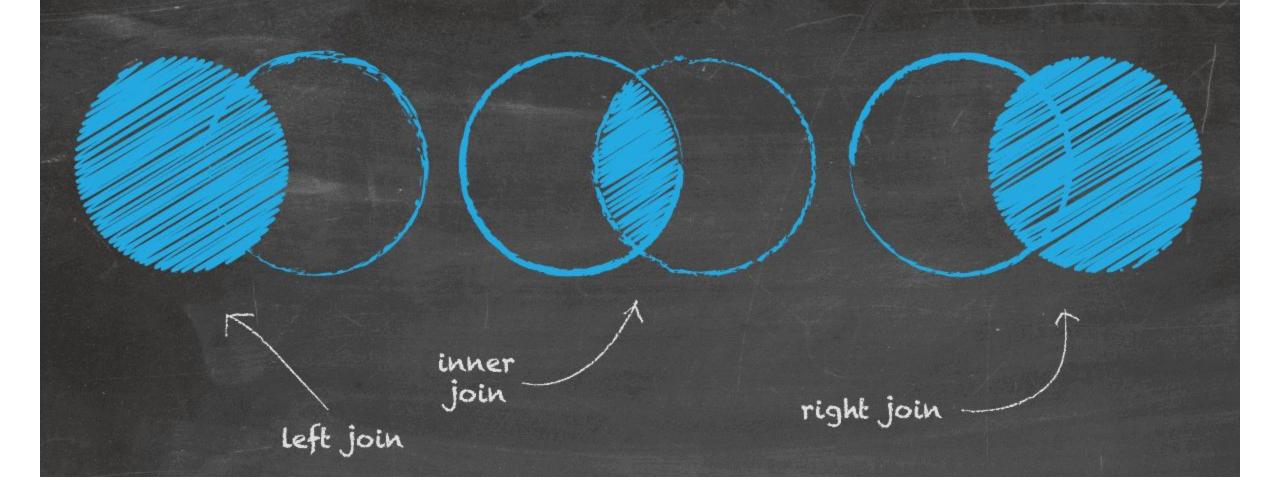
# Understanding SQL Joins



# Joins:

- The SQL way to express relations between data in tables
- Form a new row in the result set, from matching rows in each joined table
- As fundamental to using a relational database as a loop is in other programming languages

# ZCUSTOMERS

id	name	city	tel
1	John	New York	111111
2	Peter	London	222222
3	David	Singapore	432555
4	Micheal	Bangkok	234111

