Project SQL
Database Management

Mason Scercy

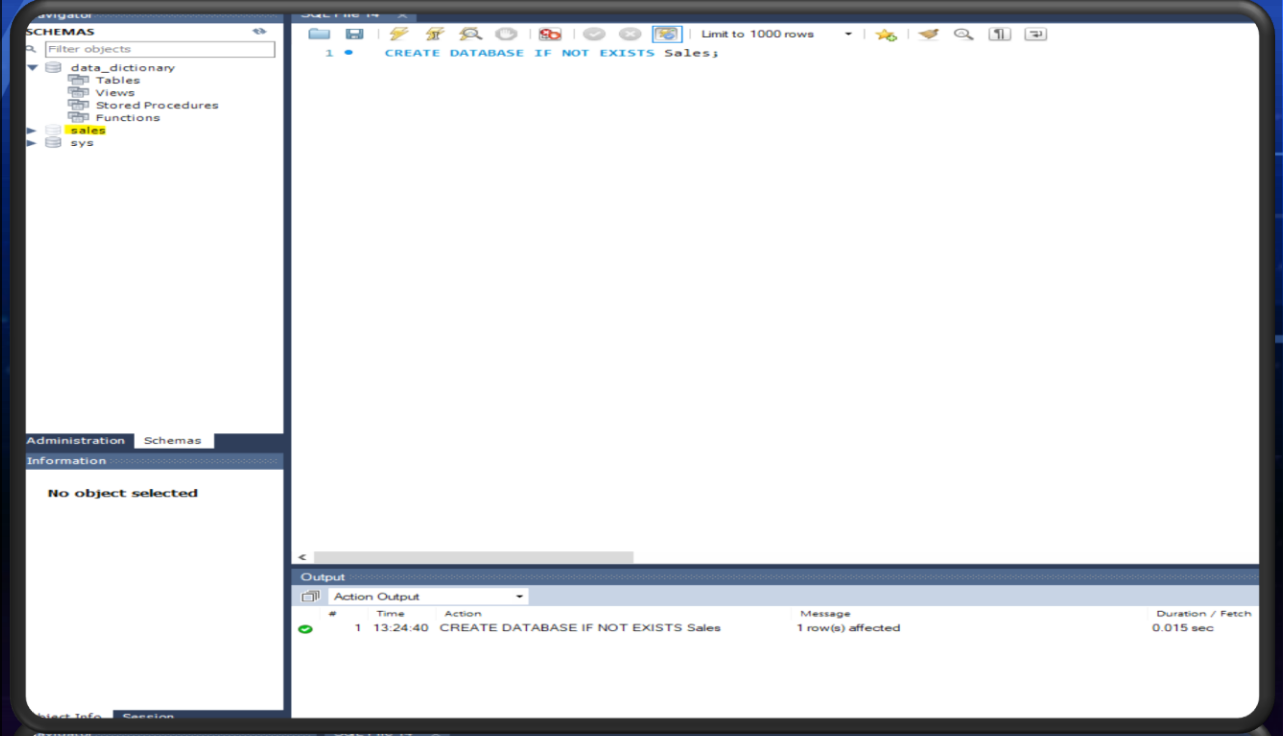
Introduction

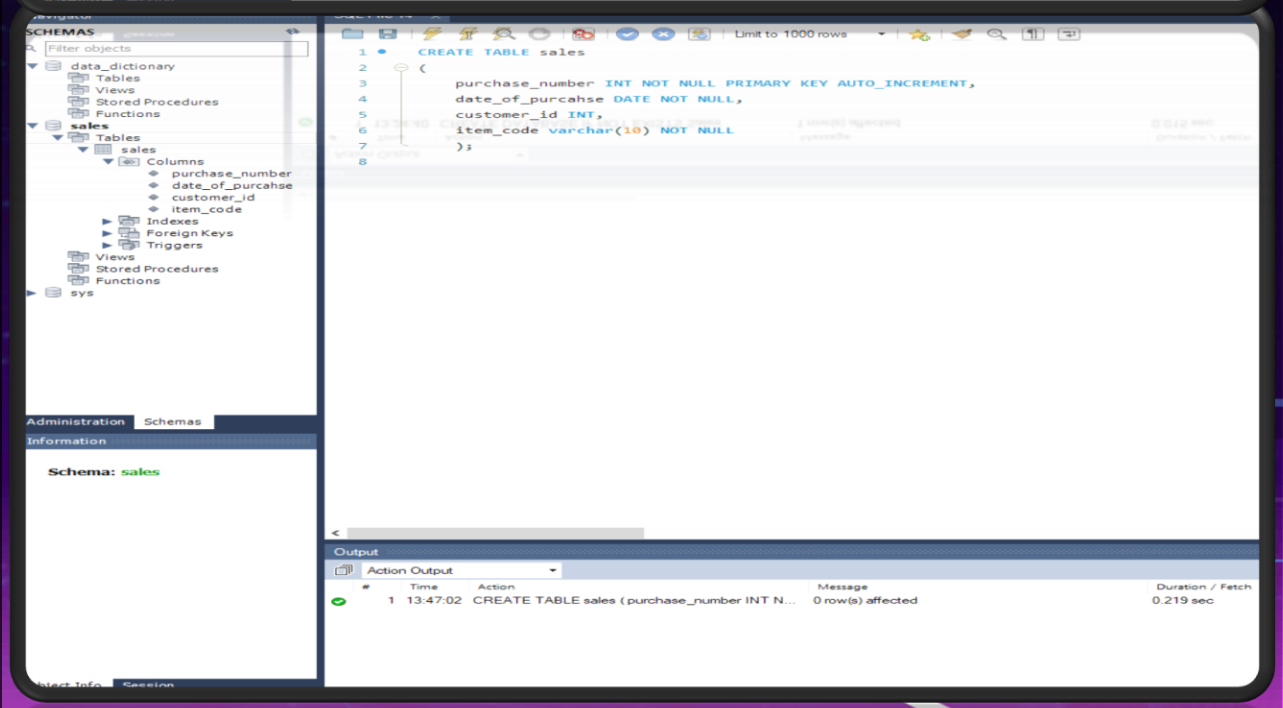
Structured Query Language(SQL) is used in relational databases to extract and manipulate data.

- Database and table creation
- Data extraction
- Table Manipulation with JOINs
- Query and Subquery writing

Database and Table Creation

```
102
103    # shows only the current department for each employee
104    CREATE OR REPLACE VIEW current_dept_emp AS
105        SELECT l.emp_no, dept_no, l.from_date, l.to_date
106        FROM dept_emp d
107            INNER JOIN dept_emp_latest_date l
108            ON d.emp_no=l.emp_no AND d.from_date=l.from_date AND l.to_date = d.to_date;
109
110    flush /*!50503 binary */ logs;
111
112    INSERT INTO `employees` VALUES (10001,'1953-09-02','Georgi','Facello','M','1986-06-26'),
113    (10002,'1964-06-02','Bezalel','Simmel','F','1985-11-21'),
114    (10003,'1959-12-03','Parto','Bamford','M','1986-08-28'),
115    (10004,'1954-05-01','Chirstian','Koblick','M','1986-12-01'),
```





DATA EXTRACTION

Greater than

```
2        *
3    FROM
4        salaries
5    WHERE salary >= 150000
6    ORDER BY salary DESC
7    LIMIT 10;
8
9
10
11
12
13
14
15
```

Result Grid | Filter Rows: | Edit:

emp_no	salary	from_date	to_date
43624	158220	2002-03-22	9999-01-01
43624	157821	2001-03-22	2002-03-22
47978	155709	2002-07-14	9999-01-01
109334	155377	2000-02-12	2001-02-11
109334	155190	2002-02-11	9999-01-01
109334	154888	2001-02-11	2002-02-11
109334	154885	1999-02-12	2000-02-12
80823	154459	2002-02-22	9999-01-01
43624	153458	2000-03-22	2001-03-22
43624	153166	1999-03-23	2000-03-22
NULL	NULL	NULL	NULL

