

- Relational Database Essentials
- MySQL Constraints
- SELECT, INSERT, UPDATE, DELETE
- MySQL Aggregate Functions
- INNER JOIN, LEFT JOIN, RIGHT JOIN

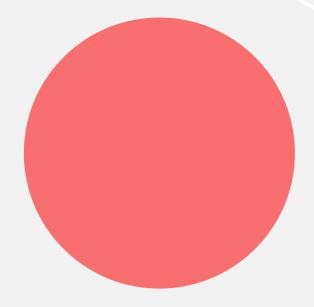
#### Next:

- Relational Database Essentials
- MySQL Constraints
- SELECT, INSERT, UPDATE, DELETE
- MySQL Aggregate Functions
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- Relational Database Essentials
- MySQL Constraints
- SELECT, INSERT, UPDATE, DELETE Advanced SQL Tools
- MySQL Aggregate Functions
- INNER JOIN, LEFT JOIN, RIGHT JOIN

#### Next:

- Subqueries, Self-joins
- Stored Routines



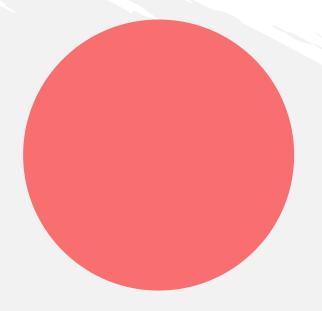
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dept\_no CHAR(4)

emp\_no INT

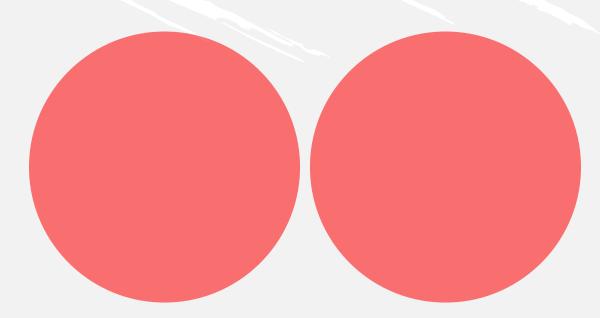
from\_date DATE

to\_date DATE



departments\_dup

dept\_no CHAR(4)



#### dept\_manager\_dup

dept\_no CHAR(4)

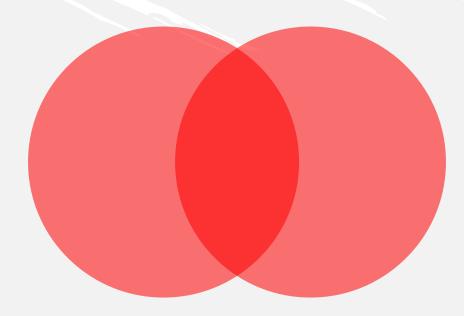
emp\_no INT

from\_date DATE

to\_date DATE

### departments\_dup

dept\_no CHAR(4)



#### dept\_manager\_dup

dept\_no CHAR(4)

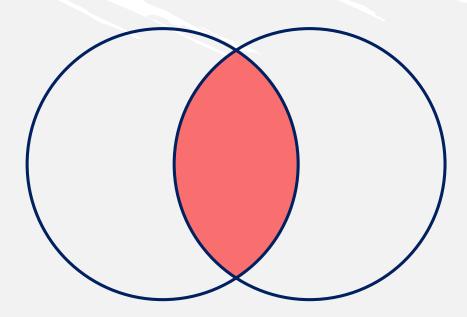
emp\_no INT

from\_date DATE

to\_date DATE

#### departments\_dup

dept\_no CHAR(4)



#### dept\_manager\_dup

dept\_no CHAR(4)

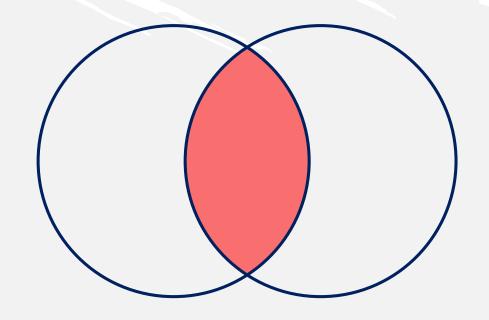
emp\_no INT

from\_date DATE

to\_date DATE

#### departments\_dup

dept\_no CHAR(4)



#### dept\_manager\_dup

dept\_no CHAR(4)

emp\_no INT

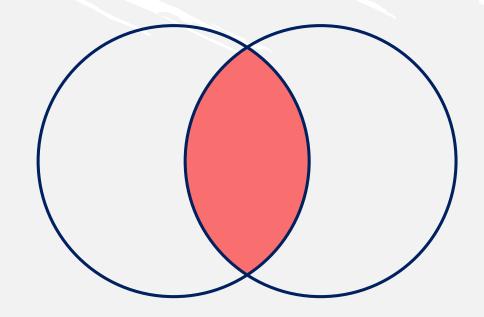
from\_date DATE

to\_date DATE

### departments\_dup

dept\_no CHAR(4)