# **ZSALEREPS**

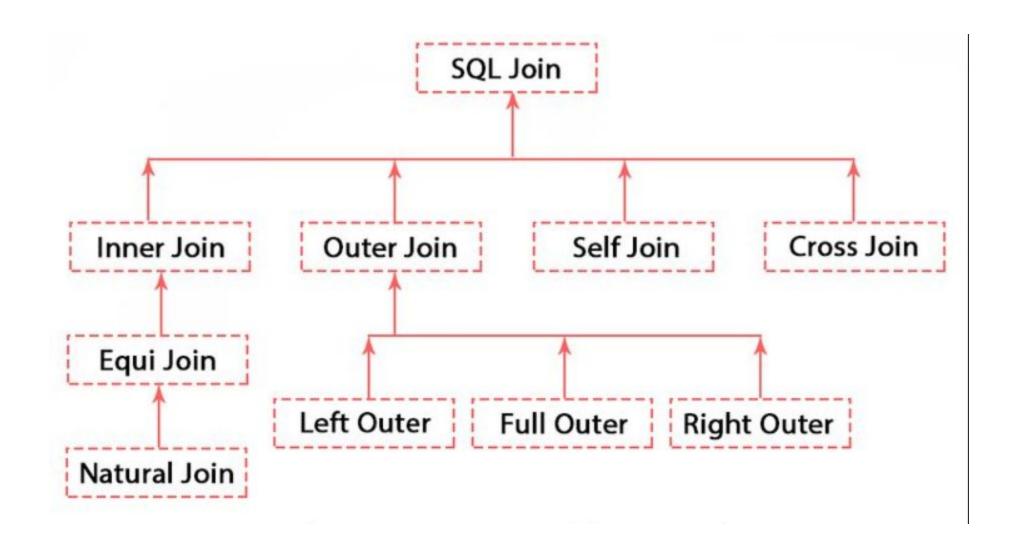
sale_id	name
01	Somchai
02	Pipop

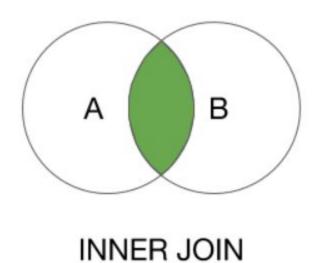
## **ZSALES**

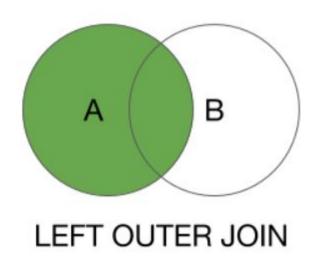
# **ZPRODUCTS**

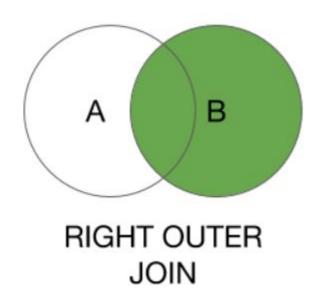
p_id	prod_name	on_hand
A1	Pen	100
A2 <	Pencii	125
B1	Ruler	80
X1	Таре	120
Y1	CD	99

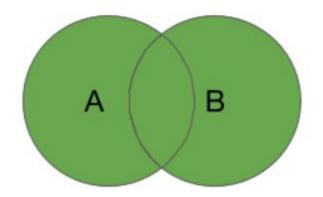
cust_id	prod_id	sale_date	qty	sale_id
1	A1	20020318	10	01
1	A2	20020318	50	01
3	X1	20020321	90	02



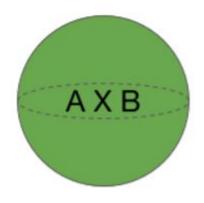












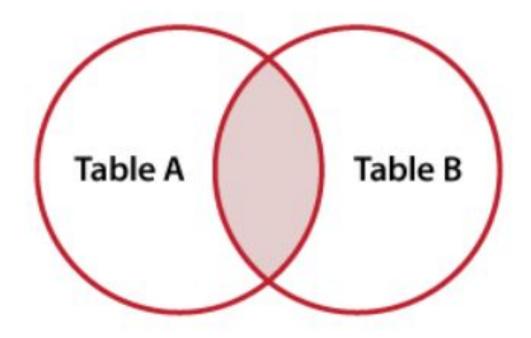
CARTESIAN (CROSS) JOIN

## Employees table

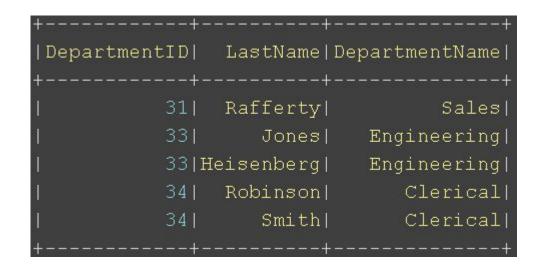
A. 81	1.
LastName Dep	partmentID
+	+
Rafferty	31
Jones	33
Heisenberg	33
Robinson	34
Smith	34
Williams	null
+	+

