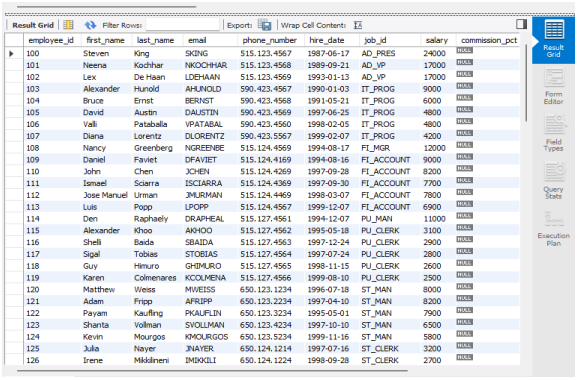
Devesh Kumar Gola
2023399094

SQL Project

Fundamentals of Structured Query Language - 1

1. Retrieve all details of employees.

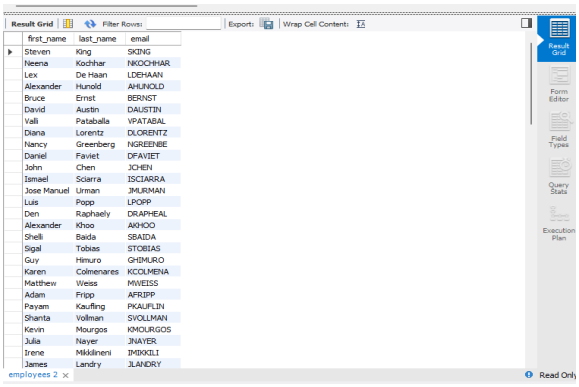
```
SELECT * FROM employees;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	24000	NULL
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL
105	David	Austin	DAUSTIN	590.423.4569	1997-06-25	IT_PROG	4800	NULL
106	Valli	Pataballa	VPATABAL	590.423.4560	1998-02-05	IT_PROG	4800	NULL
107	Diana	Lorentz	DLORENTZ	590.423.5567	1999-02-07	IT_PROG	4200	NULL
108	Nancy	Greenberg	NGREENBE	515.124.4569	1994-08-17	FI_MGR	12000	NULL
109	Daniel	Faviet	DFAVIET	515.124.4169	1994-08-16	FI_ACCOUNT	9000	NULL
110	John	Chen	JCHEN	515.124.4269	1997-09-28	FI_ACCOUNT	8200	NULL
111	Ismael	Sciarra	ISCIARRA	515.124.4369	1997-09-30	FI_ACCOUNT	7700	NULL
112	Jose Manuel	Urman	JMURMAN	515.124.4469	1998-03-07	FI_ACCOUNT	7800	NULL
113	Luis	Popp	LPOPP	515.124.4567	1999-12-07	FI_ACCOUNT	6900	NULL
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL
115	Alexander	Khoo	AKHOO	515.127.4562	1995-05-18	PU_CLERK	3100	NULL
116	Shelli	Baida	SBAIDA	515.127.4563	1997-12-24	PU_CLERK	2900	NULL
117	Sigal	Tobias	STOBIAS	515.127.4564	1997-07-24	PU_CLERK	2800	NULL
118	Guy	Himuro	GHIMURO	515.127.4565	1998-11-15	PU_CLERK	2600	NULL
119	Karen	Colmenares	KCOLMENA	515.127.4566	1999-08-10	PU_CLERK	2500	NULL
120	Matthew	Weiss	MWEISS	650.123.1234	1996-07-18	ST_MAN	8000	NULL
121	Adam	Fripp	AFRIPP	650.123.2234	1997-04-10	ST_MAN	8200	NULL
122	Payam	Kaufling	PKAUFLIN	650.123.3234	1995-05-01	ST_MAN	7900	NULL
123	Shanta	Vollman	SVOLLMAN	650.123.4234	1997-10-10	ST_MAN	6500	NULL
124	Kevin	Mourgos	KMOURGOS	650.123.5234	1999-11-16	ST_MAN	5800	NULL
125	Julia	Nayer	JNAYER	650.124.1214	1997-07-16	ST_CLERK	3200	NULL
126	Irene	Mikkilineni	IMIKKILI	650.124.1224	1998-09-28	ST_CLERK	2700	NULL

2. Display the first name, last name, and email of all employees.

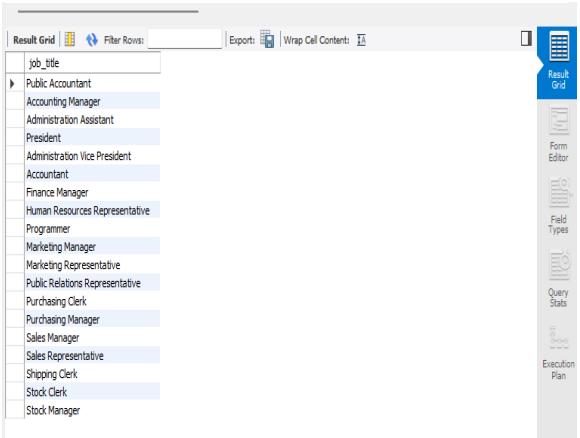
```
SELECT first_name, last_name, email FROM employees;
```



first_name	last_name	email
Steven	King	SKING
Neena	Kochhar	NKOCHHAR
Lex	De Haan	LDEHAAN
Alexander	Hunold	AHUNOLD
Bruce	Ernst	BERNST
David	Austin	DAUSTIN
Valli	Pataballa	VPATABAL
Diana	Lorentz	DLORENTZ
Nancy	Greenberg	NGREENBE
Daniel	Faviet	DFAVIET
John	Chen	JCHEN
Ismael	Sciarra	ISCIARRA
Jose Manuel	Urman	JMURMAN
Luis	Popp	LPOPP
Den	Raphaely	DRAPHEAL
Alexander	Khoo	AKHOO
Shelli	Baida	SBAIDA
Sigal	Tobias	STOBIAS
Guy	Himuro	GHIMURO
Karen	Colmenares	KCOLMENA
Matthew	Weiss	MWEISS
Adam	Fripp	AFRIPP
Payam	Kaufling	PKAUFLIN
Shanta	Vollman	SVOLLMAN
Kevin	Mourgos	KMOURGOS
Julia	Nayer	JNAYER
Irene	Mikkilineni	IMIKKILI
James	Landry	JLANDRY

3. Retrieve the distinct job titles from the jobs table.

