Data Modeling:

titles

title_id	🔑	CHAR(5)
title		VARCHAR(20)

dept_manager

emp_no	🔑	int
dept_no	🔑	CHAR(4)

employees

emp_no	🔑	int
emp_title_id		CHAR(5)
birth_date		DATE
first_name		VARCHAR(16)
last_name		VARCHAR(16)
sex		enum
hire_date		DATE

departments

dept_no	🔑	CHAR(4)
dept_name	🔑	VARCHAR(50)

salaries

emp_no	🔑	int
salary		int

dept_emp

emp_no	🔑	int
dept_no	🔑	CHAR(4)

Employees Schema

```
1   departments
2   -
3   dept_no CHAR(4) PK
4   dept_name VARCHAR(50) UNIQUE
5
6   employees
7   -
8   emp_no int PK
9   emp_title_id CHAR(5) FK >- titles.title_id
10  birth_date DATE
11  first_name VARCHAR(16)
12  last_name VARCHAR(16)
13  sex enum
14  hire_date DATE
15
16  titles
17  -
18  title_id CHAR(5) PK
19  title VARCHAR(20)
20
21  salaries
22  -
23  emp_no int PK FK >- employees.emp_no
24  salary int
25
26  dept_emp
27  -
28  emp_no int PK FK >- employees.emp_no
29  dept_no CHAR(4) PK FK >- departments.dept_no
30
31  dept_manager
32  -
33  emp_no int PK FK >- employees.emp_no
34  dept_no CHAR(4) PK FK >- departments.dept_no
```

No errors found. Good job!

titles

title_id	🔑	CHAR(5)
title		VARCHAR(20)

dept_manager

emp_no	🔑	int
dept_no	🔑	CHAR(4)

employees

emp_no	🔑	int
emp_title_id		CHAR(5)
birth_date		DATE
first_name		VARCHAR(16)
last_name		VARCHAR(16)
sex		enum
hire_date		DATE

departments

dept_no	🔑	CHAR(4)
dept_name	🔑	VARCHAR(50)

