Document #3
Final Write-up with Queries and Results

Submitted By: Akansha Jain, Shraddha Revar

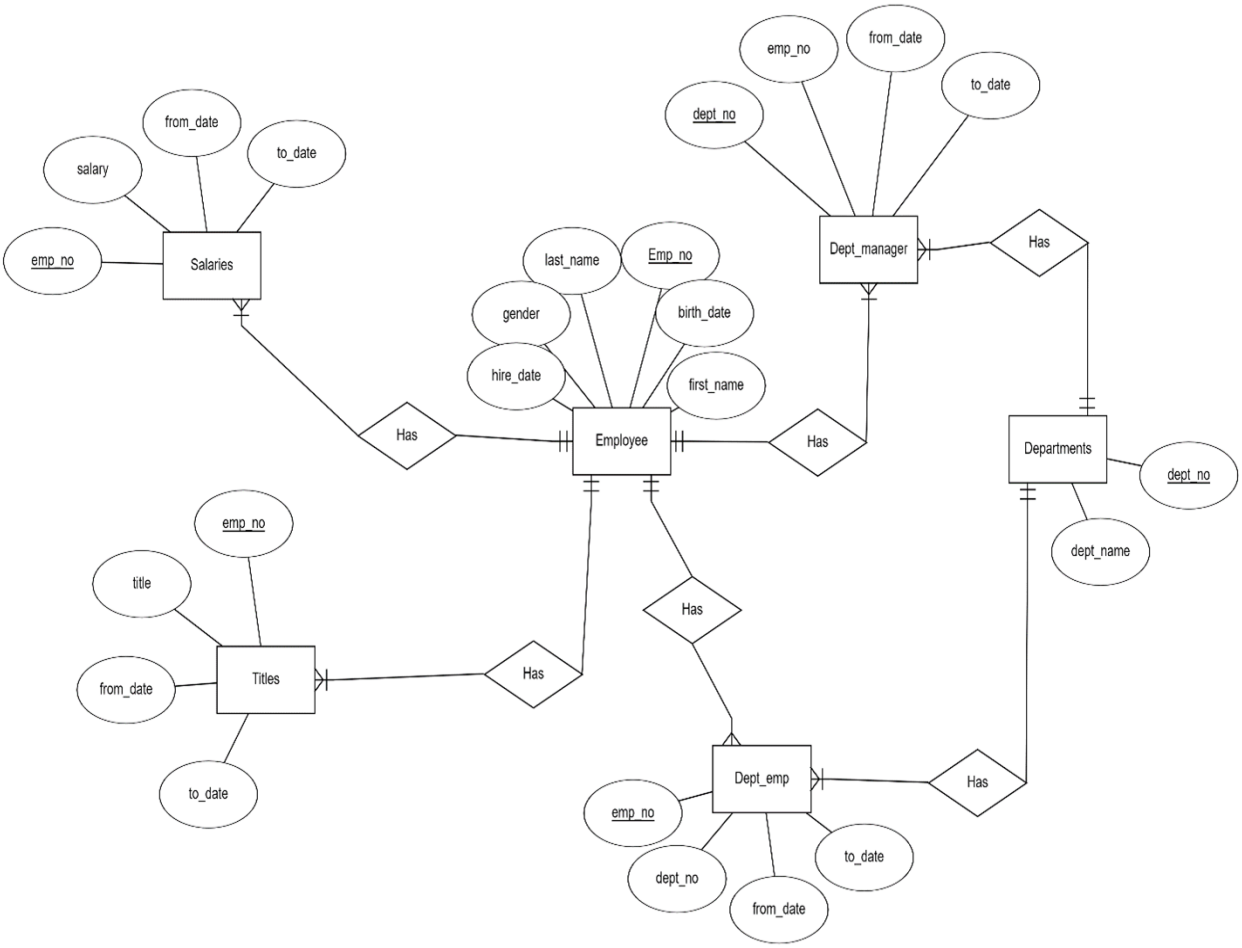
1. Your ER diagram, showing any changes you made during the implementation process

ER-Diagram for the Schema Employee:

We didn't made any changes in the ER Diagram.

