch in city.



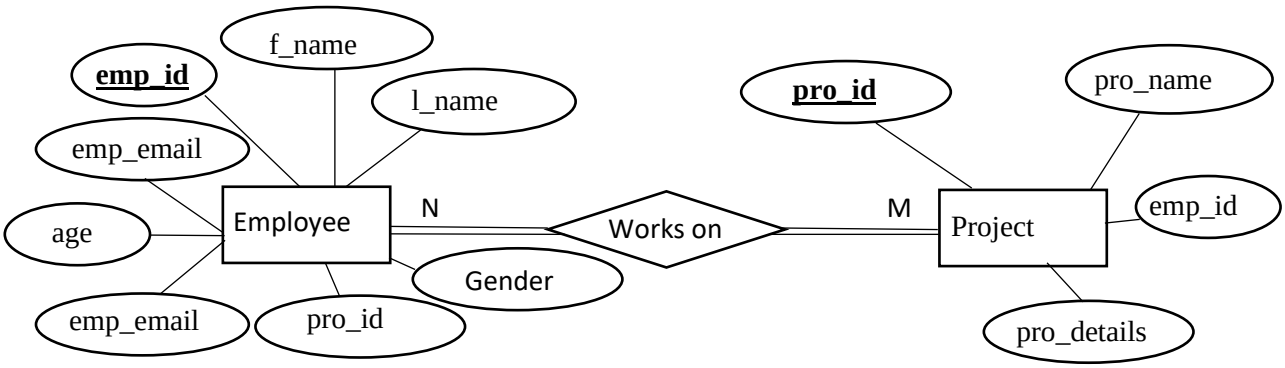
The following ER diagram was made in (ERDPLUS):



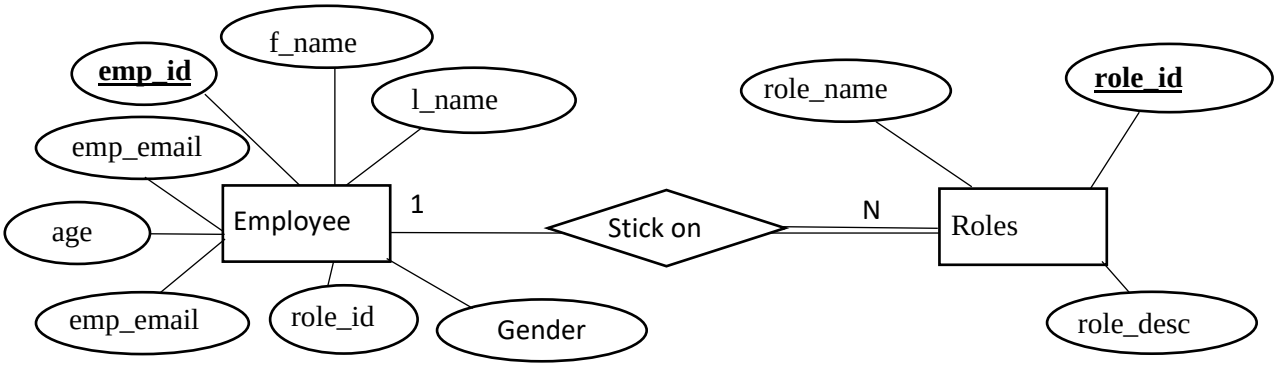
Part 3: Detailed Design



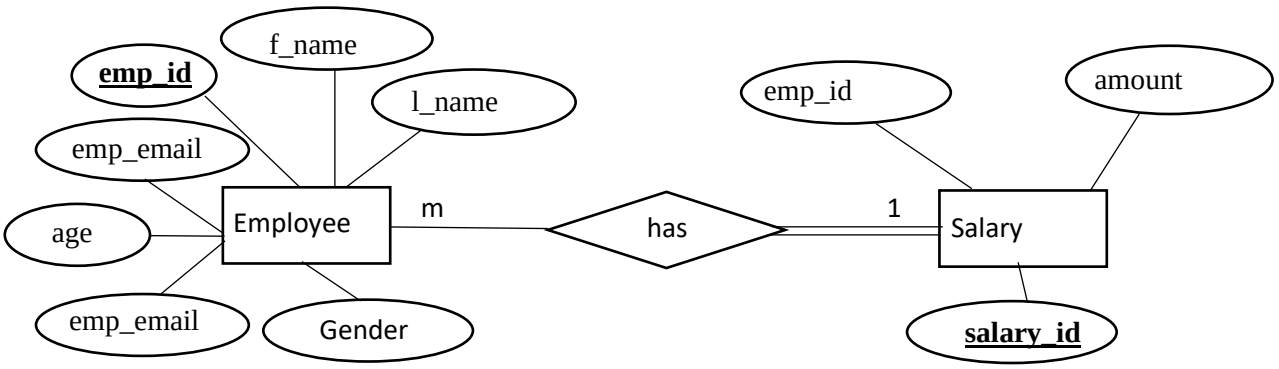
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email;depart_id	Employee **works for** department.	emp_id	depart_id
department	depart_id; depart_name	Department works by employee.	depart_id	