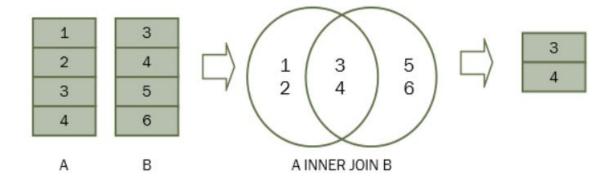
#### Department table

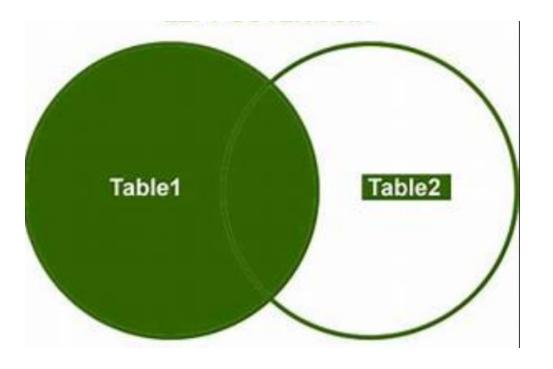
# **INNER JOIN**

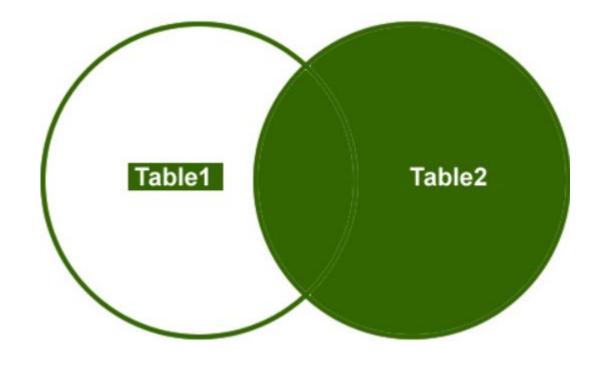


SELECT \* FROM employee
INNER JOIN department
ON employee.DepartmentID = department.DepartmentID;











# Questions????





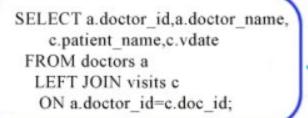


With an inner join, we are:  matching information between two or more tables. selecting non-correlated information from two tables. selecting information inside one table.
With an inner join, clients without salesperson are displayed:  True.  False.  It depends.
Can you join 3 tables together with inner join:  Yes.  No.

SELECT \* FROM employee LEFT JOIN department ON employee.DepartmentID = department.DepartmentID;

++-  DepartmentID  +	 LastName [ 	DepartmentName	1	3		1
, , , , , , , , , , , , , , , , , , , ,	   Rafferty	Sales	2	4		2
] 33]	Jones	Engineering	3	5	$\neg$ $(2 (4) 6) \neg$	3
33 Н	eisenberg	Engineering	4	6		4
] 34	Robinson	Clerical				
] 34[	Smith	Clerical	Α	В	A LEFT JOIN B	
null	Williams	null				
i i						

### Why Would You Use Left Join



doctors

visits

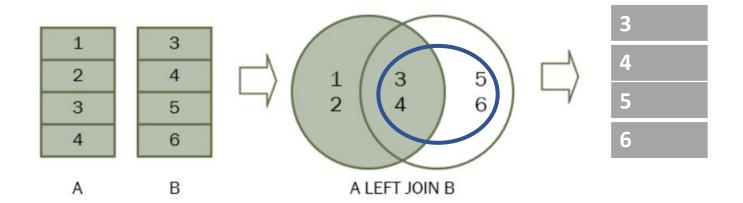
doctor_id	doctor_name	doctor id	patient_name	vdate
		210	Julia Nayer	2013-10-15
210	Dr. John Linga	214	TJ Olson	2013-10-14
211	Dr. Peter Hall	215	John Seo	2013-10-15
212	Dr. Ke Gee			
213	Dr. Pat Fay	212	James Marlow	2013-10-16
210	Dr. rac ray	212	Jason Mallin	2013-10-12

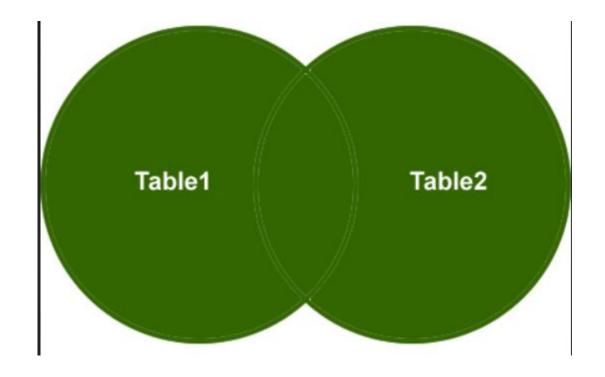


doctor_id	doctor_name	patient_name	vdate
210	Dr. John Linga	Julia Nayer	2013-10-15
211	Dr. Peter Hall		
212	Dr. Ke Gee	James Marlow	2013-10-16
212	Dr. Ke Gee	Jason Mallin	
213	Dr. Pat Fay		

SELECT \* FROM employee LEFT JOIN department ON employee.DepartmentID = department.DepartmentID;

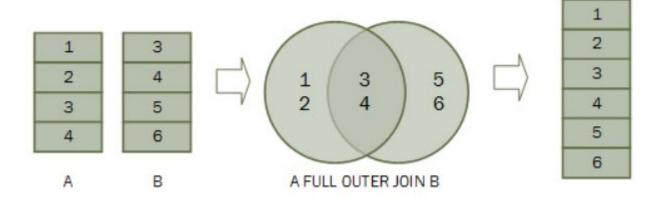
> SELECT \* FROM employee RIGHT JOIN department ON employee.DepartmentID = department.DepartmentID;