In this ER Diagram we have 6 tables:

Employee, Salaries, Titles, Departments, Dept_emp, Dept_manager



2. The CREATE TABLE statements for your database

Table "employees"

```
CREATE TABLE employees (
 emp_no INT NOT NULL,
 birth_date DATE NOT NULL,
 first_name VARCHAR(14) NOT NULL,
 last_name VARCHAR(16) NOT NULL,
 gender gender NOT NULL,
 hire_date DATE NOT NULL,
 PRIMARY KEY (emp_no));
```

For the data type gender, we have created this gender data type as Enum with the values (M, F).

Table "departments"

```
CREATE TABLE departments (
 dept_no CHAR(4) NOT NULL,
 dept_name VARCHAR(40) unique NOT NULL,
 PRIMARY KEY (dept_no));
```

Table "dept_emp"

Junction table to support many-to-many relationship between employees and departments. A department has many employees. An employee can belong to different departments at different dates, and possibly concurrently.

```
CREATE TABLE dept_emp (
 emp_no INT NOT NULL,
 dept_no CHAR(4) NOT NULL,
 from_date DATE NOT NULL,
 to_date  DATE NOT NULL,
```

```
FOREIGN KEY (emp_no) REFERENCES employees (emp_no),
FOREIGN KEY (dept_no) REFERENCES departments (dept_no),
PRIMARY KEY (emp_no, dept_no));
```

Table "dept_manager"

join table to support many-to-many relationship between employees and departments. Same structure as dept_emp.

```
CREATE TABLE dept_manager (
dept_no      CHAR(4)  NOT NULL,
emp_no       INT      NOT NULL,
from_date    DATE  NOT NULL,
to_date      DATE     NOT NULL,
KEY          (emp_no),
KEY          (dept_no),
FOREIGN KEY (emp_no)  REFERENCES employees (emp_no),
FOREIGN KEY (dept_no) REFERENCES departments (dept_no),
PRIMARY KEY (emp_no, dept_no));
```

Table "titles"

There is a one-to-many relationship between employees and titles. One employee has many titles (concurrently or at different dates). A title record refers to one employee (via emp_no).

```
CREATE TABLE titles (
 emp_no  INT NOT NULL,
 title VARCHAR(50) NOT NULL,
 from_date DATE NOT NULL,
 to_date DATE,
 KEY (emp_no),
 FOREIGN KEY (emp_no) REFERENCES employees (emp_no),
 PRIMARY KEY (emp_no, title, from_date));
```

Table "salaries"

One-to-many relationship between employees and salaries.

```
CREATE TABLE salaries (
 emp_no  INT NOT NULL,
 salary INT NOT NULL,
 from_date DATE  NOT NULL,
 to_date DATE NOT NULL,
 KEY (emp_no),
 FOREIGN KEY (emp_no) REFERENCES employees (emp_no),
 PRIMARY KEY (emp_no, from_date));
```

3. A brief description of how you populated the database

We have used Github for the data source. We have downloaded the data from Github and then we sort the data according to our preference and then uploaded the data in the .csv file format.

For some rows we have manually entered the data using the Insert statement which we needed.

4. For each of your 20 questions, the question in English, its translation to SQL and the (full) answer to the query. (If you needed to change any of your original questions, also list the originals and why you needed to change or replace them.)

List of 20 questions:

1. List all the employees whose name start with ‘D’
   ANSWER:

   Select first_name from employees where first_name like 'D%';

first_name
Duangkaew
Divier
Domenick
Danel
Dung
Dayanand
Domenick
Diederik
Douadi
Debatosh
Duangkaew
Dharmaraja

   No of rows: 106 rows

2. List all the first names of employees from the Human Resource department.

   ANSWER:

   Select first_name from employees e

   inner join dept_emp de on e.emp_no=de.emp_no

   inner join departments d on de.dept_no=d.dept_no

   where d.dept_name = 'Human Resources';

first_name
Kyoichi
Eberhardt
Adamantios
Alejandro
Mayumi
Hisao
Mona
Premal
Somnath
Hironobu
Hironoby
Lunjin
Xuejia
Marla
Karsten
Lein
Stabislas
Arunachalam
Moto

No of rows:187 rows

3. List the name of the employee from the production department who works as senior engineer.

   ANSWER:

   Select e.first_name from employees e

   inner join dept_emp de on e.emp_no=de.emp_no

   inner join departments d on de.dept_no=d.dept_no

   inner join title t on e.emp_no=t.emp_no

   where d.dept_name='Human resources' AND t.title='Senior Engineer';

first_name
Parto
Chirstian
Kazuhide
Yongqiao
Otmar
Elvis
Jeong
Alain
Zvonko
Hidefumi
Gino
Zhongwei
Vishv
Tuval