```
SELECT DISTINCT job_title FROM jobs;
```



job_title
Public Accountant
Accounting Manager
Administration Assistant
President
Administration Vice President
Accountant
Finance Manager
Human Resources Representative
Programmer
Marketing Manager
Marketing Representative
Public Relations Representative
Purchasing Clerk
Purchasing Manager
Sales Manager
Sales Representative
Shipping Clerk
Stock Clerk
Stock Manager

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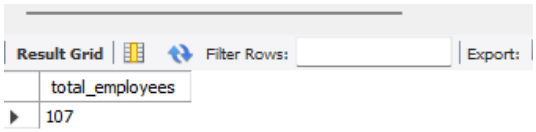
4. Find the total number of employees in the company.

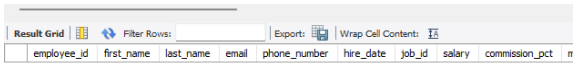
```
SELECT COUNT(*) AS total_employees FROM employees;
```



total_employees
107

5. Retrieve the employees who were hired after January 1, 2015.

```
SELECT * FROM employees WHERE hire_date > '2015-01-01';
```

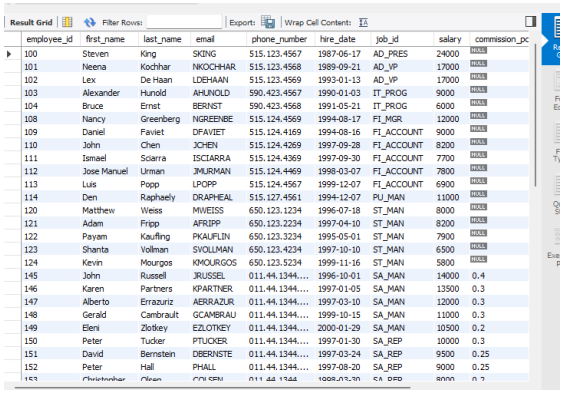


employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct

Fundamentals of Structured Query Language - 2

6. List all employees who have a salary greater than 5000.