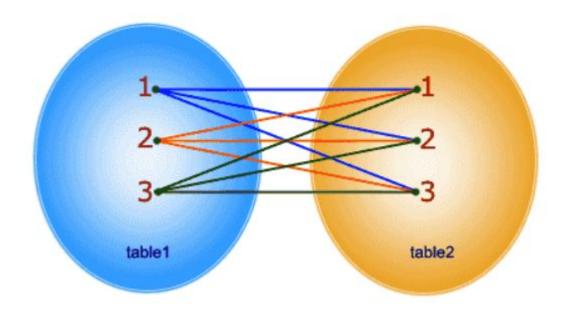




SELECT \* FROM employee LEFT JOIN department ON employee.DepartmentID = department.DepartmentID;

> SELECT \* FROM employee FULL JOIN department ON employee.DepartmentID = department.DepartmentID;





# Why Would You Use Full Join

ook_id	title		borrow_id			returned
50	Around an Empty Grave	2	5	54	2012-03-01	
29	Suggestions for the Amelioration of Sick-Bays	2	6	23	2012-03-01	2912-83-8
32	The Reckaning of the Years	2		39	2012-03-01	2012-03-0
26	Mariners: Consensus and Cohesion in Certain States of Adversity		9	26	2012-03-01	2012-03-0
23	De Vermis Mysteriis	2	18	41	2012-03-01	2012-03-0
56	The Dark Forces: A Guide to Self-Protection	2	11	3	2012-03-01	
33	The Rural Juror	1	12	25	2012-03-01	
2	Where God Went Wrong	4	13	42	2012-03-01	
56	The Dark Forces: A Guide to Self-Protection	2	14	29	2012-03-02	2012-03-0
22	Unaussprechlichen Kulten	2	15	45	2012-03-02	
18	The Butlerian Jihad	4	16	28	2012-03-02	
21	The Horn of Joy	2	17	17	2012-03-02	
58	Around an Empty Grave	2	18	55	2012-03-02	
25	Seven Cryptical Books of Hsan	5	19	44	2012-03-02	
11	Giant Hat of Sumatra	2	20	32	2012-03-02	
30	The Theory and Practice of Oligarchical Collectivism	2	21	26	2012-03-02	
1	Necronomican	1	22	35	2012-03-02	
33	The Rural Juror	1	23		2012-03-03	
43	The Garden of Forking Paths	2	24	12	2012-03-03	
18	The Butlerian Jihad	4	25	43	2012-03-03	
39	Statements	2	26	23	2012-03-03	
38	The Secret Mirror	2	27	39	2012-03-04	
57	Hamster Huey and the Gooey Kablooie	1	28	7	2012-03-04	
43	The Garden of Forking Paths	2	29	52	2012-03-05	
21	The Horn of Joy	2	30	23	2012-03-05	
44	Outside the Town of Malbork	2	31	13	2012-03-05	
39	Statements	2	32	28	2012-03-05	
54	The Dismissed	2	33	49	2012-03-05	
36	The King in Yellow	2	34	48	2012-03-05	
11	Giant Rat of Sumatra	2	35	37	2012-03-05	
19	The Story of Liet-Kynes	4	36	2	2012-03-05	
57	Hamster Huey and the Gooey Kablooie	1	37	48	2012-03-05	
30	The Theory and Practice of Oligarchical Collectivism	2	38	26	2012-03-05	
8 1	History of a Land called Ugbar	2	39	29	2012-03-06	
	Tetragrammaton	2	40	44	2012-03-07	
45	Leaning from the Steep Slope	2	41	52	2012-03-07	
15	Of Tattoo Marks	2	42	17	2012-03-07	
27		2	43	55	2012-03-07	
34	Urban Fervor		44	2	2012-03-07	
48	In a Network of Lines that Intersect	2	45	20	2012-03-07	
1	Necronomicon		46	11	2012-03-07	
40	April March		47	48	2012-03-07	The second second

#### All columns of both tables are displayed together

book_id   title	format	borrow_id	patron_id	borrowed	retur
50   Around an Empty Grave   29   Suggestions for the Amelioration of Sick-Bays   32   The Reckoning of the Years   26   Mariners: Consensus and Cohesion in Certain States of Adversity	2 2 1 2	5   6   8	23	2012-03-01     2012-03-01     2012-03-01     2012-03-01	2012- 2012-