   No of rows:433 rows

4. List the last name of the employee whose salary is greater than 70000.

ANSWER:

Select distinct e.last_name from employees e inner join salaries s on

e.emp_no = s.emp_no where s.salary>70000;

last_name
Breugel
Spinelli
DasSarma
Ariola
Cronau
Naudin
Figueira
Fargier
Muniz
Kambil
Hiraishi
Jonsson
Camurati
Bruckman

No of rows:937 rows

5. List all the employees with the title ‘engineer’ that have been engineer from 1996.

   ANSWER:

   Select e.first_name from employees e inner join titles t on

   e.emp_no=t.emp_no

   where t.from_date>'1996-01-01' AND t.tile='Engineer';

first_name
Duangkaew
Mayuko
Shahaf
Bojan
Moss
Satosi
Shir
Valdiodio
Jayson
Paraskevi
Akemi
Jaewon
Armond
Hinrich
Magdalena
Nathan

No of rows:346 rows

6. List all the employees whose name ends with A.

ANSWER:

Select distinct first_name from employees where first_name like'%A';

first_name
DAIDA

1 row(s)

Total runtime: 2.863 ms

SQL executed.

No of rows:1 row

7. List name and hire date of all the employees from the Sales department.

ANSWER:

Select e.first_name,e.hire_date from employees e inner join

dept_emp dp on e.emp_no=dp.emp_no inner join

departments d on dp.dept_no=d.dept_no

where d.dept_name='Sales';

first_name	hire_date
Bezalel	1985-11-21
Kazuhito	1995-01-27
Bader	1988-09-21
Uri	1989-11-12
Yinghua	1990-12-25
Sanjiv	1986-02-04
Breannda	1987-11-02
Tse	1985-09-17
Charlene	1987-08-07
Xinglin	1986-09-08
Jungsoon	1988-09-02
Sudharsan	1986-08-12
Sailaja	1996-11-05
Hilari	1986-07-15
Valter	1988-10-18
Perla	1992-12-28

No of rows:542 rows

8. List all the employees whose birth date is after 1-9-1958.
   ANSWER:

   select first_name,last_name from employees where birth_date>'1958-01-09';

first_name	last_name
Bezalel	Simmel
Parto	Bamford
Saniya	Kalloufi
Duangkaew	Piveteau
Patricio	Bridgland
Eberhardt	Terkki
Guoxiang	Nooteboom
Kazuhito	Cappelletti
Cristinel	Bouloucos
Ramzi	Erde
Suzette	Pettey
Prasadram	Heyers
Divier	Reistad
Domenick	Tempesti
Elvis	Demeyer
Karsten	Joslin

   No of rows:1610 rows

9. List the employee sum of the salaries gender wise.
   ANSWER:

   select e.gender,sum(s.salary) as "total salary gender wise"

   from salaries s inner join employees e on

   s.emp_no=e.emp_no

   group by e.gender;

gender	total salary gender wise
M	1119880300
F	746840431

   2 row(s)

   Total runtime: 27.303 ms

   SQL executed.

   No of rows:2 rows

10. Count no of employees who works under the title staff.

    ANSWER:

    Select count(title) from titles where title='Staff';

Total Staff
1112

1 row(s)

Total runtime: 5.384 ms

SQL executed.

11. Display all the employees with their title and salaries.

    ANSWER:

    select distinct e.first_name,t.title,s.salary from employees e

    inner join titles t on e.emp_no=t.emp_no

    inner join salaries s on e.emp_no=s.emp_no;

first_name	title	salary
Pradeep	Staff	46935
Uri	Staff	72348
Arunas	Staff	77063
Oguz	Engineer	55456
Arto	Staff	59097
Moriyoshi	Senior Engineer	67049
Chirstian	Senior Engineer	60770
Sarita	Senior Engineer	58015
Filipe	Engineer	44114
Shirish	Engineer	51187
Yunming	Senior Engineer	93033
Anneke	Senior Staff	76814
Flemming	Senior Engineer	44152
Muzhong	Senior Staff	68213
Kensyu	Senior Engineer	51264
Odysseas	Assistant Engineer	51413