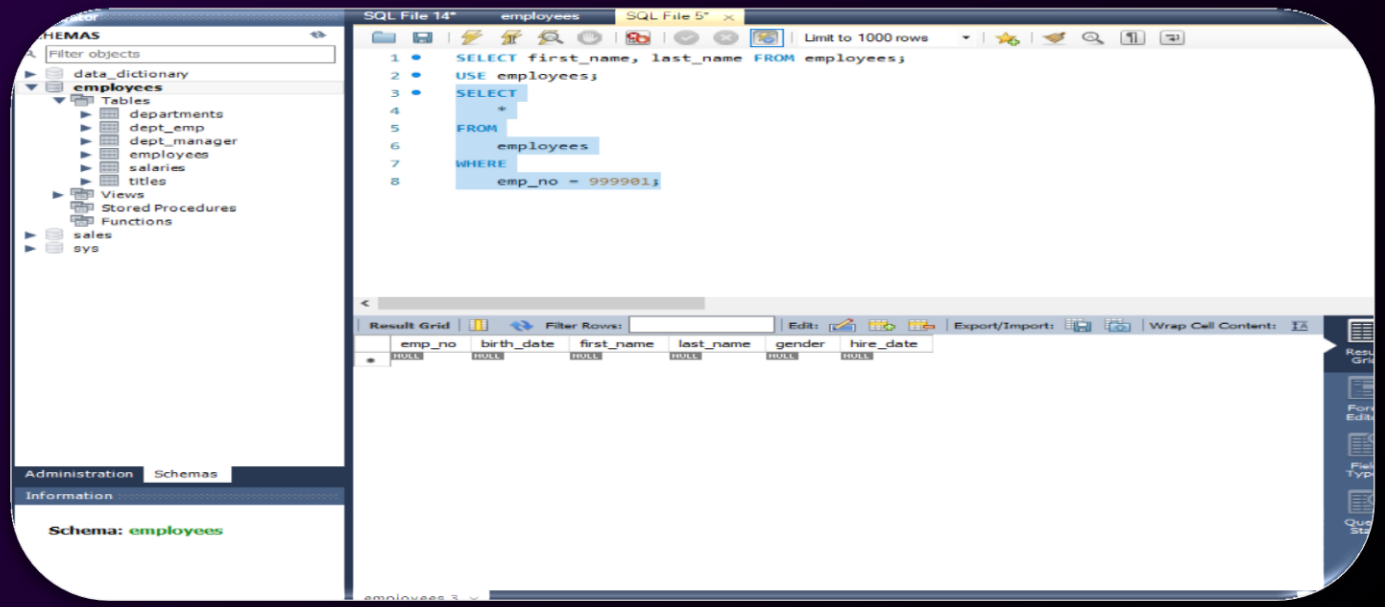
Like

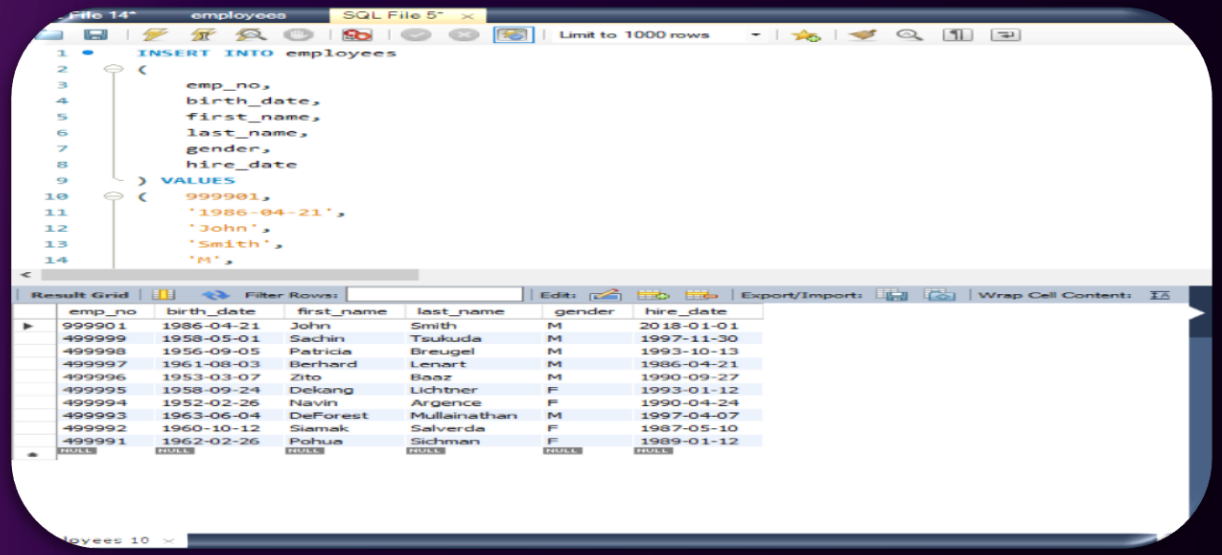
```
1    SELECT
2        *
3    FROM
4        employees
5    WHERE first_name LIKE('M%k')
6    ORDER BY emp_no
7    LIMIT 10;
8
9
10
11
12
13
14
```

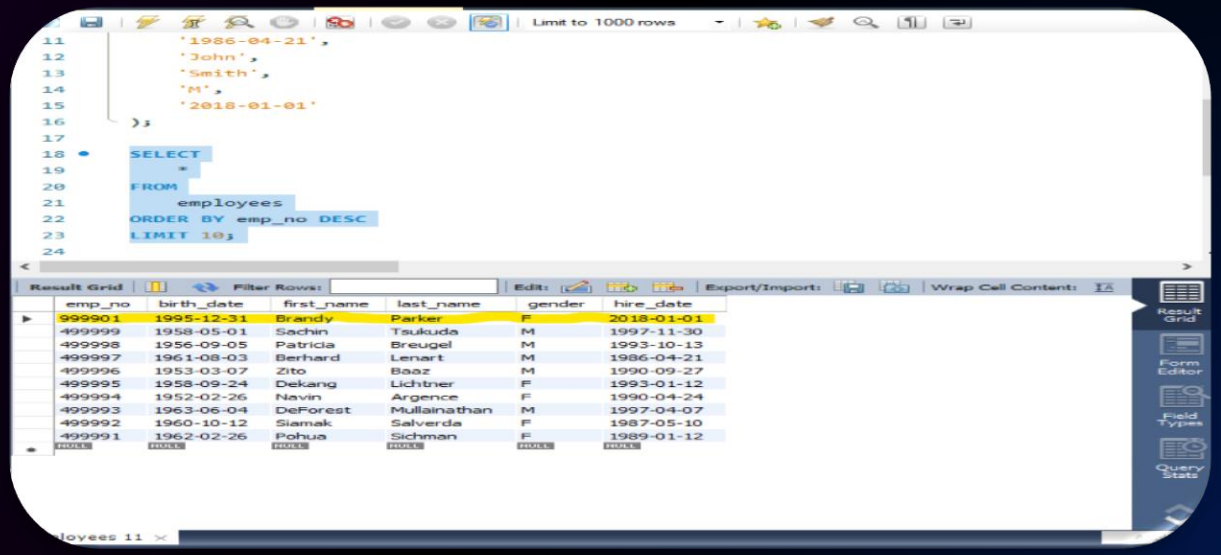
Result Grid | Filter Rows: | Edit:

emp_no	birth_date	first_name	last_name	gender	hire_date
10275	1961-10-22	Marek	Luck	F	1987-09-08
10415	1957-11-12	Mark	Coorg	M	1993-10-25
10478	1957-03-08	Maik	Ushiama	M	1992-06-09
10499	1953-10-04	Maik	Luft	F	1989-11-23
10939	1964-07-13	Matk	Akazan	M	1990-11-01
10996	1955-02-01	Matk	Rahimi	F	1990-02-07
11202	1964-11-01	Marek	Ranon	F	1985-02-17
11236	1963-01-27	Marek	Orlowska	M	1994-03-24
11246	1964-11-16	Maik	Reinhart	M	1992-01-14
11370	1956-12-21	Marek	Erie	M	1989-08-22