salaries

emp_no	🔑	int
salary		int

dept_emp

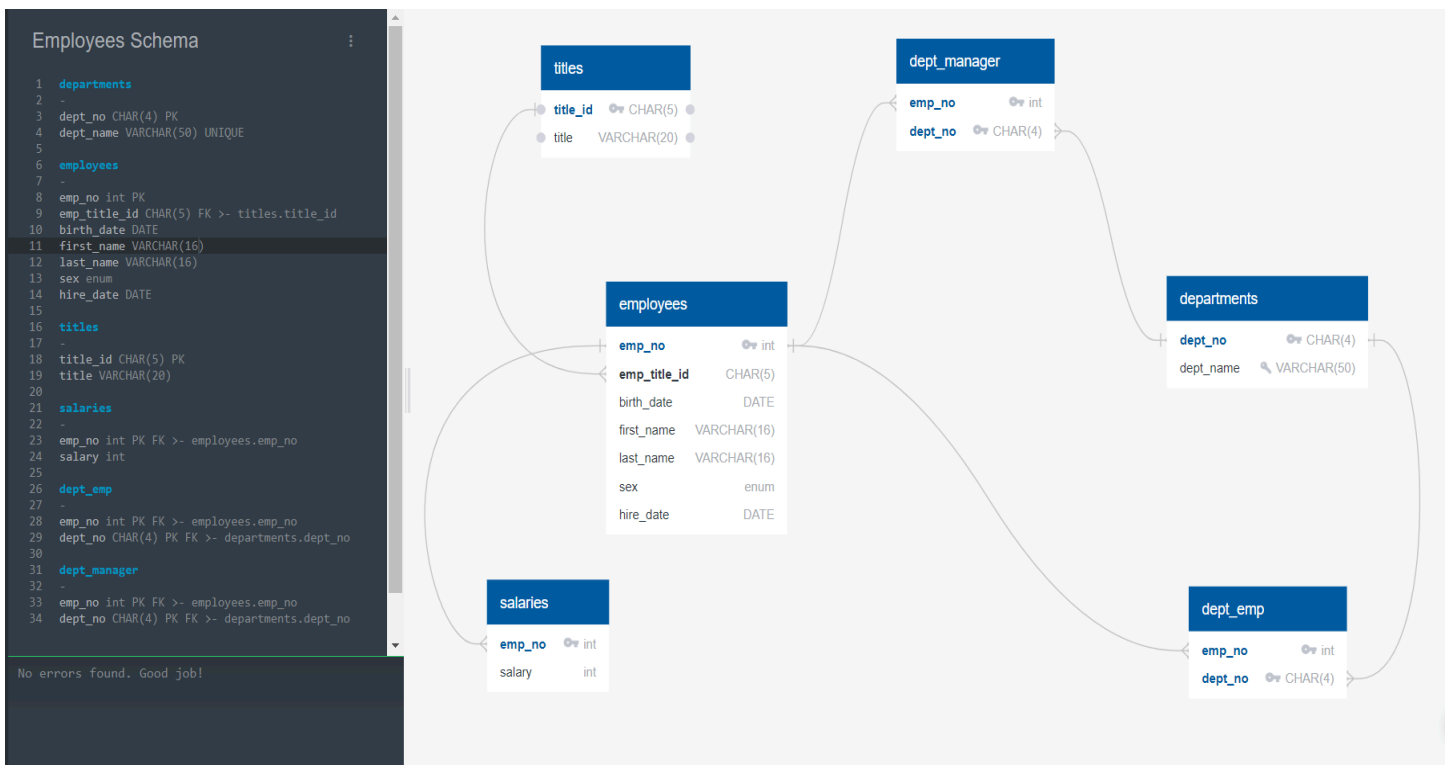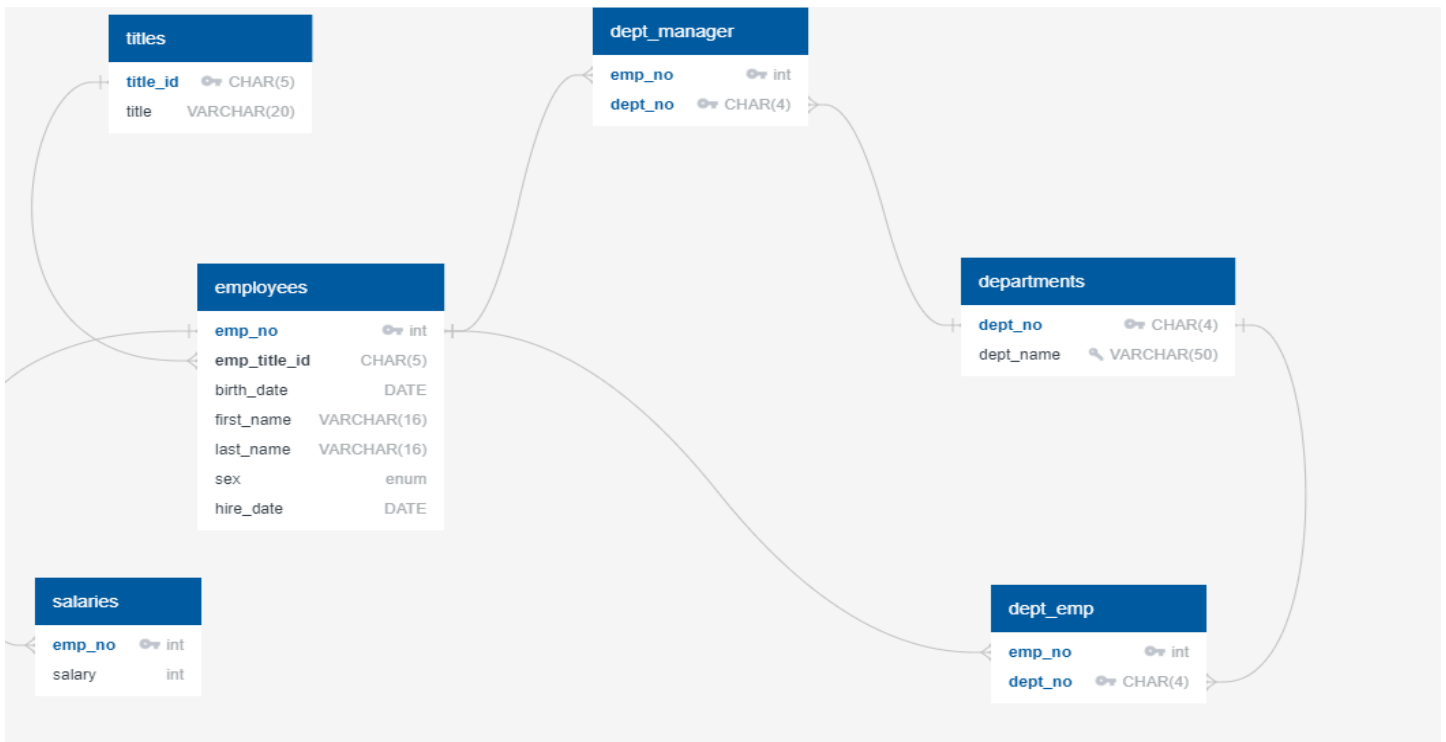|		
emp_no	🔑	int
dept_no	🔑	CHAR(4)

