

SQL: PART II

Example: Employee Database

EMPLOYEE				
emp_id	name	dept_id	mgr_id	salary
57	Alex	1	-	84000
23	Jen	1	57	72000
85	Max	3	19	51000
44	Tim	2	37	63000

DEPARTMENT	
dept_id	name
1	Sales
2	Accounting
3	HR

Query #1

- *Find all employees in the Sales and HR departments.*

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```
select e.name
from employee as e, department as d
where e.dept_id = d.dept_id
      and (d.name = 'Sales'
           or d.name = 'HR')
```

OR

```
select e.name
from employee as e
join department as d
  on d.dept_id = e.dept_id
where d.name = 'Sales'
      or d.name = 'HR'
```

Query #1

- *Find all employees in the Sales and HR departments.*

```
select e.name
from employee as e
where e.dept_id in (
    select d.dept_id
    from department as d
    where d.name = 'Sales'
    or d.name = 'HR')
```

**IN + SUBQUERY
(WHERE CLAUSE)**

Query #2

- *Find all employees with the maximum salary.*

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```
select e.name
from employee as e
where e.salary = (
    select max(e2.salary)
    from employee as e2)
```

SCALAR SUBQUERY (WHERE CLAUSE)

Query #2

- *Find all employees with the maximum salary.*

```
select e.name
from employee as e
join (
    select max(e2.salary) as maxsal
    from employee as e2)
on e.salary = maxsal
```

**SUBQUERY
(FROM CLAUSE)**

Query #3

- *Find the average salary for each department.*

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```
select d.name,  
       avg(e.salary) as avgsal  
from department as d  
join employee as e  
  on e.dept_id = d.dept_id  
group by d.name
```

Query #3

- *Find the average salary for each department.*

```
select d.name,  
       (select avg(e.salary)  
        from employee e  
        where e.dept_id = d.dept_id)  
       as avgsal  
from department as d
```

**SCALAR SUBQUERY
(SELECT CLAUSE)**

Query #4

- *Find the departments with at most one manager.*

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```
select d.name
from department as d
join employee as e
  on e.dept_id = d.dept_id
where e.mgr_id is null
group by d.name
having count(e.emp_id) <= 1
```

Query #4

- *Find the departments with at most one manager.*

```
select d.name
from department as d
where unique (
    select e.dept_id
    from employee as e
    where e.dept_id = d.dept_id
    and e.mgr_id is null)
```

UNIQUE

Query #5

- *Find all managers who supervise at least one employee.*

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- *Find all managers who supervise at least one employee.*

```
select e.name
from employee as e
where exists (
    select *
    from employee as e2
    where e2.mgr_id = e.emp_id)
```

EXISTS

Query #6

- *Find the names of all employees and their manager.*

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- *Find the names of all employees and their manager.*

```
select e.name as emp,  
       m.name as mgr  
from employee as e  
join employee as m  
  on m.emp_id = e.mgr_id
```

PROBLEM?

Query #6

- *Find the names of all employees and their manager.*

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Query #6

- *Find the names of all employees and their manager.*

```
select e.name as emp,  
       m.name as mgr  
from employee as e  
join employee as m  
  on m.emp_id = e.mgr_id  
union  
select e.name,  
       'n/a'  
from employee as e  
where e.mgr_id is null
```

Query #6

- Find the names of all employees and their manager.

```
select e.name as emp,  
       m.name as mgr  
from employee as e  
left outer join employee as m  
  on m.emp_id = e.mgr_id
```

LEFT OUTER JOIN

Query #7

- *Find all departments where the total salary is greater than the average total salary for all departments.*

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- *Find all departments where the total salary is greater than the average total salary for all departments.*

```
with dept_ttl as (  
    select dept_id, sum(salary) as dttl  
    from employee group by dept_id),  
with dept_avg as (  
    select avg(dttl) as davg  
    from dept_ttl)  
select dept_id  
from dept_ttl as t1, dept_avg as t2  
where t1.dttl > t2.davg
```

WITH CLAUSE

Modifying a Table

- **insert** – add new records
- **delete** – remove some (or all) records
- **update** – change some (or all) existing records

Insert

- Add a new record to the EMPLOYEE table:

```
insert into  
employee(id,name,dept_id,mgr_id,salary)  
values(99,'Amy',2,16,95000)
```

Insert

- Add a new record to the EMPLOYEE table:

```
insert into  
employee  
values (99, 'Amy', 2, 16, 95000)
```

Insert

- Add a new record to the EMPLOYEE table:

```
insert into  
employee  
values (99, 'Amy', 2, null, 95000)
```

Insert

- Add all managers to the new MANAGER table:

```
insert into manager  
  select *  
  from employee  
  where mgr_id is null
```

Delete

- Delete all employees from the `EMPLOYEE` table:

```
delete from employee
```

Delete

- Delete employee #44:

```
delete from employee  
where emp_id = 44
```

Delete

- Delete all employees in the Sales department:

```
delete from employee
where dept_id = (
    select dept_id
    from department
    where name = 'Sales')
```

Delete

- Delete all employees whose salary is greater than the average salary:

```
delete from employee
where salary > (
    select avg(salary)
    from employee)
```

PROBLEM?

Update

- Make employee #23 a manager:

```
update employee  
set mgr_id = null  
where emp_id = 23
```

Update

- Give all employees a 5% raise:

```
update employee  
set salary = salary * 1.05
```

Update

- Give all employees with a salary greater than \$100,000 a 3% raise and all others a 5% raise:

```
update employee  
set salary = salary * 1.05  
where salary <= 100000
```

```
update employee  
set salary = salary * 1.03  
where salary > 100000
```

PROBLEM?

Update

- Give all employees with a salary greater than \$100,000 a 3% raise and all others a 5% raise:

```
update employee
set salary = case
    when salary > 100000
    then salary * 1.03
else
    salary * 1.05
end
```

CASE STATEMENT

**If you disliked the lecture, please
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