```
SELECT * FROM employees WHERE salary > 5000;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	24000	NULL
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL
108	Nancy	Greenberg	NGREENBE	515.124.4569	1994-08-17	FI_MGR	12000	NULL
109	Daniel	Faviet	DFAVIET	515.124.4169	1994-08-16	FI_ACCOUNT	9000	NULL
110	John	Chen	JCHEN	515.124.4269	1997-09-28	FI_ACCOUNT	8200	NULL
111	Ismael	Sciarra	ISCIARRA	515.124.4369	1997-09-30	FI_ACCOUNT	7700	NULL
112	Jose Manuel	Urman	JMURMAN	515.124.4469	1998-03-07	FI_ACCOUNT	7800	NULL
113	Luis	Popp	LPOPP	515.124.4567	1999-12-07	FI_ACCOUNT	6900	NULL
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL
120	Matthew	Weiss	MWEISS	650.123.1234	1996-07-18	ST_MAN	8000	NULL
121	Adam	Fripp	AFRIPP	650.123.2234	1997-04-10	ST_MAN	8200	NULL
122	Payam	Kaufling	PKAUFLIN	650.123.3234	1995-05-01	ST_MAN	7900	NULL
123	Shanta	Vollman	SVOLLMAN	650.123.4234	1997-10-10	ST_MAN	6500	NULL
124	Kevin	Mourgos	KMOURGOS	650.123.5234	1999-11-16	ST_MAN	5800	NULL
145	John	Russell	JRUSSEL	011.44.1344....	1996-10-01	SA_MAN	14000	0.4
146	Karen	Partners	KPARTNER	011.44.1344....	1997-01-05	SA_MAN	13500	0.3
147	Alberto	Errazuriz	AERRAZUR	011.44.1344....	1997-03-10	SA_MAN	12000	0.3
148	Gerald	Cambrault	GCAMBRAU	011.44.1344....	1999-10-15	SA_MAN	11000	0.3
149	Eleni	Zlotkey	EZLOTKEY	011.44.1344....	2000-01-29	SA_MAN	10500	0.2
150	Peter	Tucker	PTUCKER	011.44.1344....	1997-01-30	SA_REP	10000	0.3
151	David	Bernstein	DBERNSTE	011.44.1344....	1997-03-24	SA_REP	9500	0.25
152	Peter	Hall	PHALL	011.44.1344....	1997-08-20	SA_REP	9000	0.25

7. Retrieve employees with job titles containing the word ‘Manager.’

```
SELECT * FROM employees e
JOIN jobs j ON e.job_id = j.job_id
WHERE j.job_title LIKE '%Manager%';
```

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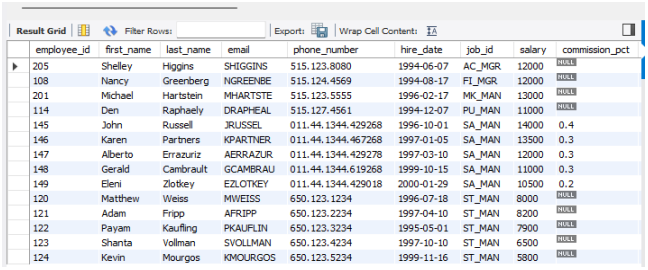
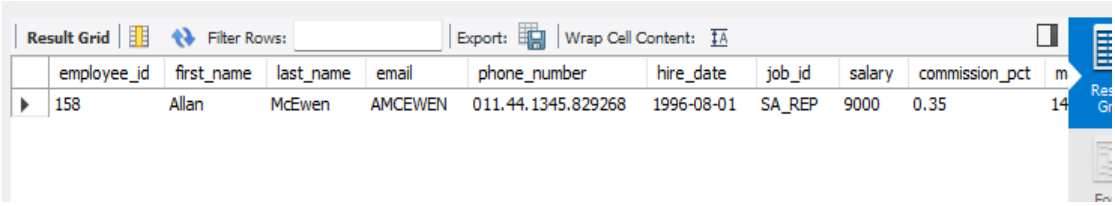


employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct
205	Shelley	Higgins	SHIGGINS	515.123.8080	1994-06-07	AC_MGR	12000	NULL
108	Nancy	Greenberg	NGREENBE	515.124.4569	1994-08-17	FI_MGR	12000	NULL
201	Michael	Hartstein	MHARTSTE	515.123.5555	1996-02-17	MK_MAN	13000	NULL
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL
145	John	Russell	JRUSSEL	011.44.1344.429268	1996-10-01	SA_MAN	14000	0.4
146	Karen	Partners	KPARTNER	011.44.1344.467268	1997-01-05	SA_MAN	13500	0.3
147	Alberto	Errazuriz	AERRAZUR	011.44.1344.429278	1997-03-10	SA_MAN	12000	0.3
148	Gerald	Cambrault	GCAMBRAU	011.44.1344.619268	1999-10-15	SA_MAN	11000	0.3
149	Eleni	Zlotkey	EZLOTKEY	011.44.1344.429018	2000-01-29	SA_MAN	10500	0.2
120	Matthew	Weiss	MWEISS	650.123.1234	1996-07-18	ST_MAN	8000	NULL
121	Adam	Fripp	AFRIPP	650.123.2234	1997-04-10	ST_MAN	8200	NULL
122	Payam	Kaufling	PKAUFLIN	650.123.3234	1995-05-01	ST_MAN	7900	NULL
123	Shanta	Vollman	SVOLLMAN	650.123.4234	1997-10-10	ST_MAN	6500	NULL
124	Kevin	Mourgos	KMOURGOS	650.123.5234	1999-11-16	ST_MAN	5800	NULL

8. Retrieve all employees whose first name starts with ‘A’ and ends with ‘n.’

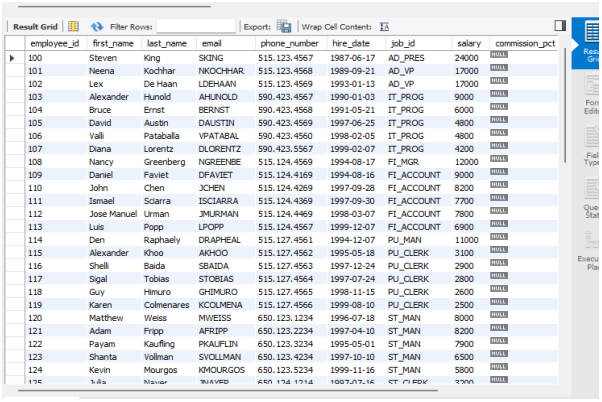
```
SELECT * FROM employees WHERE first_name LIKE 'A%n';
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	m
158	Allan	McEwen	AMCEWEN	011.44.1345.829268	1996-08-01	SA_REP	9000	0.35	14

9. Display the employees who do not have a commission.

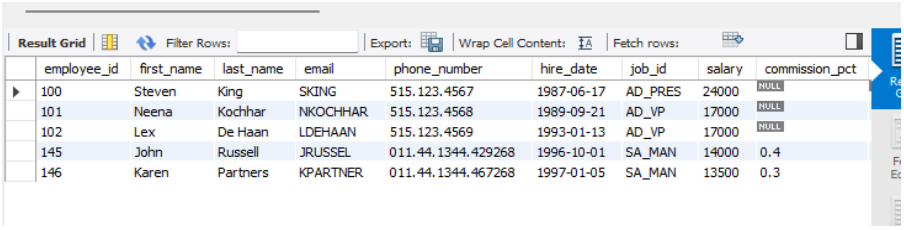
```
SELECT * FROM employees WHERE commission_pct IS NULL OR commission_pct = 0;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	24000	NULL
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL
103	Alexander	Hunold	AHUNOLD	590.423.4567	1990-01-03	IT_PROG	9000	NULL
104	Bruce	Ernst	BERNST	590.423.4568	1991-05-21	IT_PROG	6000	NULL
105	David	Austin	DAUSTIN	590.423.4569	1997-06-25	IT_PROG	4800	NULL
106	Valli	Pataballa	VPATABAL	590.423.4560	1998-02-05	IT_PROG	4800	NULL
107	Diana	Lorentz	DLORENTZ	590.423.5567	1999-02-07	IT_PROG	4200	NULL
108	Nancy	Greenberg	NGREENBE	515.124.4569	1994-08-17	FI_MGR	12000	NULL
109	Daniel	Faviet	DFAVIET	515.124.4169	1994-08-16	FI_ACCOUNT	9000	NULL
110	John	Chen	JCHEN	515.124.4269	1997-09-28	FI_ACCOUNT	8200	NULL
111	Ismael	Sciarra	ISCIARRA	515.124.4369	1997-09-30	FI_ACCOUNT	7700	NULL
112	Jose Manuel	Urman	JMURMAN	515.124.4469	1998-03-07	FI_ACCOUNT	7800	NULL
113	Luis	Popp	LPOPP	515.124.4567	1999-12-07	FI_ACCOUNT	6900	NULL
114	Den	Raphaely	DRAPHEAL	515.127.4561	1994-12-07	PU_MAN	11000	NULL
115	Alexander	Khoo	AKHOO	515.127.4562	1995-05-18	PU_CLERK	3100	NULL
116	Shelli	Baida	SBAIDA	515.127.4563	1997-12-24	PU_CLERK	2900	NULL
117	Sigal	Tobias	STOBIAS	515.127.4564	1997-07-24	PU_CLERK	2800	NULL
118	Guy	Himuro	GHIMURO	515.127.4565	1998-11-15	PU_CLERK	2600	NULL
119	Karen	Colmenares	KCOLMENA	515.127.4566	1999-08-10	PU_CLERK	2500	NULL
120	Matthew	Weiss	MWEISS	650.123.1234	1996-07-18	ST_MAN	8000	NULL
121	Adam	Fripp	AFRIPP	650.123.2234	1997-04-10	ST_MAN	8200	NULL
122	Payam	Kaufling	PKAUFLIN	650.123.3234	1995-05-01	ST_MAN	7900	NULL
123	Shanta	Vollman	SVOLLMAN	650.123.4234	1997-10-10	ST_MAN	6500	NULL
124	Kevin	Mourgos	KMOURGOS	650.123.5234	1999-11-16	ST_MAN	5800	NULL