Data Engineering:

```sql
CREATE DATABASE employee_data;

USE employee_data;

CREATE TABLE departments(
    dept_no CHAR(4) PRIMARY KEY NOT NULL,
    dept_name VARCHAR(50) UNIQUE NOT NULL
);

CREATE TABLE titles (
    title_id CHAR(5) PRIMARY KEY NOT NULL,
    title VARCHAR(20)
);
CREATE TABLE employees (
    emp_no INT PRIMARY KEY NOT NULL,
    emp_title_id CHAR(5) NOT NULL,
    birth_date DATE,
    first_name VARCHAR(16),
    last_name VARCHAR(16),
    sex CHAR(1)
    hire_date DATE,
    FOREIGN KEY (emp_title_id) REFERENCES titles(title_id));

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

CREATE TABLE dept_emp (
    emp_no INT NOT NULL,
    dept_no CHAR(4) NOT NULL,
    PRIMARY KEY (emp_no, dept_no),
    FOREIGN KEY (emp_no) REFERENCES employees(emp_no),
    FOREIGN KEY (dept_no) REFERENCES departments(dept_no) );


CREATE TABLE dept_manager (
    emp_no INT NOT NULL,
```

```
    dept_no CHAR(4) NOT NULL,
    PRIMARY KEY (emp_no, dept_no),
    FOREIGN KEY (emp_no) REFERENCES employees(emp_no),
    FOREIGN KEY (dept_no) REFERENCES departments(dept_no) );
```

Data Analysis:

- List the employee number, last name, first name, sex, and salary of each employee

```sql
SELECT e.emp_no, e.last_name, e.first_name, e.sex, s.salary
FROM employees e
JOIN salaries s
ON e.emp_no = s.emp_no;
```

100 %

▦ Results | 📊 Messages

	emp_no	last_name	first_name	sex	salary
1	10002	Simmel	Bezalel	F	65828
2	10003	Bamford	Parto	M	40006
3	10005	Maliniak	Kyoichi	M	78228
4	10008	Kalloufi	Saniya	M	46671
5	10014	Genin	Berni	M	46168
6	10015	Nooteboom	Guoxiang	M	40000
7	10016	Cappelletti	Kazuhito	M	70889
8	10017	Bouloucos	Cristinel	F	71380
9	10018	Peha	Kazuhide	F	55881
10	10019	Haddadi	Lillian	M	44276
11	10022	Famili	Shahaf	M	40000
12	10023	Montemayor	Bojan	F	47883
13	10027	Reistad	Divier	F	40000
14	10030	Demeyer	Elvis	M	66956
15	10031	Joslin	Karsten	M	40000
16	10033	Merlo	Arif	M	51258
17	10035	Chappelet	Alain	M	41538
18	10038	Lortz	Huan	M	40000
19	10040	Meriste	Weiyi	F	52153
20	10041	Lenart	Uri	F	56893
21	10043	Tzvieli	Yishay	M	49324
22	10044	Casley	Mingsen	F	40919
23	10045	Shanbhog...	Moss	M	41971
24	10048	Syrotiuk	Florian	M	40000
25	10051	Caine	Hidefumi	M	48817
26	10053	Zschoche	Sanjiv	F	67854
27	10056	Bernini	Brendon	F	48857
28	10057	Callaway	Ebbe	F	49616
29	10058	McFarlin	Berhard	M	52787
30	10061	Herber	Tse	M	68577
31	10062	Peyn	Anoosh	M	55685

✔ Query executed successfully.

- List the first name, last name, and hire date for the employees who were hired in 1986

```sql
SELECT first_name, last_name, hire_date
FROM employees
WHERE YEAR(hire_date) = 1986;
```