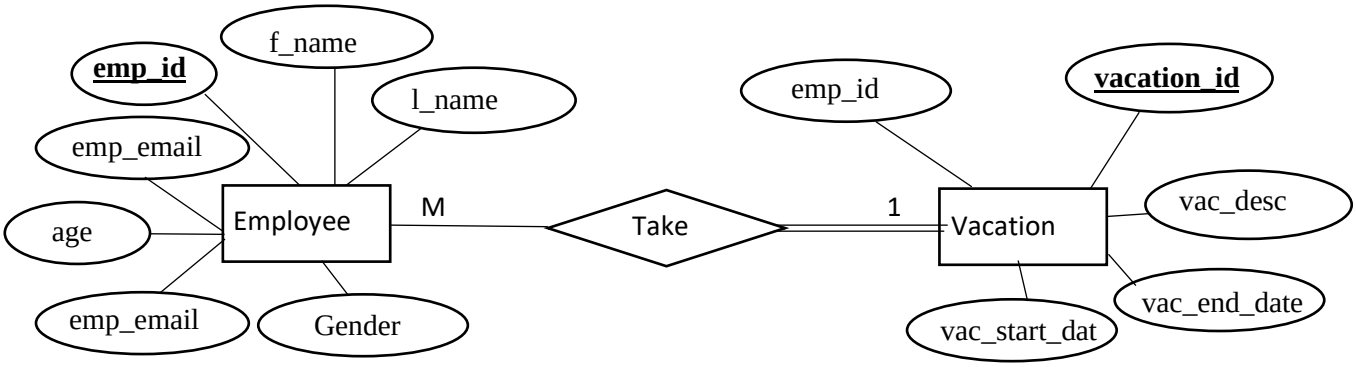
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email; pro_id	Employee **works on** project.	emp_id	pro_id
project	pro_id; pro_name; pro_details; emp_id	Project works by employee.	pro_id	emp_id



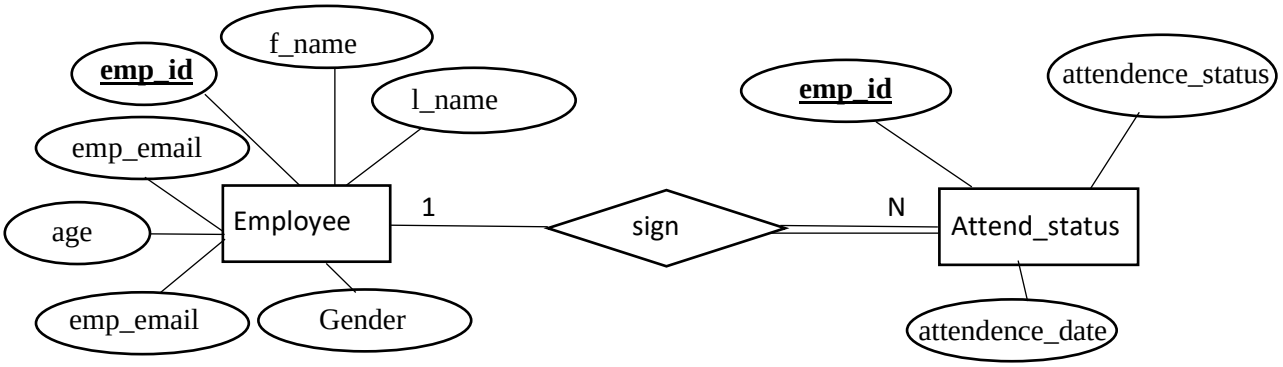
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email; role_id	Employee **stick on** role.	emp_id	role_id
Roles	role_id; role_name; role_desc	Role sticked by employee.	role_id	



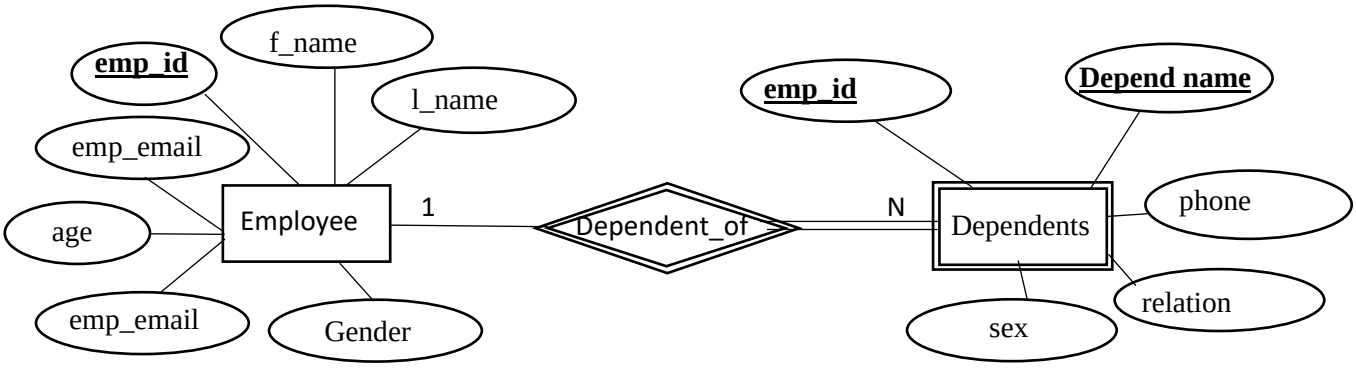
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email	Employee **has** salary.	emp_id	
salary	salary_id; amount; emp_id	Salary owned by employee.	salary_id	emp_id



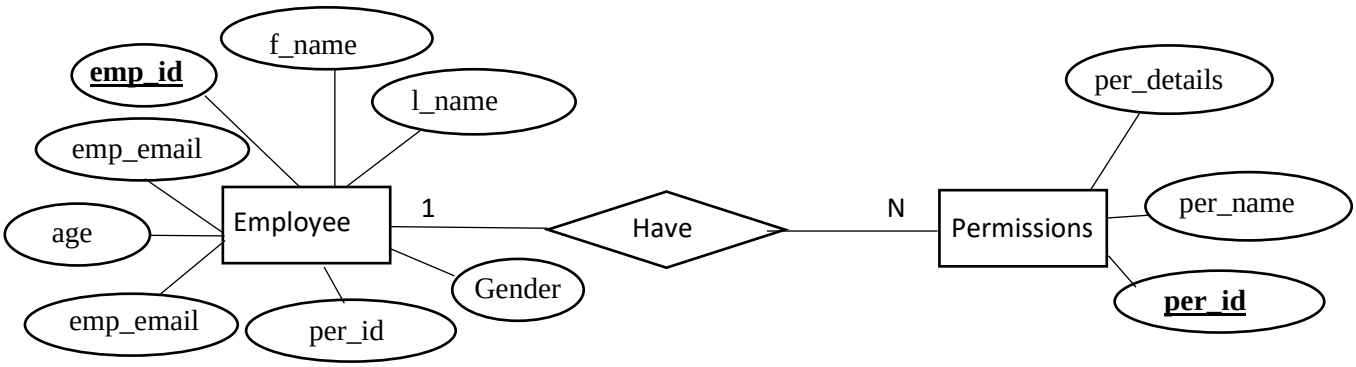
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email	Employee take vacation.	emp_id	
vacation	vacation_id; vac_start_date; vac_end_date; vac_desc; emp_id	Vacation taken by employee.	vacation_id	emp_id