10. Retrieve the top 5 highest-paid employees.

```
SELECT * FROM employees ORDER BY salary DESC LIMIT 5;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct
100	Steven	King	SKING	515.123.4567	1987-06-17	AD_PRES	24000	NULL
101	Neena	Kochhar	NKOCHHAR	515.123.4568	1989-09-21	AD_VP	17000	NULL
102	Lex	De Haan	LDEHAAN	515.123.4569	1993-01-13	AD_VP	17000	NULL
145	John	Russell	JRUSSEL	011.44.1344.429268	1996-10-01	SA_MAN	14000	0.4
146	Karen	Partners	KPARTNER	011.44.1344.467268	1997-01-05	SA_MAN	13500	0.3

SQL Functions

11. Find the average salary of all employees.

```
SELECT AVG(salary) AS avg_salary FROM employees;
```

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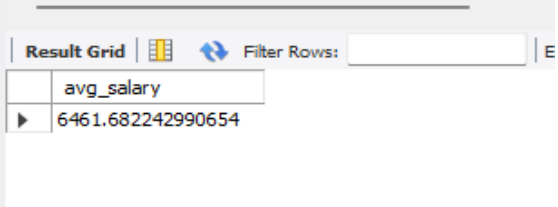
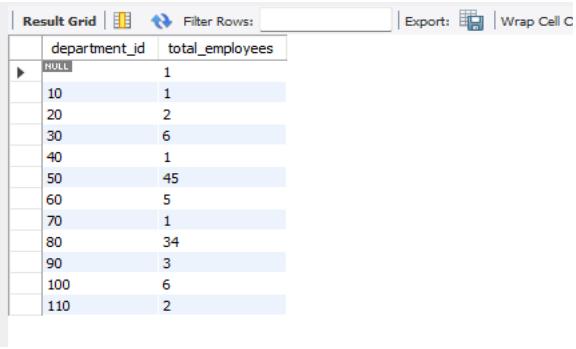


Result Grid | Filter Rows:

avg_salary
6461.682242990654

12. Retrieve the total number of employees working in each department.

SELECT department_id, COUNT(*) AS total_employees FROM employees GROUP BY department_id;

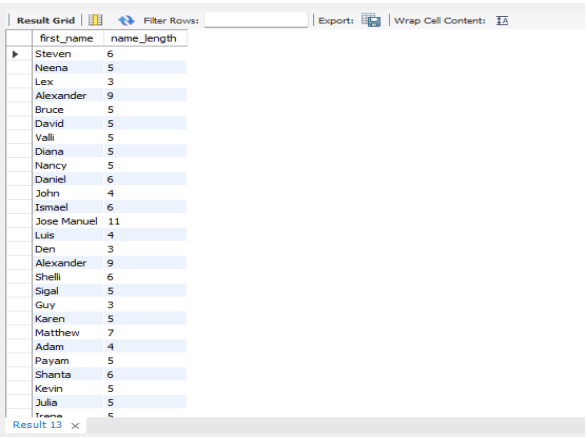


Result Grid | Filter Rows: | Export: | Wrap Cell C

department_id	total_employees
NULL	1
10	1
20	2
30	6
40	1
50	45
60	5
70	1
80	34
90	3
100	6
110	2

13. Display the employee's first name and the length of their first name.

SELECT first_name, LENGTH(first_name) AS name_length FROM employees;



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

first_name	name_length
Steven	6
Neena	5
Lex	3
Alexander	9
Bruce	5
David	5
Valli	5
Diana	5
Nancy	5
Daniel	6
John	4
Ismael	6
Jose Manuel	11
Luis	4
Den	3
Alexander	9
Shelli	6
Sigal	5
Guy	3
Karen	5
Matthew	7
Adam	4
Payam	5
Shanta	6
Kevin	5
Julia	5

Result 13

14. Convert the hire_date of employees to display only the year.

SELECT first_name, last_name, YEAR(hire_date) AS hire_year FROM employees;

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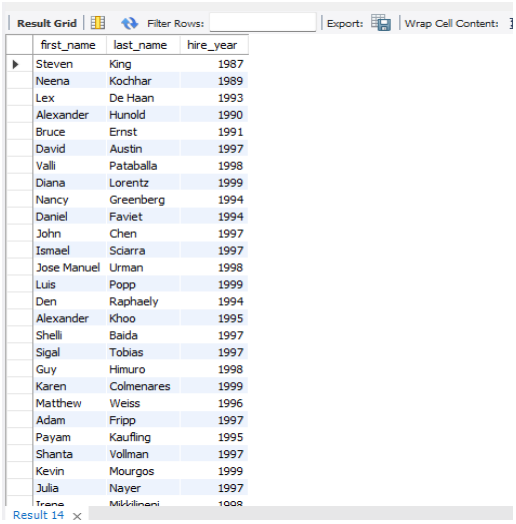
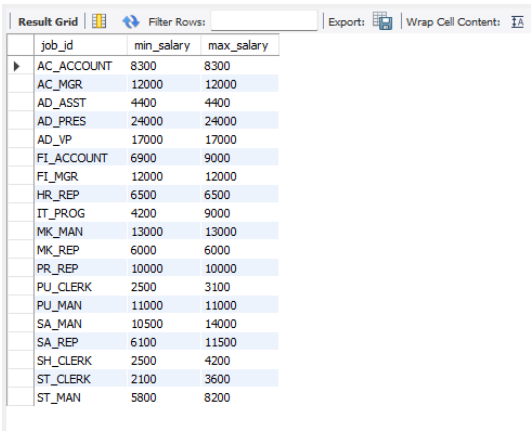


first_name	last_name	hire_year
Steven	King	1987
Neena	Kochhar	1989
Lex	De Haan	1993
Alexander	Hunold	1990
Bruce	Ernst	1991