#### dept\_manager\_dup

dept\_no CHAR(4)

emp\_no INT

from\_date DATE

to\_date DATE

### connection points

#### departments\_dup

dept\_no CHAR(4)



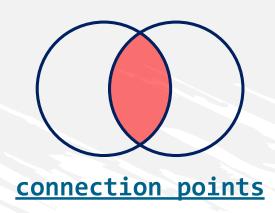
#### dept\_manager\_dup

dept\_no CHAR(4)

emp\_no INT

from\_date DATE

to\_date DATE



#### departments\_dup

dept\_no CHAR(4)



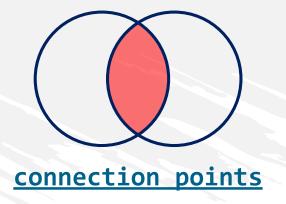
MOLL MOLL	2017-01-01 2017-01-01 2017-01-01	NULL NULL
NULL		
	2017-01-01	MITT
NULL		
	2017-01-01	HULL
d002	1985-01-01	1989-12-17
d002	1989-12-17	9999-01-01
d003	1985-01-01	1992-03-21
d003	1992-03-21	9999-01-01
d004	1985-01-01	1988-09-09
d004	1988-09-09	1992-08-02
d004	1992-08-02	1996-08-30
d004	1996-08-30	9999-01-01
d005	1985-01-01	1992-04-25
d005	1992-04-25	9999-01-01
d006	1985-01-01	1989-05-06
d006	1989-05-06	1991-09-12
d006	1991-09-12	1994-06-28
d006	1994-06-28	9999-01-01
d007	1985-01-01	1991-03-07
d007	1991-03-07	9999-01-01
d008	1985-01-01	1991-04-08
d008	1991-04-08	9999-01-01
d009	1985-01-01	1988-10-17
d009	1988-10-17	1992-09-08
d009	1992-09-08	1996-01-03
d009	1996-01-03	9999-01-01
	d002 d003 d003 d004 d004 d004 d005 d005 d006 d006 d006 d006 d006 d007 d008 d008 d009 d009	d002         1985-01-01           d002         1989-12-17           d003         1985-01-01           d003         1992-03-21           d004         1985-01-01           d004         1988-09-09           d004         1992-08-02           d004         1996-08-30           d005         1985-01-01           d005         1995-04-25           d006         1991-09-12           d006         1991-09-12           d006         1991-09-12           d007         1995-01-01           d007         1991-03-07           d008         1995-01-01           d009         1985-01-01           d009         1985-01-01           d009         1988-10-17           d009         1992-09-08

dept_no	emp_no	dept_name
d003	110228	Human Resources
d003	110183	Human Resources
d004	110344	Production
d004	110420	Production
d004	110303	Production
d004	110386	Production
d005	110567	Development
d005	110511	Development
d006	110800	Ouality Management
d006	110765	Ouality Management
d006	110854	Ouality Management
d006	110725	Ouality Management
d007	111035	Sales
d007	111133	Sales
d008	111400	Research
d008	111534	Research
d009	111784	Customer Service
d009	111939	Customer Service
d009	111692	Customer Service
d009	111877	Customer Service

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

#### dept\_manager\_dup

dept\_no CHAR(4)
emp\_no INT
from\_date DATE
to\_date DATE



#### departments\_dup

dept\_no CHAR(4)



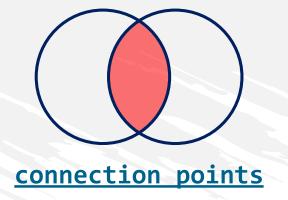
emp_no	dept_no	from_date	to_date
999904	NULL X	2017-01-01	HULL
999905	NULL X	2017-01-01	HULL
999906	NULL X	2017-01-01	NULL
999907	NULL X	2017-01-01	HULL
110085	d002 X	1985-01-01	1989-12-17
110114	d002 X	1989-12-17	9999-01-01
110183	d003 🗸	1985-01-01	1992-03-21
110228	d003 🗸	1992-03-21	9999-01-01
110303	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
111692	d009 🗸	1985-01-01	1988-10-17
111784	d009 🗸	1988-10-17	1992-09-08
111877	d009 🗸	1992-09-08	1996-01-03
111939	d009 🗸	1996-01-03	9999-01-01

	dept_no	emp_no	dept_name
	d003	110228	Human Resources
	d003	110183	Human Resources
	d004	110344	Production
	d004	110420	Production
	d004	110303	Production
	d004	110386	Production
	d005	110567	Development
	d005	110511	Development
	d006	110800	Ouality Management
	d006	110765	Ouality Management
	d006	110854	Ouality Management
	d006	110725	Ouality Management
	d007	111035	Sales
	d007	111133	Sales
(	d008	111400	Research
	d008	111534	Research
	d009	111784	Customer Service
	d009	111939	Customer Service
	d009	111692	Customer Service
	d009	111877	Customer Service