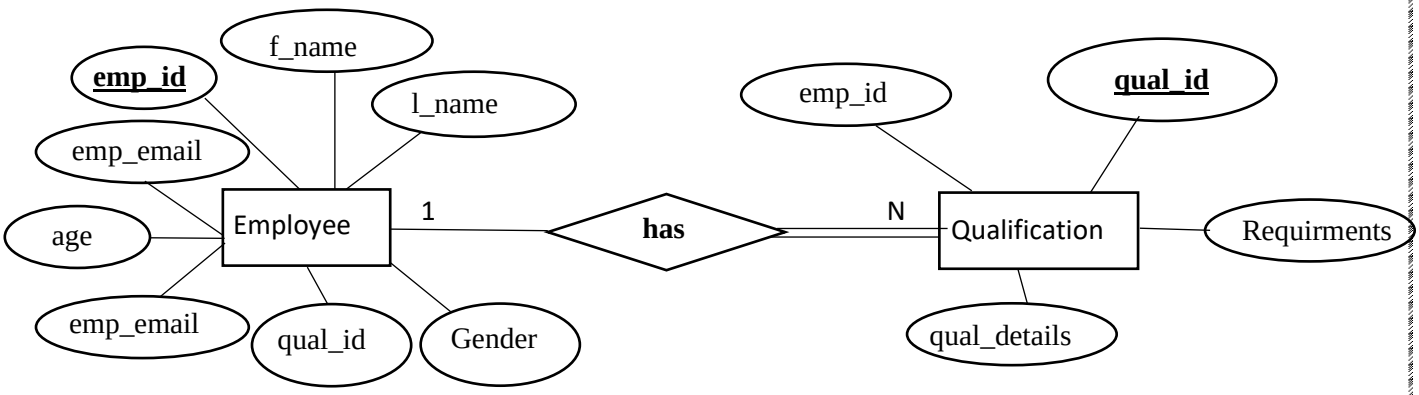
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email	Employee **sign** attendance_status.	emp_id	
attendence_status	attendence_status; attendence_date; emp_id	Attendance signed by employee.	emp_id	emp_id



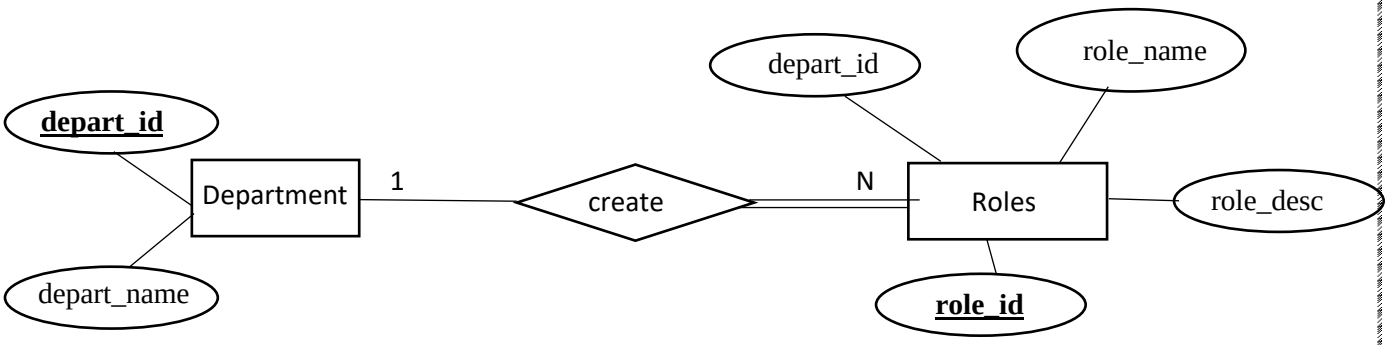
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email	Employee **dependent of** dependent	emp_id	
dependent	depend_name; phone; relation; sex; emp_id	(Dependents) Dependent of employee.	emp_id,depend_name	emp_id



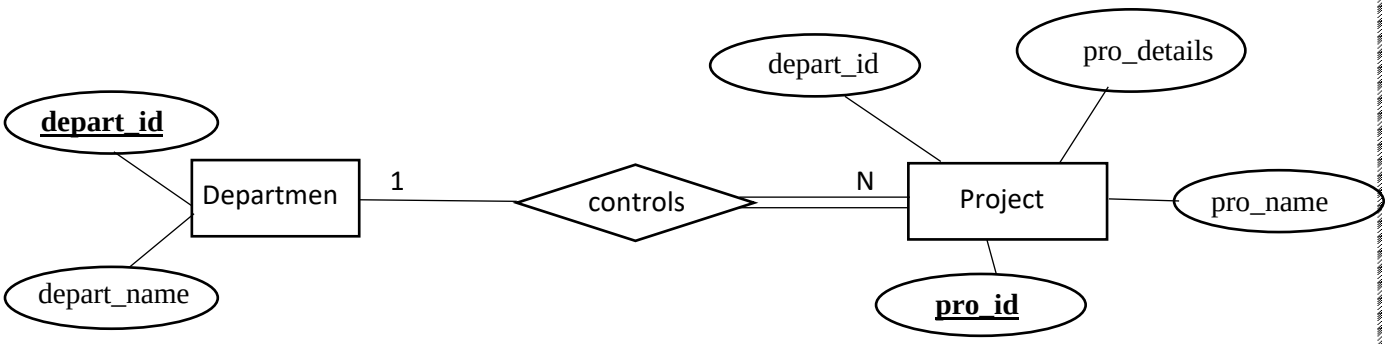
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email; per_id	employee have permission.	emp_id	per_id
permission	per_id; per_name; per_details	permission belong to employee.	per_id	