David	Austin	1997
Valli	Pataballa	1998
Diana	Lorentz	1999
Nancy	Greenberg	1994
Daniel	Faviet	1994
John	Chen	1997
Ismael	Sciarra	1997
Jose Manuel	Urman	1998
Luis	Popp	1999
Den	Raphaely	1994
Alexander	Khoo	1995
Shelli	Baida	1997
Sigal	Tobias	1997
Guy	Himuro	1998
Karen	Colmenares	1999
Matthew	Weiss	1996
Adam	Fripp	1997
Payam	Kaufling	1995
Shanta	Vollman	1997
Kevin	Mourgos	1999
Julia	Nayer	1997

15. Retrieve the minimum and maximum salary for each job title.

SELECT job_id, MIN(salary) AS min_salary, MAX(salary) AS max_salary FROM employees GROUP BY job_id;



job_id	min_salary	max_salary
AC_ACCOUNT	8300	8300
AC_MGR	12000	12000
AD_ASST	4400	4400
AD_PRES	24000	24000
AD_VP	17000	17000
FI_ACCOUNT	6900	9000
FI_MGR	12000	12000
HR_REP	6500	6500
IT_PROG	4200	9000
MK_MAN	13000	13000
MK_REP	6000	6000
PR_REP	10000	10000
PU_CLERK	2500	3100
PU_MAN	11000	11000
SA_MAN	10500	14000
SA_REP	6100	11500
SH_CLERK	2500	4200
ST_CLERK	2100	3600
ST_MAN	5800	8200

SQL Tables, Joins

16. Retrieve the employee names along with their department names.

SELECT e.first_name, e.last_name, d.department_name

FROM employees e

JOIN departments d ON e.department_id = d.department_id;

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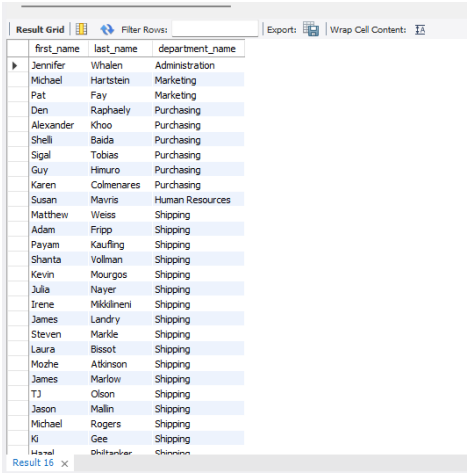
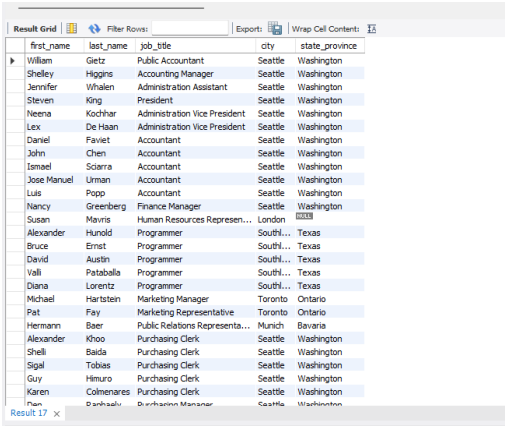


first_name	last_name	department_name
Jennifer	Whalen	Administration
Michael	Hartstein	Marketing
Pat	Fay	Marketing
Den	Raphaely	Purchasing
Alexander	Khoo	Purchasing
Shelli	Baida	Purchasing
Sigal	Tobias	Purchasing
Guy	Himuro	Purchasing
Karen	Colmenares	Purchasing
Susan	Mavris	Human Resources
Matthew	Weiss	Shipping
Adam	Fripp	Shipping
Payam	Kaufling	Shipping
Shanta	Vollman	Shipping
Kevin	Mourgos	Shipping
Julia	Nayer	Shipping
Irene	Mikkilineni	Shipping
James	Landry	Shipping
Steven	Markle	Shipping
Laura	Bissot	Shipping
Mozhe	Atkinson	Shipping
James	Marlow	Shipping
TJ	Olson	Shipping
Jason	Mallin	Shipping
Michael	Rogers	Shipping
Ki	Gee	Shipping

17. List the employees along with their job titles and the location of their department.