⊞ Results ▤ Messages

	first_name	last_name	hire_date
1	Parto	Bamford	1986-08-28
2	Sanjiv	Zschoche	1986-02-04
3	Kwee	Schusler	1986-02-26
4	Kshitij	Gils	1986-03-27
5	Zhongwei	Rosen	1986-10-30
6	Kendra	Hofting	1986-03-14
7	Lunjin	Giveon	1986-10-02
8	Chikara	Rissland	1986-01-23
9	Domenick	Peltason	1986-03-14
10	Kazuhito	Encarnacion	1986-08-21
11	Jaques	Munro	1986-01-27
12	Khedija	Mitsuhashi	1986-01-29
13	Kasturi	Jenevein	1986-01-02
14	Valery	Litvinov	1986-10-07
15	Duro	Sidhu	1986-03-01
16	Idoia	Kavraki	1986-11-22
17	Nevio	Ritcey	1986-12-04
18	Yongmin	Roison	1986-05-12
19	Tze	Nourani	1986-06-08
20	Kellie	Chinen	1986-06-19
21	Nishit	Siochi	1986-12-17
22	Sham	Eastman	1986-05-23
23	Hercules	Benzmuller	1986-06-04
24	Narain	Oaver	1986-05-28
25	Arie	Birge	1986-12-10
26	Remko	Shigei	1986-01-20
27	Seshu	Sidou	1986-10-23
28	Feiyu	Luft	1986-01-16
29	Masoud	Fabrizio	1986-05-06
30	Martien	Improta	1986-03-09
31	Marsha	Tagansky	1986-12-19
32	Yonghoan	Alencar	1986-03-22
33	Marke	Cesareni	1986-12-12

✅ Query executed successfully.

- List the manager of each department along with their department number, department name, employee number, last name, and first name

```
SELECT dptm.dept_no, d.dept_name, dptm.emp_no, e.last_name, e.first_name
FROM dept_manager dptm
JOIN departments d
 ON dptm.dept_no = d.dept_no
JOIN employees e
 ON dptm.emp_no = e.emp_no;
```

100 %

⊞ Results 🗐 Messages

	dept_no	dept_name	emp_no	last_name	first_name
1	d001	Marketing	110022	Markovitch	Margareta
2	d001	Marketing	110039	Minakawa	Vishwani
3	d002	Finance	110114	Legleitner	Isamu
4	d003	Human Resources	110183	Ossenbruggen	Shirish
5	d003	Human Resources	110228	Sigstam	Karsten
6	d004	Production	110420	Ghazalie	Oscar
7	d005	Development	110511	Hagimont	DeForest
8	d005	Development	110567	DasSarma	Leon
9	d006	Quality Management	110725	Onuegbe	Peternela
10	d006	Quality Management	110765	Hofmeyr	Rutger
11	d006	Quality Management	110800	Quadeer	Sanjoy
12	d006	Quality Management	110854	Pesch	Dung
13	d007	Sales	111035	Kaelbling	Przemyslawa
14	d008	Research	111534	Kambil	Hilary
15	d009	Customer Service	111877	Spinelli	Xiaobin
16	d009	Customer Service	111939	Weedman	Yuchang

✔ Query executed successfully.

- List the department number for each employee along with that employee's employee number, last name, first name, and department name

```sql
SELECT dept.dept_no, dept.emp_no, e.last_name, e.first_name,d.dept_name
FROM dept_emp dept
JOIN departments d
  ON dept.dept_no = d.dept_no
JOIN employees e
  ON dept.emp_no = e.emp_no;
```

▦ Results 🗟 Messages

	dept_no	emp_no	last_name	first_name	dept_name
1	d007	10002	Simmel	Bezalel	Sales
2	d004	10003	Bamford	Parto	Production
3	d003	10005	Maliniak	Kyoichi	Human Resources
4	d005	10008	Kalloufi	Saniya	Development
5	d005	10014	Genin	Berni	Development
6	d008	10015	Nooteboom	Guoxiang	Research
7	d007	10016	Cappelletti	Kazuhito	Sales
8	d001	10017	Bouloucos	Cristinel	Marketing
9	d004	10018	Peha	Kazuhide	Production
10	d005	10018	Peha	Kazuhide	Development
11	d008	10019	Haddadi	Lillian	Research
12	d005	10022	Famili	Shahaf	Development
13	d005	10023	Montemayor	Bojan	Development
14	d005	10027	Reistad	Divier	Development
15	d004	10030	Demeyer	Elvis	Production
16	d005	10031	Joslin	Karsten	Development
17	d006	10033	Merlo	Arif	Quality Management
18	d004	10035	Chappelet	Alain	Production
19	d009	10038	Lortz	Huan	Customer Service
20	d005	10040	Meriste	Weiyi	Development
21	d008	10040	Meriste	Weiyi	Research
22	d007	10041	Lenart	Uri	Sales
23	d005	10043	Tzvieli	Yishay	Development
24	d004	10044	Casley	Mingsen	Production
25	d004	10045	Shanbhogue	Moss	Production
26	d005	10048	Syrotiuk	Florian	Development
27	d004	10051	Caine	Hidefumi	Production
28	d007	10053	Zschoche	Sanjiv	Sales
29	d005	10056	Bernini	Brendon	Development
30	d005	10057	Callaway	Ebbe	Development
31	d001	10058	McFarlin	Berhard	Marketing
32	d007	10061	Herber	Tse	Sales

✅ Query executed successfully.