#### Where there is not overlapping, a NULL is displayed. Easy to identify

	45   Leaning from the Steep Slope	2	41	52	2012-03-07	2012-03-07
İ	15   Of Tattoo Marks	2	42	17	2012-03-07	2012-03-07
İ	27   New Operations for Suprapubic Cystotomy	2	43	55	2012-03-07	2012-03-07
I	34   Urban Fervor	1 1	44	2 /	2012-03-07	2012-03-07
1	48   In a Network of Lines that Intersect	2	45	20	2012-03-07	2012-03-07
1	1   Necronomicon	1 1	46	11 /	2012-03-07	NULL
1	40   April March	2	47	48 /	2012-03-07	NULL
+	+	++		//	t/	t+

## Examples using our in class library:

- To see if a title has circulated recently
- To see what patrons have borrowed
- To see if any items have not been returned

# SELECT \* FROM employee CROSS JOIN department;

+	+	+	+
LastName	   DepartmentID	DepartmentID	DepartmentName
+	++	+	+
Rafferty	31	31	Sales
Rafferty	31	33	Engineering
Rafferty	31	34	Clerical
Rafferty	31	35	Marketing
Jones	33	31	Sales
Jones	33	33	Engineering
Jones	33	34	Clerical
Jones	33	35	Marketing
Heisenberg	33	31	Sales
Heisenberg	33	33	Engineering
+	+	+	+
only showing	g top 10 rows		

# TABLE A TABLE B A B C



# Questions????







# SELECT COUNT(\*) FROM Sales.Invoices as inv JOIN Sales.Orders as ord on inv.OrderID = ord.OrderID;

1. What does this query count? \*

Select one

#### Select one

Rows in Sales.Invoices that have a matching row in Sales.Orders based on the OrderID

Rows in Sales.Invoices, whether or not they have a matching row in Sales.Orders based on OrderID

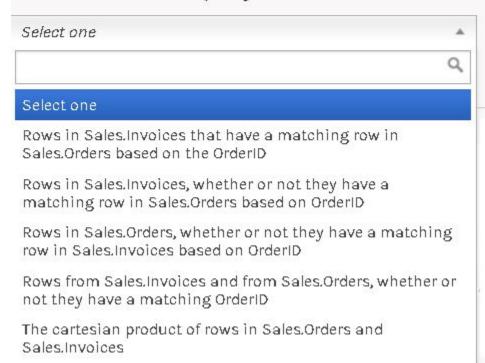
Rows in Sales.Orders, whether or not they have a matching row in Sales.Invoices based on OrderID

Rows from Sales.Invoices and from Sales.Orders, whether or not they have a matching OrderID