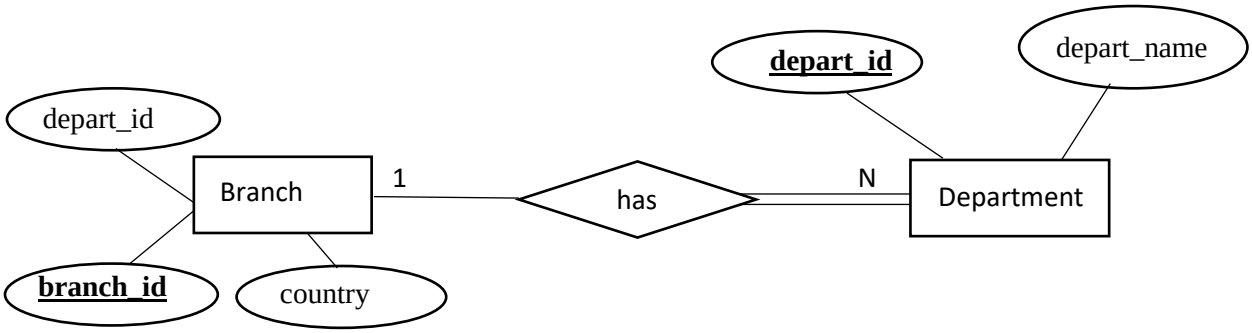
Entities	Attributes	Relationship	Primary Key	Foreign
employee	emp_id; f_name; l_name; gender; age; emp_email; qual_id	Employee **has** qualification.	emp_id	qual_id
qualification	qual_id; qual_details; Requirments; emp_id	Qualification belong to employee.	qual_id	emp_id



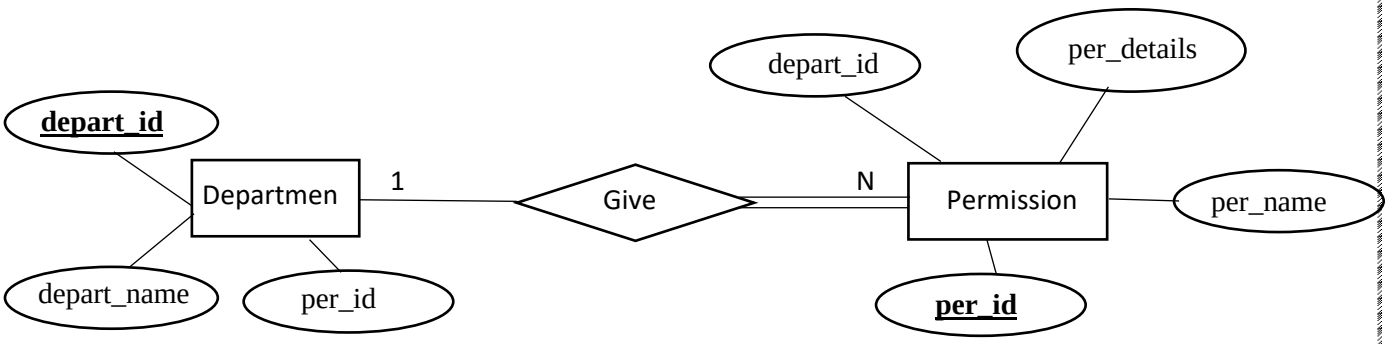
Entities	Attributes	Relationship	Primary Key	Foreign
Department	depart_id; depart_name	Department create roles.	depart_id	
Roles	role_id; role_name; role_desc	Role created by department.	role_id	depart_id



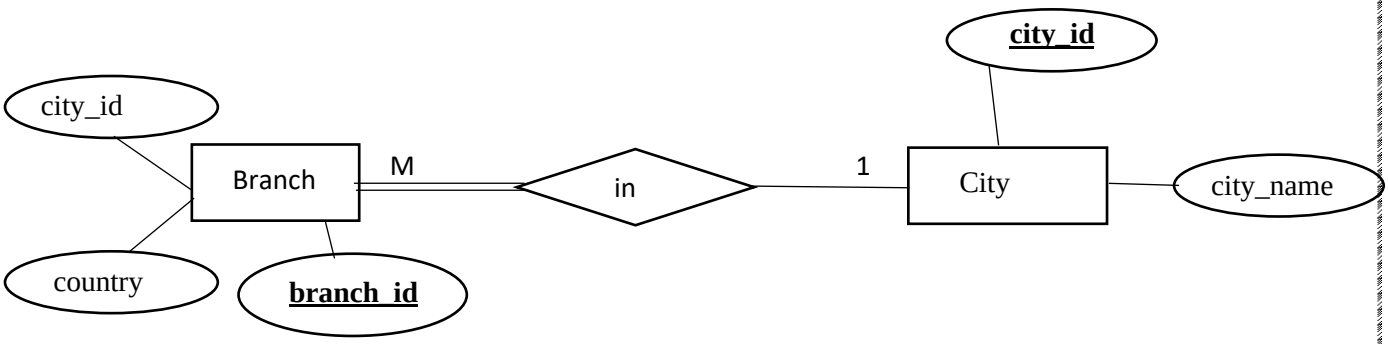
Entities	Attributes	Relationship	Primary Key	Foreign
Department	depart_id; depart_name	Department control project.	depart_id	
project	pro_id; pro_name; pro_details; depart_id	Project controlled by department.	pro_id	depart_id



Entities	Attributes	Relationship	Primary Key	Foreign
Department	depart_id; depart_name	department belongs to the branch	depart_id	
branch	branch_id; country; depart_id	Branch has department.	branch_id	depart_id