```
SELECT e.first_name, e.last_name, j.job_title, l.city, l.state_province
FROM employees e
JOIN jobs j ON e.job_id = j.job_id
JOIN departments d ON e.department_id = d.department_id
JOIN locations l ON d.location_id = l.location_id;
```



first_name	last_name	job_title	city	state_province
William	Gietz	Public Accountant	Seattle	Washington
Shelley	Higgins	Accounting Manager	Seattle	Washington
Jennifer	Whalen	Administration Assistant	Seattle	Washington
Steven	King	President	Seattle	Washington
Neena	Kochhar	Administration Vice President	Seattle	Washington
Lex	De Haan	Administration Vice President	Seattle	Washington
Daniel	Faviet	Accountant	Seattle	Washington
John	Chen	Accountant	Seattle	Washington
Ismael	Sciarra	Accountant	Seattle	Washington
Jose Manuel	Urman	Accountant	Seattle	Washington
Luis	Popp	Accountant	Seattle	Washington
Nancy	Greenberg	Finance Manager	Seattle	Washington
Susan	Mavris	Human Resources Represen...	London	
Alexander	Hunold	Programmer	Southl...	Texas
Bruce	Ernst	Programmer	Southl...	Texas
David	Austin	Programmer	Southl...	Texas
Valli	Pataballa	Programmer	Southl...	Texas
Diana	Lorentz	Programmer	Southl...	Texas
Michael	Hartstein	Marketing Manager	Toronto	Ontario
Pat	Fay	Marketing Representative	Toronto	Ontario
Hermann	Baer	Public Relations Representa...	Munich	Bavaria
Alexander	Khoo	Purchasing Clerk	Seattle	Washington
Shelli	Baida	Purchasing Clerk	Seattle	Washington
Sigal	Tobias	Purchasing Clerk	Seattle	Washington
Guy	Himuro	Purchasing Clerk	Seattle	Washington
Karen	Colmenares	Purchasing Clerk	Seattle	Washington

18. Retrieve the department names along with the count of employees in each department.