Table Manipulation Inset & Update







Aggregate

```sql
## How much is the company paying out in salaries
SELECT
    SUM(salary)
FROM
    salaries;
```

SUM(salary)
61678125784

```sql
# What is the average salary the company pays out
SELECT
    ROUND(AVG(salary))
FROM
    salaries
```

ROUND(AVG(salary))
63761

```sql
# What is maximum salary the company pays out
SELECT
    MAX(salary)
FROM
    salaries;
```

```sql
SELECT
    *
FROM
    salaries
ORDER BY salary DESC
LIMIT 10;

## Count the total number of salaries being paid out
SELECT
    COUNT(salary)
FROM
    salaries;
```

COUNT(salary)
967330

```sql
## What is the minimum salary
SELECT
    MIN(salary)
FROM
    salaries;
```

MIN(salary)
38735

Table Manipulation W/ Join Tables

Departments

```
45 •  SELECT
46        *
47    FROM
48        departments_dup
```

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

dept_no	dept_name
d009	Customer Service
d005	Development
d003	Human Resources
d001	Marketing
d004	Production
d006	Quality Management
d008	Research
d007	Sales
NULL	Public Relations
d010	NULL
d011	NULL
d009	Customer Service
d009	Customer Service

departments_dup 12

Dept_manager

```
45 •  SELECT
46        *
47    FROM
48        dept_manager_dup
```

Result Grid | Filter Rows: | Expor

emp_no	dept_no	from_date	to_date
110085	d002	1985-01-01	1989-12-17
110114	d002	1989-12-17	9999-01-01
110183	d003	1985-01-01	1992-03-21
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
111035	d007	1985-01-01	1991-03-07
111133	d007	1991-03-07	9999-01-01
111400	d008	1985-01-01	1991-04-08
111534	d008	1991-04-08	9999-01-01

dept_manager_dup 13

INNER, RIGHT, LEFT & CROSS JOINS

```
SELECT DISTINCT emp_no, dept_no, from_date
FROM dept_manager_dup;

SELECT
    e.emp_no, e.first_name, e.last_name, dm.dept_no, e.hire_date
 FROM
    employees e
JOIN
    dept_manager dm ON e.emp_no = dm.emp_no;
```

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

emp_no	first_name	last_name	dept_no	hire_date
110022	Margareta	Markovitch	d001	1985-01-01
110039	Vishwani	Minakawa	d001	1986-04-12
110085	Ebru	Alpin	d002	1985-01-01
110114	Isamu	Legleitner	d002	1985-01-14
110183	Shirish	Ossenbruggen	d003	1985-01-01
110228	Karsten	Sigstam	d003	1985-08-04
110303	Krassimir	Wegerle	d004	1985-01-01
110344	Rosine	Cools	d004	1985-11-22
110386	Shem	Kieras	d004	1988-10-14
110420	Oscar	Ghazalie	d004	1992-02-05
110511	DeForest	Hagimont	d005	1985-01-01
110567	Leon	DasSarma	d005	1986-10-21
110725	Peternela	Onuegbe	d006	1985-01-01
110765	Rutger	Hofmeyr	d006	1989-01-07
110800	Sanjoy	Quadeer	d006	1986-08-12
110854	Dung	Pesch	d006	1989-06-09
111035	Przemysla...	Kaelbling	d007	1985-01-01

```
## Left Joins
SELECT m.dept_no, m.emp_no, d.dept_name
FROM dept_manager_dup m
LEFT JOIN departments_dup d on m.dept_no = d.dept_no
ORDER BY m.dept_no;
```