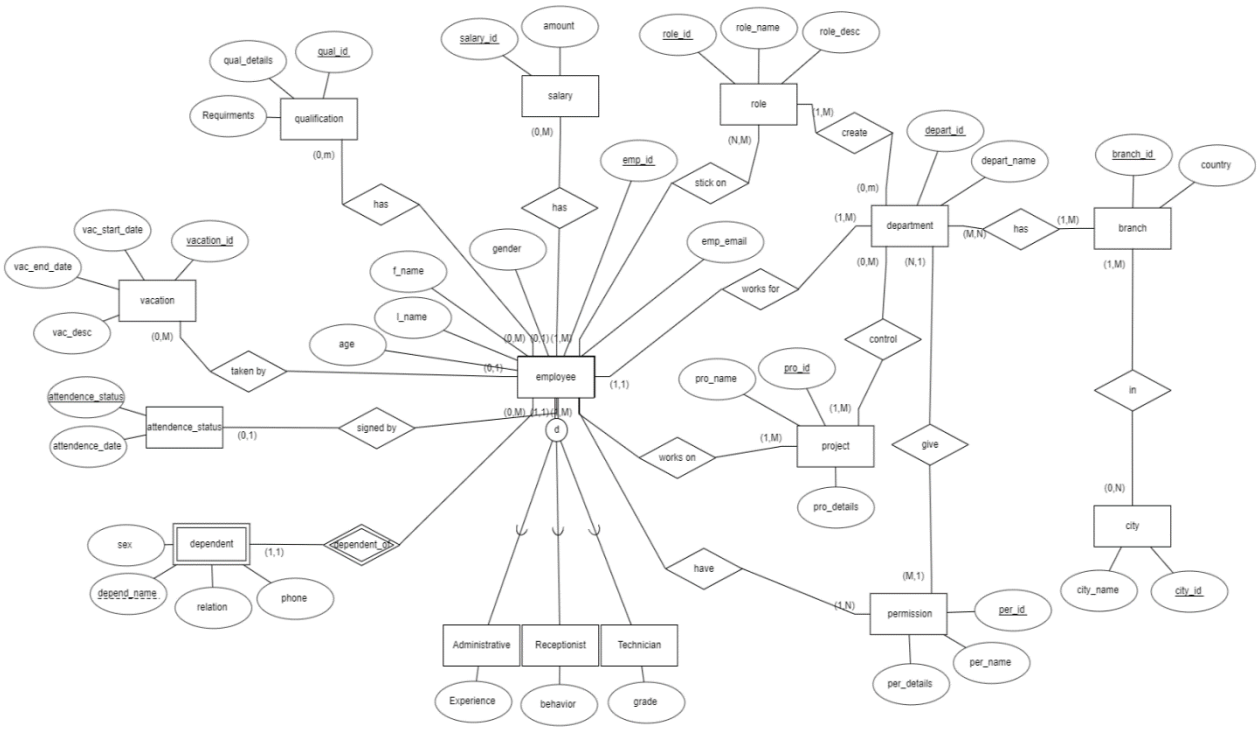


Entities	Attributes	Relationship	Primary Key	Foreign
Department	depart_id; depart_name; per_id	Department give permission.	depart_id	per_id
permission	per_id; per_name; per_details; depart_id	permission given by department.	per_id	depart_id



Entities	Attributes	Relationship	Primary Key	Foreign
branch	branch_id; country; city_id	Branch inside city.	branch_id	city_id
city	city_id; city_name	City have branchs.	city_id	

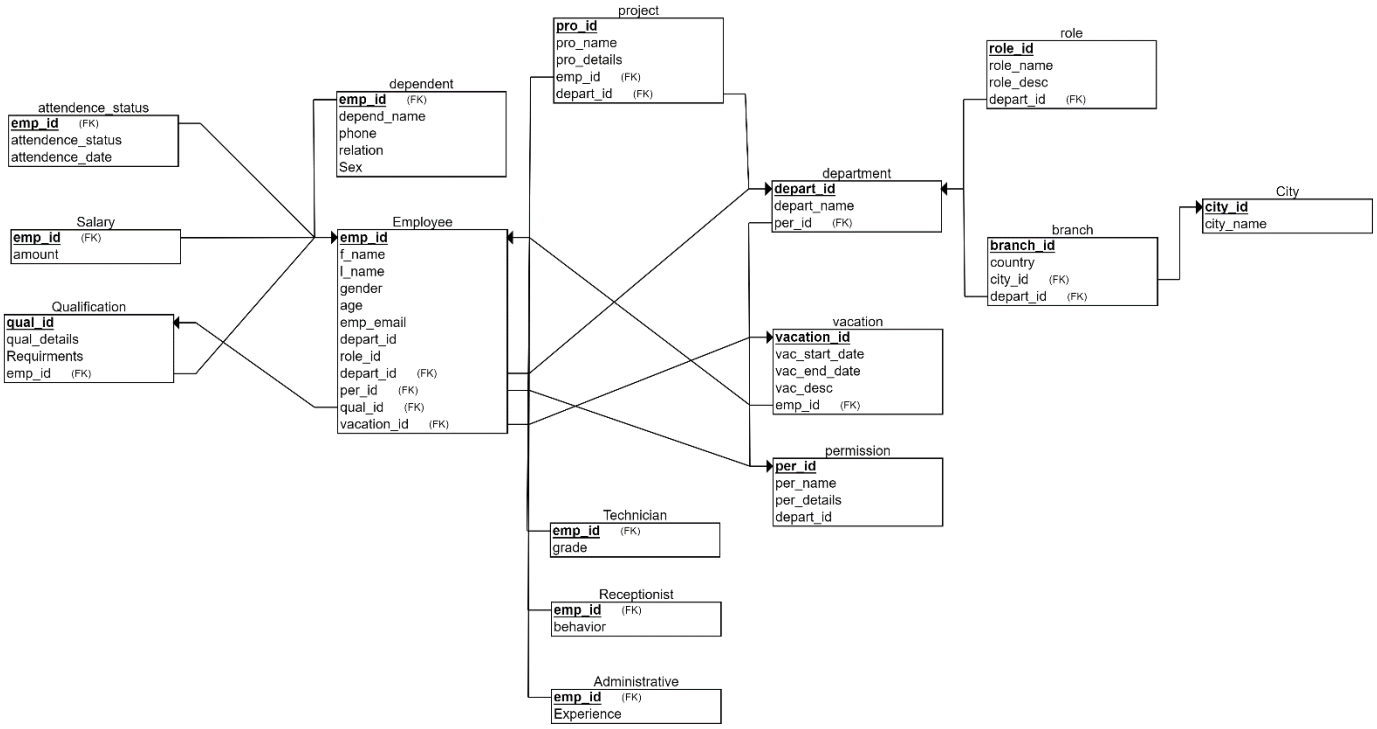
The following ER diagram was made in (ERDPLUS):