The cartesian product of rows in Sales.Orders and Sales.Invoices

# SELECT COUNT\_BIG(\*) FROM Sales.Invoices as inv CROSS JOIN Sales.Orders as ord;

#### 5. What does this query count? \*



# **Tables**

Color

Red

Blue

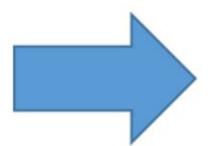


Small

Medium

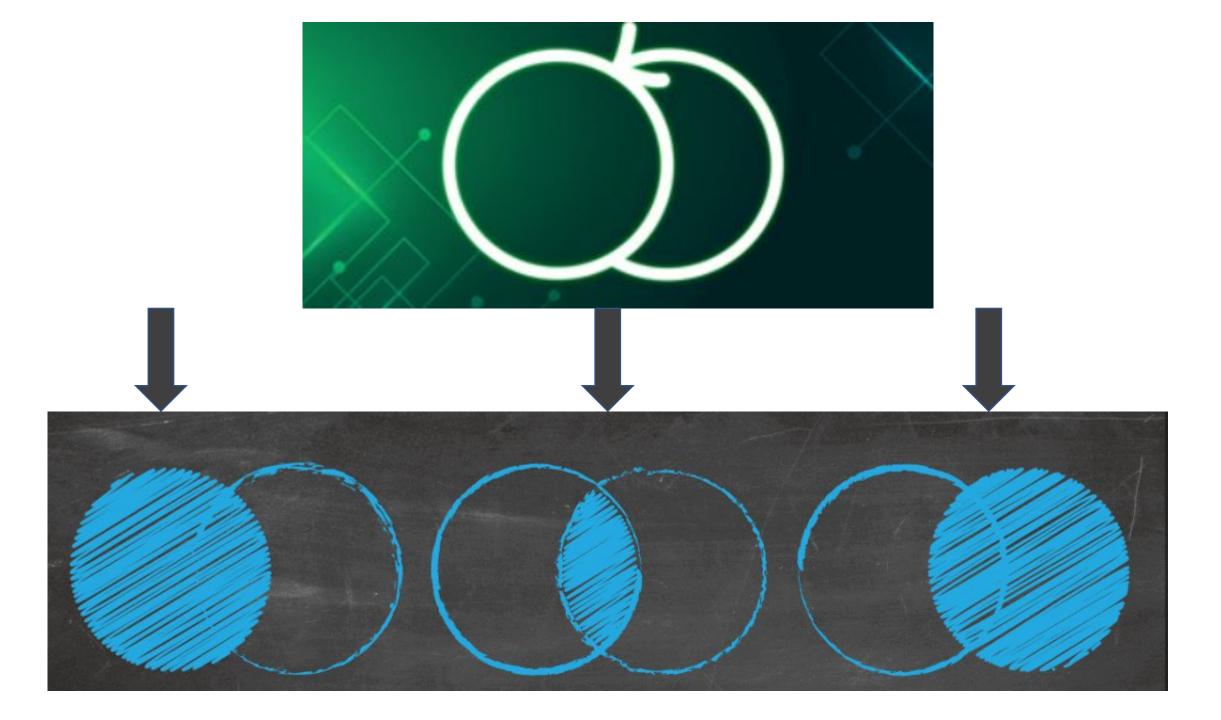
Large

Extra Large



# **Query Result**

Color	Size
Red	Small
Blue	Small
Red	Medium
Blue	Medium
Red	Large
Blue	Large
Red	Extra Large
Blue	Extra Large



#### employees

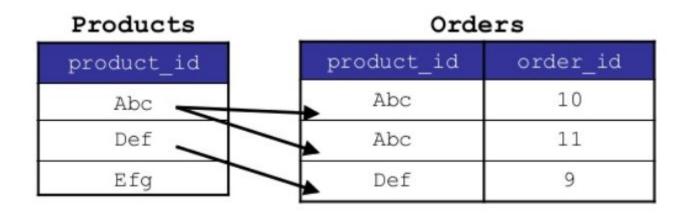
\* employeeNumber lastName firstName extension email officeCode reportsTo jobTitle

Manager	Direct report
Bondur, Gerard	Jones, Barry
Bondur, Gerard	Bott, Larry
Bondur, Gerard	Castillo, Pamela
Bondur, Gerard	Hernandez, Gerard
Bondur, Gerard	Bondur, Loui
Bondur, Gerard	Gerard, Martin
Bow, Anthony	Tseng, Foon Yue
Bow, Anthony	Patterson, Steve
Bow, Anthony	Firrelli, Julie
Bow, Anthony	Thompson, Leslie
Bow, Anthony	Jennings, Leslie
Bow, Anthony	Vanauf, George

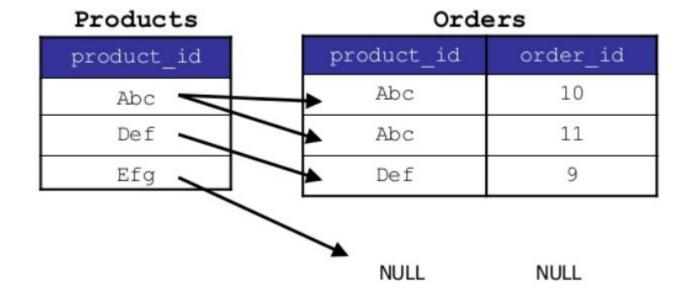
# \* employees \* employeeNumber lastName firstName extension email officeCode reportsTo jobTitle

Manager	Direct report	
Top Manager	Murphy, Diane	
Patterson, William	King, Tom	
Patterson, William	Marsh, Peter	
Patterson, William	Fixter, Andy	
Patterson, Mary	Bondur, Gerard	
Patterson, Mary	Nishi, Mami	
Patterson, Mary	Patterson, William	
Patterson, Mary	Bow, Anthony	
Nishi, Mami	Kato, Yoshimi	
Murphy, Diane	Firrelli, Jeff	
Murphy, Diane	Patterson, Mary	

#### What is the difference between a Inner and Outer join



Inner join



Outer join



# Questions????