No of rows:47265 rows

12. Show the count of employees in each department.

    ANSWER:

    select d.dept_name,count(e.first_name) from employees e inner join dept_emp de

    on e.emp_no=de.emp_no inner join departments d

    on de.dept_no=d.dept_no

    group by d.dept_name;

dept_name	count
Finance	187
Customer Service	247
Quality Management	189
Sales	542
Marketing	178
Development	820
Production	759
Research	206
Human Resources	187

    No of rows: 9 rows

13. Show the title of the employee with the first and last name whose first name is Saniya.
    ANSWER:

    select e.first_name, e.last_name, t.title from employees e

    inner join titles t on e.emp_no= t.emp_no

    where e.first_name='Saniya';

first_name	last_name	title
Saniya	Kalloufi	Assistant Engineer
Saniya	Valtorta	Technique Leader
Saniya	Herath	Senior Staff
Saniya	Herath	Staff
Saniya	Stanfel	Engineer
Saniya	Stanfel	Senior Engineer

    No of rows: 6 rows

14. List down all the female employees with their first, last, date of birth and salaries.

    ANSWER:

    select e.first_name,e.last_name,e.birth_date,s.salary

    from employees e inner join salaries s on e.emp_no=s.emp_no

    where gender='F';

first_name	last_name	birth_date	salary
Tommaso	Perelgut	1954-07-29	87222
Aimee	Petersohn	1954-05-14	57152
Gill	Stenning	1955-07-19	85103
Valeri	Vigier	1962-05-27	78929
Alejandro	Kamble	1956-05-25	99680
Dmitry	Zuberek	1961-07-24	51484
Apostol	Pintelas	1964-02-02	87174
Perla	Heyers	1952-04-15	66715
Hinrich	Siepmann	1962-02-03	74772
Lein	Validov	1957-08-28	62601
Bartek	Passino	1962-02-20	63683
Arunas	Luce	1955-12-28	67302
Mack	Schmittgen	1963-06-02	46187
Shoichi	Escriba	1958-07-16	59631
Seshu	Morton	1955-08-12	85224
Arnd	Covnot	1953-09-11	44690
Tse	Mitsuhashi	1957-04-27	67498
Dung	Driscoll	1959-05-15	58407
Kotesh	Setia	1961-03-30	84638
Rance	Provine	1956-07-02	66182

    No of rows:11480 rows

15. List down all the distinct departments.
    ANSWER:

    select dept_name from departments;

dept_name
Marketing
Finance
Human Resources
Production
Development
Quality Management
Sales
Research
Customer Service

    No of rows:6 rows

16. Find names of employees who have worked for at least three departments.

ANSWER:

```
select e.first_name from employees e inner join
dept_emp de on e.emp_no=de.emp_no
inner join departments d on de.dept_no=d.dept_no
group by e.first_name
having count(d.dept_no)>3;
```

first_name
Divine
Kankanahalli
Arco
Dinah
Zhonghui
Herbert
Shim
Remco
Ortrud
Bluma
Zhanqiu
Anneli
Amalendu
Tooru
Alain

No of rows:339 rows

17. Find all employees who were born during the 1960s.

ANSWER:

```
select first_name from employees where
birth_date BETWEEN '1960-01-01' AND '1960-12-31';
```

first_name
Patricio
Ramzi
Jeong
Huan
Yishay
Lucien
Margareta
Gao
Zhongwei
Tuval
Domenick
Armond

No of rows:207 rows

18. Show maximum salary from ‘Research’ department.

ANSWER:

```
select max(s.salary), d.dept_name from departments d
inner join dept_emp de on d.dept_no=de.dept_no
inner join salaries s on de.emp_no=s.emp_no
where dept_name = 'Research'
group by d.dept_name;
```

max	dept_name
106117	Research

1 row(s)

No of rows: 1 row

19. Find an employee who has the highest salary.

ANSWER:

```
SELECT e.first_name, s.salary FROM employees e inner join

salaries s on e.emp_no=s.emp_no where s.salary = (select max(salary) from salaries) ;
```

first_name	salary
Itzchak	145732

1 row(s)

Total runtime: 11.196 ms

No of rows:1 rows

20. Count the number of employees who has title ‘Senior engineer’ from development department

ANSWER:

```
select count(t.title), d.dept_name from departments d

inner join dept_emp de on d.dept_no=de.dept_no

inner join titles t on de.emp_no=t.emp_no

where dept_name='Development' AND t.title='Senior Engineer'

group by dept_name;
```

count	dept_name
458	Development

1 row(s)