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

#### dept\_manager\_dup

dept\_no CHAR(4)
emp\_no INT
from\_date DATE
to\_date DATE



#### departments\_dup

dept\_no CHAR(4)



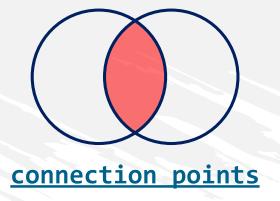
emp_no	dept_no	from_date	to_date
999904	NULL X	2017-01-01	NULL
999905	NULL X	2017-01-01	NULL
999906	NULL X	2017-01-01	NULL
999907	NULL X	2017-01-01	NULL
110085	d002 X	1985-01-01	1989-12-17
110114	d002 X	1989-12-17	9999-01-01
110183	d003 🗸	1985-01-01	1992-03-21
110228	d003 🗸	1992-03-21	9999-01-01
110303	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
111692	d009 🗸	1985-01-01	1988-10-17
111784	d009 🗸	1988-10-17	1992-09-08
111877	d009 🗸	1992-09-08	1996-01-03
111939	d009 🗸	1996-01-03	9999-01-01

aept_no	emp_no	dept_name
d003	110228	Human Resources
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d009	111939	Customer Service
d009	111692	Customer Service
d009	111877	Customer Service

dept_no		dept_name
NULL	X	Public Relations
d001	X	Marketing
d003	<b>/</b>	Human Resources
d004	<b>V</b>	Production
d005	<b>/</b>	Development
d006	<b>Y</b>	Ouality Management
d007	<b>V</b>	Sales
d008	<b>/</b>	Research
d009	<b>Y</b>	Customer Service
d010	X	NULL
d011	X	NULL

#### dept\_manager\_dup

dept\_no CHAR(4)
emp\_no INT
from\_date DATE
to\_date DATE



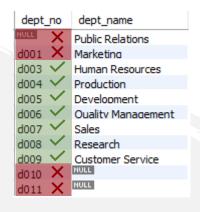
#### departments\_dup

dept\_no CHAR(4)
dept\_name VARCHAR(40)



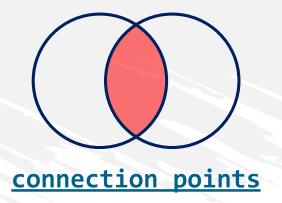
emp_no	dept_no	from_date	to_date
999904	NULL X	2017-01-01	NULL
999905	NULL X	2017-01-01	NULL
999906	NULL X	2017-01-01	NULL
999907	NULL X	2017-01-01	NULL
110085	d002 ×	1985-01-01	1989-12-17
110114	d002 X	1989-12-17	9999-01-01
110183	d003 ✓	1985-01-01	1992-03-21
110228	d003 ✓	1992-03-21	9999-01-01
110303	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
111692	d009 🗸	1985-01-01	1988-10-17
111784	d009 🗸	1988-10-17	1992-09-08
111877	d009 🗸	1992-09-08	1996-01-03
111939	d009 ✓	1996-01-03	9999-01-01

dept_no	emp_no	dept_name
d003	110228	Human Resources
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d009	111692	Customer Service
d009	111877	Customer Service



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dept\_no CHAR(4)
emp\_no INT
from\_date DATE
to\_date DATE



#### departments\_dup

dept\_no CHAR(4)
dept\_name VARCHAR(40)



WHERE (the Old Join Syntax)

```
SELECT

t1.column_name, t1.column_name, ..., t2.column_name, ...

FROM

table_1 t1,

table_2 t2

WHERE

t1.column_name = t2.column_name;
```

JOIN or WHERE?

JOIN or WHERE?

- the retrieved output is identical

- JOIN or WHERE?
- the retrieved output is identical
- using <a href="https://www.when.com/w

### JOIN or WHERE?

- the retrieved output is identical
- using <u>WHERE</u> is more time-consuming
- the <u>WHERE</u> syntax is perceived as *morally old* and is rarely employed by professionals

### JOIN or WHERE?

- the retrieved output is identical
- using <u>WHERE</u> is more time-consuming
- the <u>WHERE</u> syntax is perceived as *morally old* and is rarely employed by professionals
- the <u>JOIN</u> syntax allows you to modify the connection between tables easily

JOIN (the New Join Syntax) vs WHERE (the Old Join Syntax)