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

dept_no	emp_no	dept_name
NULL	999904	NULL
NULL	999905	NULL
NULL	999906	NULL
NULL	999907	NULL
d002	110114	NULL
d002	110085	NULL
d003	110183	Human Resources
d003	110228	Human Resources
d004	110303	Production
d004	110344	Production
d004	110386	Production
d004	110420	Production
d005	110511	Development
d005	110567	Development
d006	110725	Quality Managem...
d006	110765	Quality Managem...
d006	110800	Quality Managem...

Result 39

```
## Left Joins
SELECT m.dept_no, m.emp_no, d.dept_name
FROM dept_manager_dup m
RIGHT JOIN departments_dup d on m.dept_no = d.dept_no
ORDER BY m.dept_no;
```

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

dept_no	emp_no	dept_name
NULL	NULL	Marketing
NULL	NULL	Customer Service
NULL	NULL	Public Relations
NULL	NULL	NULL
NULL	NULL	NULL
NULL	NULL	Customer Service
NULL	NULL	Customer Service
d003	110183	Human Resources
d003	110228	Human Resources
d004	110420	Production
d004	110303	Production
d004	110344	Production
d004	110386	Production
d005	110511	Development
d005	110567	Development
d006	110765	Quality Managem...
d006	110800	Quality Managem...

```
SELECT dm.*, d.*
FROM
    departments d
        CROSS JOIN
    dept_manager dm
WHERE
    d.dept_no <> dm.dept_no
ORDER BY dm.emp_no, d.dept_no;
```

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

emp_no	dept_no	from_date	to_date	dept_no	dept_name
110022	d001	1985-01-01	1991-10-01	d002	Finance
110022	d001	1985-01-01	1991-10-01	d003	Human Resources
110022	d001	1985-01-01	1991-10-01	d004	Production
110022	d001	1985-01-01	1991-10-01	d005	Development
110022	d001	1985-01-01	1991-10-01	d006	Quality Management
110022	d001	1985-01-01	1991-10-01	d007	Sales
110022	d001	1985-01-01	1991-10-01	d008	Research
110022	d001	1985-01-01	1991-10-01	d009	Customer Service
110039	d001	1991-10-01	9999-01-01	d002	Finance
110039	d001	1991-10-01	9999-01-01	d003	Human Resources
110039	d001	1991-10-01	9999-01-01	d004	Production
110039	d001	1991-10-01	9999-01-01	d005	Development
110039	d001	1991-10-01	9999-01-01	d006	Quality Management
110039	d001	1991-10-01	9999-01-01	d007	Sales
110039	d001	1991-10-01	9999-01-01	d008	Research
110039	d001	1991-10-01	9999-01-01	d009	Customer Service
110085	d002	1985-01-01	1989-12-17	d001	Marketing

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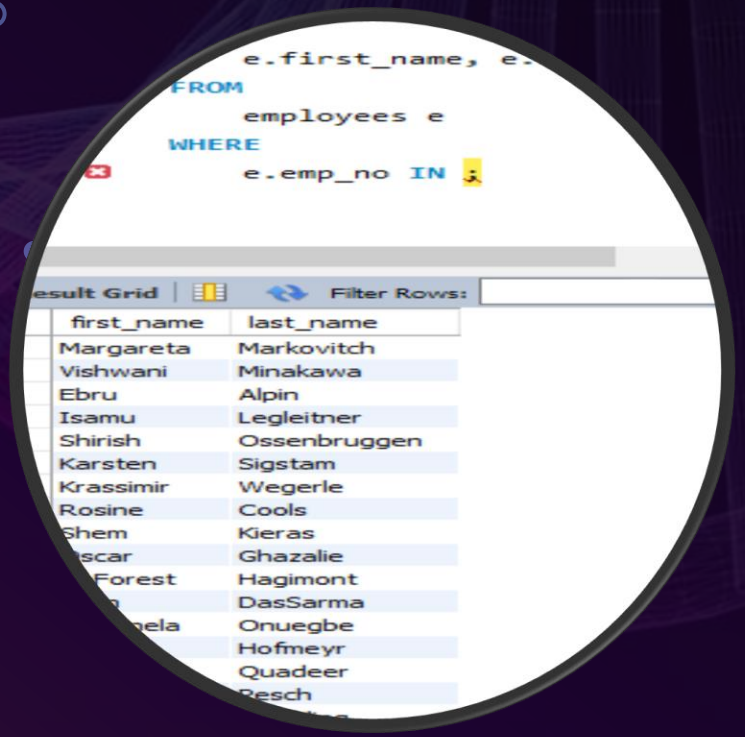
SUBQUERIES