No of rows: 1 row

5. A listing of 5 rows from each of your tables

- Departments:

  Select * from departments;

dept_no	dept_name
d001	Marketing
d002	Finance
d003	Human Resources
d004	Production
d005	Development
d006	Quality Management
d007	Sales
d008	Research
d009	Customer Service

9 row(s)

- Employee

  SELECT * FROM "Employee"."employees";

emp_no	birth_date	first_name	last_name	gender	hire_date
10001	1953-09-02	Georgi	Facello	M	1986-06-26
10002	1964-06-02	Bezalel	Simmel	F	1985-11-21
10003	1959-12-03	Parto	Bamford	M	1986-08-28
10004	1954-05-01	Chirstian	Koblick	M	1986-12-01
10005	1955-01-21	Kyoichi	Maliniak	M	1989-09-12
10006	1953-04-20	Anneke	Preusig	F	1989-06-02
10007	1957-05-23	Tzvetan	Zielinski	F	1989-02-10
10008	1958-02-19	Saniya	Kalloufi	M	1994-09-15
10009	1952-04-19	Sumant	Peac	F	1985-02-18
10010	1963-06-01	Duangkaew	Piveteau	F	1989-08-24
10011	1953-11-07	Mary	Sluis	F	1990-01-22

SELECT count(*) FROM employees;

count
3025

Total no of rows = 3025.

- Salaries

SELECT * FROM salaries;

emp_no	salary	from_date	to_date
12686	58011	1994-07-17	1995-07-17
12686	62266	1995-07-17	1996-07-16
12686	64045	1996-07-16	1997-03-06
12687	78376	1998-04-12	1999-04-12
12687	78234	1999-04-12	2000-04-11
12687	80846	2000-04-11	2001-04-11
12687	84858	2001-04-11	2002-04-11
12687	84628	2002-04-11	9999-01-01
12688	40000	1989-12-05	1990-12-05
12688	43148	1990-12-05	1991-12-05

Select count(*) from salaries;

count
28959

Total no of rows = 28,959

- Titles

Select * from titles;

emp_no	title	from_date	to_date
10001	Senior Engineer	1986-06-26	9999-01-01
10002	Staff	1996-08-03	9999-01-01
10003	Senior Engineer	1995-12-03	9999-01-01
10004	Engineer	1986-12-01	1995-12-01
10004	Senior Engineer	1995-12-01	9999-01-01
10005	Senior Staff	1996-09-12	9999-01-01
10005	Staff	1989-09-12	1996-09-12
10006	Senior Engineer	1990-08-05	9999-01-01
10007	Senior Staff	1996-02-11	9999-01-01
10007	Staff	1989-02-10	1996-02-11

Select count(*) from titles;

count
4499

No of rows = 4499.

- Dept_emp

Select * from dept_emp;

emp_no	dept_no	from_date	to_date
10001	d005	1986-06-26	9999-01-01
10002	d007	1996-08-03	9999-01-01
10003	d004	1995-12-03	9999-01-01
10004	d004	1986-12-01	9999-01-01
10005	d003	1989-09-12	9999-01-01
10006	d005	1990-08-05	9999-01-01
10007	d008	1989-02-10	9999-01-01
10008	d005	1998-03-11	2000-07-31
10009	d006	1985-02-18	9999-01-01
10010	d004	1996-11-24	2000-06-26
10010	d006	2000-06-26	9999-01-01

Select count(*) from dept_emp;

Total no of rows = 3315

count
3315

- Dept_manager

select * from dept_manager;

emp_no	dept_no	from_date	to_date
110022	d001	1985-01-01	1991-10-01
110039	d001	1991-10-01	9999-01-01
110085	d002	1985-01-01	1989-12-17
110114	d002	1989-12-17	9999-01-01
110183	d003	1985-01-01	1992-03-21
110228	d003	1992-03-21	9999-01-01
110303	d004	1985-01-01	1988-09-09
110344	d004	1988-09-09	1992-08-02
110386	d004	1992-08-02	1996-08-30
110420	d004	1996-08-30	9999-01-01
110511	d005	1985-01-01	1992-04-25
110567	d005	1992-04-25	9999-01-01
110725	d006	1985-01-01	1989-05-06
110765	d006	1989-05-06	1991-09-12
110800	d006	1991-09-12	1994-06-28
110854	d006	1994-06-28	9999-01-01

Total no of rows: 24 rows