```
SELECT d.department_name, COUNT(e.employee_id) AS total_employees
FROM employees e
JOIN departments d ON e.department_id = d.department_id
GROUP BY d.department_name;
```

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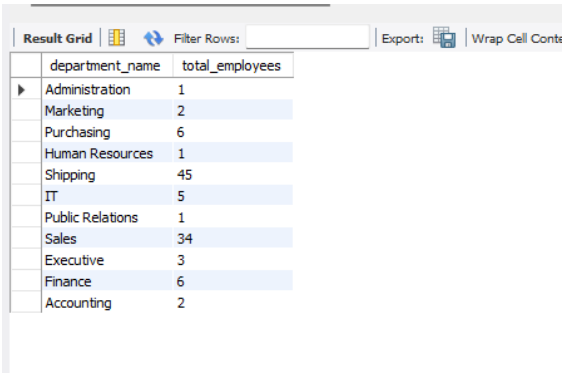
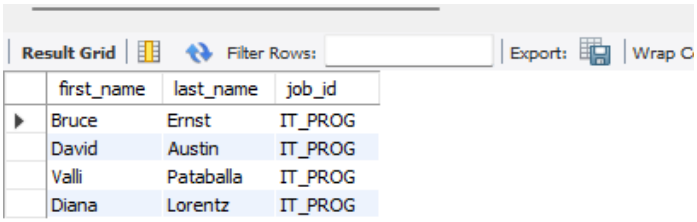


department_name	total_employees
Administration	1
Marketing	2
Purchasing	6
Human Resources	1
Shipping	45
IT	5
Public Relations	1
Sales	34
Executive	3
Finance	6
Accounting	2

19. Find employees who have the same job as their manager.

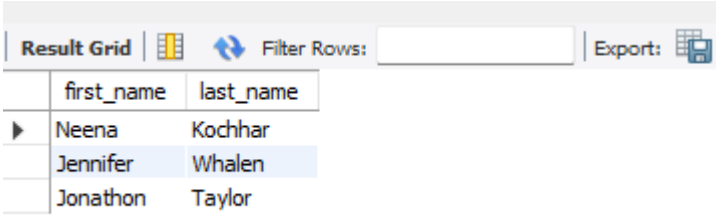
```
SELECT e.first_name, e.last_name, e.job_id
FROM employees e
JOIN employees m ON e.manager_id = m.employee_id
WHERE e.job_id = m.job_id;
```



first_name	last_name	job_id
Bruce	Ernst	IT_PROG
David	Austin	IT_PROG
Valli	Pataballa	IT_PROG
Diana	Lorentz	IT_PROG

20. Display the names of employees who worked in different jobs in the past (use job_history).

```
SELECT e.first_name, e.last_name
FROM employees e
JOIN job_history jh ON e.employee_id = jh.employee_id
GROUP BY e.employee_id, e.first_name, e.last_name
HAVING COUNT(jh.job_id) > 1;
```



first_name	last_name
Neena	Kochhar
Jennifer	Whalen
Jonathon	Taylor