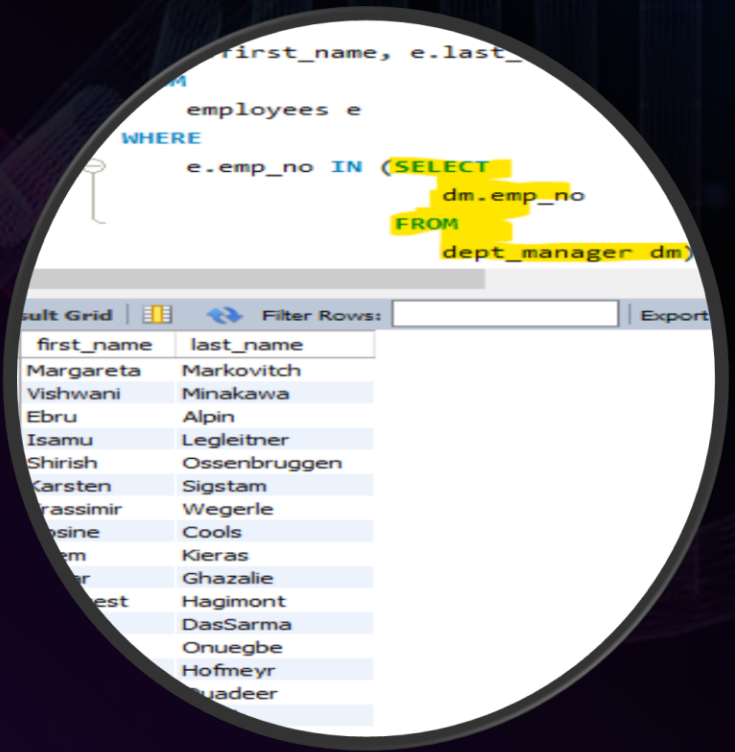
NESTED, INNER, & OUTER

NESTED with 'IN'

OUTER



INNER



NESTED Inside ‘SELECT & FROM’

- ✓ Outer query “SELECT down to ORDER BY”
- ✓ Inner Subquery is inside the parenthesis's

```
19  SELECT
20      e.emp_no as employee_ID,
21      MIN(de.dept_no) AS department_code,
22      (SELECT
23          emp_no
24      FROM
25          dept_manager
26      WHERE
27          emp_no = 110022) AS manager_ID
28  FROM
29      employees e
30          JOIN
31      dept_emp de ON e.emp_no = de.emp_no
32  WHERE
33      e.emp_no >= 10020
34  GROUP BY e.emp_no
35  ORDER BY e.emp_no;
```

Result Grid | Filter Rows: | Export:

employee_ID	department_code	manager_ID
10020	d004	110022
10021	d005	110022
10022	d005	110022
10023	d005	110022
10024	d004	110022
10025	d005	110022
10026	d004	110022
10027	d005	110022
10028	d005	110022
10029	d004	110022
10030	d004	110022
10031	d005	110022
10032	d004	110022
10033	d006	110022

Thank you

MASON SCERCY

980-226-6632

scercy.mason@gmail.com

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