- **Superclass and Subclasses**

Entities	Attributes	Relationship	Primary Key	Foreign
Administrative	Experience	Sub-class for employee.	emp_id	emp_id
Receptionist	behavior	Sub-class for employee.	emp_id	emp_id
Technician	grade	Sub-class for employee.	emp_id	emp_id
employee	emp_id; f_name; l_name; gender; age; emp_email	**Super class** for Administrative, Receptionist, Technician.	emp_id	depart_id; per_id; role_id

Part 4: Physical Model (Mapping)



Entity Type: **Employee**		
Attributes	**Data Type**	**Required/Optional**
Emp_ID	Number(6)	Required
F_Name	Varchar2(30)	Required
L_name	Varchar2(30)	Required
gender	Varchar2(10)	Required
Age	Number(2)	Required
Emp_email	Varchar2(50)	Optional
Depart_ID	Number(6)	Optional
Per_ID	Number(6)	Optional
Role_ID	Number(6)	Optional

Entity Type: **Department**

Attribute	Data Type	Required/Optional
Depart-ID	Integer (10)	Required
Depart_Name	Varchar(50)	Required

Entity Type: **Role**

Attributes	Data Type	Required/Optional
Role_id	Number(6)	Required
Role_Name	Varchar2(20)	Required
Role_desc	Varchar2(140)	Optional
Depart_id	Number(6)	Required

Entity Type: **Permission**

Attribute	Data Type	Required/Optional
Per_id	Number(6)	Required
Per_name	Varchar2(20)	Required
Per_details	Varchar2(70)	Optional
Depart_id	Number(6)	Required

Entity Type: **Salary**

Attribute	Data Type	Required/Optional
Emp_ID	Number(6)	Required
Amount	Number(7,2)	Optional

Entity Type: **Project**

Attribute	Data Type	Required/Optional
Pro_id	Number(6)	Required
Pro_name	Varchar2(30)	Required
Pro_details	Varchar2(140)	Optional
Emp_id	Number(6)	Optional
Depart_id	Number(6)	Optional

Entity Type: **Dependent**		
Attribute	**Data Type**	**Required/Optional**
Emp_id	Number(6)	Required
Depend_name	Varchar2(20)	Required
Phone	Varchar2(15)	Optional
Relation	Number(60)	Required
Sex	Varchar2(8)	Required
Entity Type: **Administrative**		
Attribute	**Data Type**	**Required/Optional**
Emp_id	Number(6)	Required
Experience	Varchar2(100)	Optional
Entity Type: **Receptionist**		
Attribute	**Data Type**	**Required/Optional**
Emp_id	Number(6)	Required
Behavior	Varchar2(80)	Optional
Entity Type: **Technician**		
Attribute	**Data Type**	**Required/Optional**
Emp_id	Number(6)	Required
Grade	Number(3,2)	Required
Entity Type: **Qualification**		
Attribute	**Data Type**	**Required/Optional**
Qual_id	Number(6)	Required
Qual_details	Varchar2(200)	Optional
Requirments	varchar2(90)	Optional
Emp_id	Number(6)	Required
Entity Type: **Attendence_Status**		
Attribute	**Data Type**	**Required/Optional**
Emp_id	Number(6)	Required
attendence_status	Varchar2(20)	Required
attendence_date	Date	Required
Entity Type: **Vacation**		
Attribute	**Data Type**	**Required/Optional**
vacation_id	Number(6)	Required
Emp_id	Number(6)	Required
Vac_start_date	Varchar2(20)	Required
Vac_end_date	Varchar2(70)	Required
Vac_desc	Number(6)	Required

Entity Type: **City**		
Attribute	**Data Type**	**Required/Optional**
City_id	Number(6)	Required
City_name	Varchar2(20)	Required
Entity Type: **Branch**		
Attribute	**Data Type**	**Required/Optional**
Branch_id	Number(6)	Required
City_id	Number(6)	Required
Country	Varchar2(50)	Required
Depart_id	Number(6)	Optional

Part 5: Implementation of Physical Model

Table: CITY

```
1  create table city(
2  city_id number(6),
3  city_name varchar2(30) not null,
4  constraint pk_city_id primary key(city_id)
5  );
```

==========

Table: DEPARTMENT

```
35  create table department(
36  depart_id number(6) primary key,
37  depart_name varchar(40) not null
38  );
```

==========

Table:BRANCH

```
22  create table branch(
23  branch_id number(6),
24  city_id number(6) not null,
25  country varchar2(50) not null,
26  depart_id number(6),
27  constraint pk_branch_id primary key(branch_id),
28  constraint fk_city_id_branch foreign key(city_id)
29  references city(city_id),
30  constraint fk_depart_id_branch foreign key(depart_id)
31  references department(depart_id)
32  );
```

==========

Table: ROLE

```
47  create table role(
48  role_id number(6),
49  role_name varchar2(20) not null,
50  role_desc varchar(140),
51  depart_id number(6),
52  constraint pk_role_id primary key(role_id),
53  CONSTRAINT FK_depart_id_role FOREIGN KEY (depart_id)
54  REFERENCES department(depart_id)
55  );
```

==========

Table:PERMISSION

```
64  create table permission(
65  per_id number(6) primary key,
66  per_name varchar2(20) not null,
67  per_details varchar2(70),
68  depart_id number(6),
69  CONSTRAINT FK_depart_id_perm FOREIGN KEY (depart_id)
70  REFERENCES department(depart_id)
71  );
```

