

## Conditions in SQL

Examples (company)

```
SELECT Iname, SSN
FROM employee
WHERE salary > 40000
```

```
SELECT Iname, SSN
FROM employee, department
WHERE dno = dnumber and
dname = 'Research'
```

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## Boolean Logic

George Boole (1815-1864): Laws of Thought (1854)



Operators    and  
                  or  
                  not

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## Truth-tables

p	not p
false	true
true	false

p	q	p and q
false	false	false
false	true	false
true	false	false
true	true	true

DeMorgan's rule

p	q	p or q
false	false	false
false	true	true
true	false	true
true	true	true

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## Condition examples

Company

- Female employees who make less than 30000
- Employees which are older than 40 and employees younger than 30
- Employees which are older than 60, unless they make more than 45000
- SSNs of dependents which are not spouses

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## More examples

Company

- Male employees which work for administration or research departments
- Employees working on both the Newbenefits and the ProjectX projects
- Departments located in Houston and Stafford
- Names of employees with dependent children

•Departments not located in Houston?  
•Employees without dependents?

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## Set Operations

UNION (union)  
INTERSECT (intersection)  
EXCEPT (MINUS) (set difference)

{Alice, Queen} UNION {Alice, King}  
= {King, Alice, Queen}

{Alice, Queen} INTERSECT {Alice, King}  
= {Alice}

{Alice, Queen} EXCEPT {Alice, King}  
= {Queen}

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## Duplicates with Set Operations

Duplicates are eliminated if we use set operations like

UNION	(union)
INTERSECT	(intersection)
EXCEPT	(set difference)

Example (Company):

- List the SSN of all employees working for department 5, or supervising somebody in department 5
- List employees working on both ProductX and ProductY
- Departments not located in Houston

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## Intersection and Difference

Not supported by either Access or SQLServer.

Example workaround for intersection:

Managers that are supervisors

```
SELECT fname, lname, ssn
FROM employee AS e, employee AS s,
     department AS d
WHERE s.ssn = e.superssn AND
     s.ssn = d.mgrssn
```

More general solution (also for difference) later.

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## Null Values

Comparisons with null values always fail.

```
SELECT *
FROM employee
WHERE superssn = superssn;
```

← will not list James Borg

Use **is null** and **is not null**

SELECT *	SELECT *
FROM employee	FROM employee
WHERE superssn is null;	WHERE superssn is not null;

Example

- All employees for which we have address info
- Employees which are missing first or last name

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