- List first name, last name, and sex of each employee whose first name is Hercules and whose last name begins with the letter B

```
SELECT first_name, last_name, sex
FROM employees
WHERE first_name = 'Hercules'
 AND last_name LIKE 'B%';
```

▦ Results ▣ Messages

	first_name	last_name	sex
1	Hercules	Benzmuller	M
2	Hercules	Baranowski	M
3	Hercules	Baer	M
4	Hercules	Bernardinello	F
5	Hercules	Basagni	M
6	Hercules	Bernatsky	M
7	Hercules	Bail	F
8	Hercules	Birge	F
9	Hercules	Bisiani	F
10	Hercules	Bodoff	M
11	Hercules	Biron	F
12	Hercules	Benantar	F
13	Hercules	Berstel	F

✔ Query executed successfully.

- List each employee in the Sales department, including their employee number, last name, and first name

```
SELECT e.emp_no, e.last_name, e.first_name
FROM employees e
JOIN dept_emp de
ON e.emp_no = de.emp_no
JOIN departments d
ON de.dept_no = d.dept_no WHERE d.dept_name = 'Sales';
```

- List each employee in the Sales and Development departments, including their employee number, last name, first name, and department name

```sql
SELECT e.emp_no, e.last_name, e.first_name, d.dept_name
FROM employees e
JOIN dept_emp de
  ON e.emp_no = de.emp_no
JOIN departments d
  ON de.dept_no = d.dept_no
WHERE d.dept_name IN ('Sales', 'Development');
```

	emp_no	last_name	first_name	dept_name
1	10002	Simmel	Bezalel	Sales
2	10008	Kalloufi	Saniya	Development
3	10014	Genin	Berni	Development
4	10016	Cappelletti	Kazuhito	Sales
5	10018	Peha	Kazuhide	Development
6	10022	Famili	Shahaf	Development
7	10023	Montemayor	Bojan	Development
8	10027	Reistad	Divier	Development
9	10031	Joslin	Karsten	Development
10	10040	Meriste	Weiyi	Development
11	10041	Lenart	Uri	Sales
12	10043	Tzvieli	Yishay	Development
13	10048	Syrotiuk	Florian	Development
14	10053	Zschoche	Sanjiv	Sales
15	10056	Bernini	Brendon	Development
16	10057	Callaway	Ebbe	Development
17	10061	Herber	Tse	Sales
18	10062	Peyn	Anoosh	Development
19	10065	Awdeh	Satosi	Development
20	10066	Schusler	Kwee	Development
21	10072	Sidou	Hironoby	Development
22	10074	Bernatsky	Mokhtar	Development
23	10075	Dolinsky	Gao	Development
24	10078	Mondadori	Danel	Development
25	10079	Gils	Kshitij	Development
26	10088	Syrzycki	Jungsoon	Sales
27	10090	Hofting	Kendra	Development
28	10091	Gomatam	Amabile	Development
29	10099	Sullins	Valter	Sales
30	10101	Hevers	Perla	Sales

- List the frequency counts, in descending order, of all the employee last names (that is, how many employees share each last name)

```
SELECT last_name, COUNT(*) AS frequency
FROM employees
GROUP BY last_name
ORDER BY frequency DESC;
```

	last_name	frequency
1	Wendorf	142
2	Masada	137
3	Ohori	135
4	Stifter	134
5	Rabehasaina	134
6	Farris	134
7	Linares	134
8	Mahnke	133
9	Serra	131
10	Coors	131
11	Kitsuregawa	131
12	Braunmuhl	131
13	Domenig	131
14	Langford	131
15	Boudaillier	131
16	Rajcani	131
17	Adachi	131
18	Swick	130
19	Hiroyama	130
20	Asser	130
21	Solares	129
22	Kornyak	129
23	Perng	129
24	DeMori	129
25	Scallan	129
26	Schaaf	129
27	Rajaraman	128
28	Gaughan	128
29	Boguraev	128
30	Emmart	128
31	Swen	128
32	Malabarba	128
33	Fontan	128
34	Barriga	127
35	Siepmann	127

⊘ Query executed successfully.