==========

Table: EMPLOYEE

```
78  create table employee(
79  emp_id number(6) primary key,
80  f_name varchar2(30) not null,
81  l_name varchar2(30) not null,
82  gender varchar2(10) not null,
83  age number(2) not null,
84  emp_email varchar2(50) unique,
85  depart_id number(6),
86  per_id number(6) ,
87  role_id number(6),
88  constraint fk_depart_id_emp foreign key(depart_id)
89  references department(depart_id),
90  constraint fk_per_id_emp foreign key(per_id)
91  references permission(per_id),
92  constraint fk_role_id_emp foreign key(role_id)
93  references role(role_id)
94  );
```

==========

Table: SALARY

```
112 create table salary(
113 emp_id number(6) primary key,
114 amount number(7,2),
115 constraint fk_emp_id_salary foreign key(emp_id)
116 references employee(emp_id)
117 );
```

==========

Table: PROJECT

```
132 create table project(
133 pro_id number(6),
134 pro_name varchar2(30) not null,
135 pro_details varchar2(140),
136 emp_id number(6),
137 depart_id number(6),
138 constraint pk_pro_id primary key(pro_id),
139 constraint fk_emp_id_pro foreign key(emp_id)
140 references employee(emp_id),
141 constraint fk_depart_id_pro foreign key(depart_id)
142 references department(depart_id)
143 );
```

==========

Table: DEPENDENT

```
153  create table dependent(
154  emp_id number(6),
155  depend_name varchar2(20) not null,
156  phone varchar2(15),
157  relation varchar2(60) not null,
158  sex varchar2(8),
159  constraint pk_emp_id_depend_name primary key(emp_id,depend_name),
160  constraint fk_emp_id_depend foreign key(emp_id)
161  references employee(emp_id)
162  );
163  describe dependent
```

==========

Table: ADMINISTRATIVE

```
165  create table Administrative(
166  emp_id number(6),
167  Experience varchar2(100),
168  constraint PK_emp_id primary key(emp_id),
169  constraint FK_emp_id_admin foreign key (emp_id)
170  references employee(emp_id)
171  );
```

==========

Table: RECEPTIONIST

```
177  create table Receptionist(
178  emp_id number(6) ,
179  behavior varchar2(80),
180  constraint PK_emp_id2 primary key(emp_id),
181  constraint FK_emp_id_recept foreign key (emp_id)
182  references employee(emp_id)
183  );
```

==========

Table: TECHICIAN

```
188  create table Technician(
189  emp_id number(6),
190  grade number(3,2),
191  constraint PK_emp_id3 primary key(emp_id),
192  constraint FK_emp_id_tech foreign key (emp_id)
193  references employee(emp_id)
194  );
```

==========

Table: QUALIFICATION

```
200  create table qualification(
201  qual_id number(6) primary key,
202  qual_details varchar2(200),
203  Requirments varchar2(90),
204  emp_id number(6),
205  CONSTRAINT FK_emp_id_qual FOREIGN KEY (emp_id)
206  REFERENCES employee(emp_id)
207  );
```

==========

Table: ATTENDENCE_STATUS

```
211  create table attendence_status(
212  emp_id number(6) primary key,
213  attendence_status varchar2(20)not null,
214  attendence_date date not null,
215  constraint fk_emp_id_attend foreign key(emp_id)
216  references employee(emp_id),
217  constraint check_attendence_status check(attendence_status = 'Present' or  attendence_status = 'Absent')
218  );
```

==========

Table: VACATION

```
237  create table vacation(
238  vacation_id number(6) primary key,
239  emp_id number(6) not null,
240  vac_start_date date not null,
241  vac_end_date date not null,
242  vac_desc varchar(200) not null,
243  constraint fk_emp_id_vacat foreign key(emp_id)
244  references employee(emp_id)
245  );
```

Part 6: Design queries

Queries for City:

```
266 select * from city;
```

CITY_ID	CITY_NAME
123	Riyadh
124	Washington
125	Sacramento

Download CSV
3 rows selected.

```
268 select CITY_ID,CITY_NAME
269 from city
270 where CITY_NAME = 'Riyadh';
```

CITY_ID	CITY_NAME
123	Riyadh

Download CSV

==========

Queries for Branch:

```
272 select * from branch;
```

BRANCH_ID	CITY_ID	COUNTRY
2221	123	SA
2222	124	US
2223	125	CA

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3 rows selected.

```
272 select * from branch;
273
274 select * from branch
275 where COUNTRY = 'SA' or COUNTRY = 'US';
```

BRANCH_ID	CITY_ID	COUNTRY
2221	123	SA
2222	124	US

Download CSV
2 rows selected.

==========

Queries for department:

```
277 select * from department;
278
```

DEPART_ID	DEPART_NAME
112233	Marketing and sales
112244	Human resources
112255	Research and development

Download CSV
3 rows selected.

```
279 SELECT depart_id , COUNT(*) AS "Number of Employees"
280 FROM department  natural  join  employee
281 GROUP BY depart_id
```

DEPART_ID	Number of Employees
112244	4
112233	3

Download CSV
2 rows selected.

==========

Queries for Role:

```
282
283 select * from role;
284
```

ROLE_ID	ROLE_NAME	ROLE_DESC	DEPART_ID
1	privacy	You should not interfere in the affairs of your colleagues unless you are managing them	112233
2	respect	All employees must respect each other	112244
3	TeamWork	A prerequisite for the success of work is teamwork	112255

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3 rows selected.

```
285 select * from role
286 where role_name like 'Team____'
```

ROLE_ID	ROLE_NAME	ROLE_DESC	DEPART_ID
3	TeamWork	A prerequisite for the success of work is teamwork	112255

Download CSV

==========

Queries for permission:

```
288 select * from permission;
```

PER_ID	PER_NAME	PER_DETAILS	DEPART_ID
123	Recruit	He has the power to hire	112233
124	Recruit	He has the Power to fire employees	112244

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2 rows selected.

```
290 select DEPART_name , per_name
291 from department d left outer join permission p
292 on d.DEPART_ID = p.DEPART_ID
```

DEPART_NAME	PER_NAME
Marketing and sales	Recruit
Human resources	Recruit
Research and development	-

Download CSV
3 rows selected.

