SESSIONS 1

Working with Multiple Tables

Data Science Program

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Access Multiple Tables

Methods to access multiple tables in the same query

1. Sub-queries
2. Implicit JOIN
3. JOIN operators (INNER JOIN, OUTER JOIN, etc.)

Sub-Queries

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Sub-Queries

Sub-queries can be used to access multiple tables. For example, we can access EMPLOYEE & TITLE table.

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

Employees Tables

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

Titles Tables

Sub-Queries

Retrieve the **employee** records that correspond to **emp_no** in the TITLES table:

```
select * from employees
    where EMP_NO IN
    (select EMP_NO from titles);
```

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

Sub-Queries

Retrieve the **employee** records that correspond to **emp_no** in the TITLES table and **only has 'Senior Staff'** title:

```
select * from employees
    where EMP_NO IN
    (select EMP_NO from titles
    where title = 'Senior Staff');
```

emp_no	birth_date	first_name	last_name	gender	hire_date
10005	1955-01-21	Kyoichi	Maliniak	M	1989-09-12
10007	1957-05-23	Tzvetan	Zielinski	F	1989-02-10
10013	1963-06-07	Eberhardt	Terkki	M	1985-10-20
10015	1959-08-19	Guoxiang	Nooteboom	M	1987-07-02
10017	1958-07-06	Cristinel	Bouloucos	F	1993-08-03
10036	1959-08-10	Adamantios	Portugali	M	1992-01-03
10038	1960-07-20	Huan	Lortz	M	1989-09-20
10039	1959-10-01	Alejandro	Brender	M	1988-01-19
10041	1959-08-27	Uri	Lenart	F	1989-11-12
10042	1956-02-26	Magy	Stamatiou	F	1993-03-21

Sub-Queries

Retrieve the **employee** records that have **salary above US$ 60K** in SALARIES table:

```
select first_name, last_name, gender, birth_date
from employees
    where EMP_NO IN
    (select EMP_NO from salaries
    where salary > 60000);
```

first_name	last_name	gender	birth_date
Georgi	Facello	M	1953-09-02
Bezalel	Simmel	F	1964-06-02
Chirstian	Koblick	M	1954-05-01
Kyoichi	Maliniak	M	1955-01-21
Anneke	Preusig	F	1953-04-20
Tzvetan	Zielinski	F	1957-05-23
Sumant	Peac	F	1952-04-19
Duangkaew	Piveteau	F	1963-06-01
Eberhardt	Terkki	M	1963-06-07
Berni	Genin	M	1956-02-12

Implicit Join

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Implicit JOIN

Specify 2 tables in the FROM clause:

```
Select * from employees, salaries;
```

The result is a full join (or Cartesian join):

- Every row in the first table is joined with every row in the second table
- The result set will have more rows than in both tables

Implicit JOIN

Use additional operands to limit the result set:

```
select * from employees, salaries
where employees.emp_no = salaries.emp_no;
```

Use shorter aliases for table names:

```
select * from employees E, salaries S
where E.emp_no = S.emp_no;
```

Implicit JOIN

See **first_name, last_name, and salary** from EMPLOYEE & SALARIES tables.
Column names in the select clause can be pre-fixed by aliases:

```
select E.first_name, E.last_name, S.salary
from employees E, salaries S
where E.emp_no = S.emp_no;
```

first_name	last_name	salary
Florian	Syrotiuk	39507
Divier	Reistad	39520
Basil	Tramer	39735
Pradeep	Makrucki	39765
Shahaf	Famili	39935
Anneke	Preusig	40000
Patricio	Bridgland	40000
Eberhardt	Terkki	40000

Reference

- https://www.w3resource.com/sql/subqueries/understanding-sql-subqueries.php
- https://www.w3schools.com/sql/sql_join.asp

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