==========

Queries for employee:

```
295  select * from employee;
296
```

EMP_ID	F_NAME	L_NAME	GENDER	AGE	EMP_EMAIL	DEPART_ID	PER_ID	ROLE_ID
1234	Fahad	khalid	Male	20	fahad@gmail.com	112233	-	-
1235	Norah	mostafa	Female	23	norah@gmail.com	112233	-	-
1236	Saad	mohammed	Male	27	saad@gmail.com	112233	-	-
1237	Nasser	saad	Male	21	Nasser@gmail.com	112244	-	-
1238	Amira	nawaf	Female	23	Amira@gmail.com	112244	-	-
1239	Rayan	yazeed	Male	27	Rayan@gmail.com	112244	-	-
1240	Manar	abdullrahman	Female	23	Manar@gmail.com	112244	-	-

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7 rows selected.

```
297  select emp_id,f_name ,l_name,DEPART_NAME , ROLE_NAME
298  from employee e , department d , role r
299  where e.DEPART_ID = d.DEPART_ID and d.DEPART_ID = r.DEPART_ID
300  and gender = 'Male'
301
```

EMP_ID	F_NAME	L_NAME	DEPART_NAME	ROLE_NAME
1234	Fahad	khalid	Marketing and sales	privacy
1236	Saad	mohammed	Marketing and sales	privacy
1237	Nasser	saad	Human resources	respect
1239	Rayan	yazeed	Human resources	respect

Download CSV
4 rows selected.

==========

Queries for ADMINISTRATIVE :

```
312  select * from Administrative;
```

EMP_ID	EXPERIENCE
1234	provide support for a company

Download CSV

```
314  select f_name , l_name , EXPERIENCE
315  from employee e , Administrative a
316  where e.EMP_ID = a.EMP_ID
```

F_NAME	L_NAME	EXPERIENCE
Fahad	khalid	provide support for a company

Download CSV

==========

Queries for salary:

```
301
302  select * from salary;
```

EMP_ID	AMOUNT
1234	2000.24
1235	10000.24
1236	20500.24
1237	15000
1238	4000
1239	6000

Download CSV
6 rows selected.

```
304  select f_name , l_name , gender ,age , depart_id , amount as "amount of salary"
305  from employee e , salary s
306  where e.EMP_ID = s.EMP_ID
```

F_NAME	L_NAME	GENDER	AGE	DEPART_ID	amount of salary
Fahad	khalid	Male	20	112233	2000.24
Norah	mostafa	Female	23	112233	10000.24
Saad	mohammed	Male	27	112233	20500.24
Nasser	saad	Male	21	112244	15000
Amira	nawaf	Female	23	112244	4000
Rayan	yazeed	Male	27	112244	6000

Download CSV
6 rows selected.

```
308  select f_name , l_name , gender ,age , depart_id , amount as "amount of salary"
309  from employee e , salary s
310  where e.EMP_ID = s.EMP_ID and age >23 and amount <10000
```

F_NAME	L_NAME	GENDER	AGE	DEPART_ID	amount of salary
Rayan	yazeed	Male	27	112244	6000

Download CSV

==========

Queries for attendemce_status:

```
323
324  select * from attendence_status;
```

EMP_ID	ATTENDENCE_STATUS	ATTENDENCE_DATE
1234	Present	06-MAY-22
1235	Absent	06-MAY-22
1236	Present	06-MAY-22
1237	Present	06-MAY-22
1238	Absent	06-MAY-22
1239	Present	06-MAY-22
1240	Absent	07-MAY-22

Download CSV
7 rows selected.

```
325
326  select f_name , l_name , ATTENDENCE_STATUS ,ATTENDENCE_DATE
327  from employee natural join attendence_status
328  where ATTENDENCE_STATUS= 'Present' and age <27
```

F_NAME	L_NAME	ATTENDENCE_STATUS	ATTENDENCE_DATE
Fahad	khalid	Present	06-MAY-22
Nasser	saad	Present	06-MAY-22

Download CSV
2 rows selected.

==========

Queries for vacation:

```
331  select * from vacation;
```

VACATION_ID	EMP_ID	VAC_START_DATE	VAC_END_DATE	VAC_DESC
2001	1240	06-MAY-22	08-MAY-22	a medical excuse
2002	1234	08-MAY-22	23-MAY-22	Traffic accident
2004	1239	25-MAY-22	28-MAY-22	for the circumstance of death
2003	1237	06-MAY-22	08-JUN-22	continuation of study

Download CSV
4 rows selected.

```
332
333  select * from vacation
334  where VAC_START_DATE between '02-MAY-22' and '13-MAY-22';
335
```

VACATION_ID	EMP_ID	VAC_START_DATE	VAC_END_DATE	VAC_DESC
2001	1240	06-MAY-22	08-MAY-22	a medical excuse
2002	1234	08-MAY-22	23-MAY-22	Traffic accident
2003	1237	06-MAY-22	08-JUN-22	continuation of study

Download CSV
3 rows selected.

```
336  select * from vacation
337  where VAC_DESC like '%accident%';
338
```

VACATION_ID	EMP_ID	VAC_START_DATE	VAC_END_DATE	VAC_DESC
2002	1234	08-MAY-22	23-MAY-22	Traffic accident

Download CSV

==========

Queries for project:

```
338
339  select * from project
```

PRO_ID	PRO_NAME	PRO_DETAILS	EMP_ID	DEPART_ID
11	Research	-	1234	-
22	Manufacturing	-	1235	-
33	Management	-	1236	-

Download CSV
3 rows selected.

```
341  select * from project
342  where PRO_NAME like 'R%';
```

PRO_ID	PRO_NAME	PRO_DETAILS	EMP_ID	DEPART_ID
11	Research	-	1234	-

Download CSV

Thank You