Joins

Monday, February 20, 2017

Agenda

- Announcements
- Reading Quiz
- Joins Discussion
- 4 Practice Problems!

Announcements

- Lab 2: grades and comments will be released by end of week
- Next week: Lab 3
- Lab 3 Setup Guide will be out this weekend

Q1: A query's result table is a virtual table.

a) True

Q2: A query can have at most one join.

a) True

Q3: A join on two tables requires their column names to be identical.

a) True

Q4: Which is not a valid join type?

a) Inner join

b) Outer join

c) Self join

d) Group join

e) Cross join

Q5: Joins are expensive operations, especially when run over large tables.

a) True

- Inner join:
 - Includes the records only when there is a match
- Left outer join:
 - Includes the left record(s) even when there is no match
- Right outer join:
 - Includes the right record(s) even when there is no match
- Full outer join:
 - Includes both the left and right records even when there is no match

- Inner joins:
 Includes only the matching records
- Outer joins:
 - a) Left outer joins:
 - Includes the left record(s) even when there is no match
 - b) Right outer join:
 - Includes the right record(s) even when there is no match
 - c) Full outer join:
 - Includes both left and right records even when there is no match

<u>empid</u>	firstname	lastname	depid
1	Michael	Dell	5
2	Betty	Jennings	
3	Bill	Gates	5
4	Fran	Bilas	8

Employee

depidname5Executive6Operations7Sales8Product

Department

FROM Employee e INNER JOIN Department d					
ON e.depid = d.depid;					
empid firstname lastname name					

1	Michael	Dell	Executive
3	Bill	Gates	Executive
4	Fran	Bilas	Product
(3 rows))		

- Inner joins:
 Includes only the matching records
- Outer joins:
 - a) Left outer joins:
 - Includes the left record(s) even when there is no match
 - b) Right outer join:
 - Includes the right record(s) even when there is no match
 - c) Full outer join:
 - Includes both left and right records even when there is no match

<u>empid</u>	firstname	lastname	depid
1	Michael	Dell	5
2	Betty	Jennings	
3	Bill	Gates	5
4	Fran	Bilas	8

Employee

<u>depid</u>	name
5	Executive
6	Operations
7	Sales
8	Product

Department

SELECT e.empid, e.	firstname, e.	lastname, d.name	
FROM Employee e LE	FT OUTER JOIN	Department d	
ON e.depid = d.depid;			

empid	firstname	lastname	name
1	Michael	Dell	Executive
2	Betty	Jennings	
3	Bill	Gates	Executive
4	Fran	Bilas	Product
(4 rows))		

- Inner joins:
 -Includes only the matching records
- Outer joins:
 - a) Left outer joins:
 - Includes the left record(s) even when there is no match
 - b) Right outer join:
 - Includes the right record(s) even when there is no match
 - c) Full outer join:
 - Includes both left and right records even when there is no match

name

<u>empid</u>	firstname	lastname	depid
1	Michael	Dell	5
2	Betty	Jennings	
3	Bill	Gates	5
4	Fran	Bilas	8

5Executive6Operations7Sales8Product

depid

Employee

SELECT e.empid,	e.firstname,	e.lastnar	me, d.name	
FROM Employee e	RIGHT OUTER	JOIN Depar	rtment d	
ON e.depid = d.depid;				
empid fi	rstname lastname	name		

cubra l	1 ±1 ö en anic	1 Tao chaine	l Hame
+		+	+
1	Michael	Dell	Executive
3	Bill	Gates	Executive
4	Fran	Bilas	Product
			Operations
			Sales
(5 rows))		

- Inner joins:
 Includes only the matching records
- Outer joins:

a) Left outer joins:

- Includes the left record(s) even when there is no match

b) Right outer join:

- Includes the right record(s) even when there is no match

c) Full outer join:

- Includes both left and right records even when there is no match

<u>empid</u>	firstname	lastname	depid
1	Michael	Dell	5
2	Betty	Jennings	
3	Bill	Gates	5
4	Fran	Bilas	8

Employee

<u>depid</u>	name
5	Executive
6	Operations
7	Sales
8	Product

Department

SELECT e.empid, e.firstname, e.lastname, d.name						
FROM Employee e FULL OUTER JOIN Department d						
ON e.depid = d.depid;						

empid	firstname	lastname	name
+ 1 2 3 4 (6 rows)	Michael Betty Bill Fran	Dell Jennings Gates Bilas	Executive Executive Product Operations Sales

Practice Problem 1: Find all concerts playing in Austin or Houston or Dallas during the month of March

Notes:

- Use catgroup = 'Concerts'
- Use month = 'MAR'
- Return eventname, catname, venuecity, venuename, calcdate, starttime
- Sort results by calcdate, eventname, venuecity



Practice Problem 1: Find all concerts playing in Austin or Houston or Dallas during the month of March

Have many joins are needed to compute the answer?

a) 3

b) 2

c) 1

d) 0



Practice Problem 2: Find all users in the database who have not bought any tickets

Notes:

- Return userid, firstname, lastname, email, city, state
- Sort by userid



Practice Problem 2: Find all users in the database who have not bought any tickets

What kind of join is required to compute the answer?

- a) Inner join
- b) Outer join
- c) Self join
- d) No join



Practice Problem 3: Find all categories that are not associated with any events and all events that are missing a category

Notes:

- Return catid, catname, eventid, eventname
- Sort by catid, eventid



Practice Problem 3: Find all categories that are not associated with any events and all events that are missing a category

How many nulls are in the query?

a) 0

b) 1

d) 3

c)



2



Self Joins

- Inner joins:
 Includes only the matching records in the same table
 - Outer joins:
 - a) Left outer joins:
 - Includes the left record(s) even when there is no match
 - b) Right outer join:
 - Includes the right record(s) even when there is no match
 - c) Full outer join:
 - Includes both left and right records even when there is no match

SELEC	CT e.empid	l, e.firs	tname,	e.last	name, e.m	nngid, n	n.empid,	m.firstname,	m.lastname
FROM Employee e INNER JOIN Employee m									
ON e.	mngid = m	.empid;							
empid	firstname	lastname	mngid	empid	firstname	lastnam	e		
		+	+	•	+	+			
2	Betty	Jennings	1	1	Michael	Dell			
3	Bill	Gates	2	2	Betty	Jenning	s		
4	Fran	Bilas	1	1	Michael	Dell			
(3 rows))								

<u>empid</u>	firstname	lastname	mngid
1	Michael	Dell	
2	Betty	Jennings	1
3	Bill	Gates	2
4	Fran	Bilas	1

Employee

Self Joins

- Inner joins:
 Includes only the matching records in the same table
 - Outer joins:
 - a) Left outer joins:
 - Includes the left record(s) even when there is no match
 - b) Right outer join:
 - Includes the right record(s) even when there is no match
 - c) Full outer join:
 - Includes both left and right records even when there is no match

	SELE FROM ON e	CT e.empi Employee .mngid =	id, e.firs e e LEFT (m.empid;	stname, DUTER (, e.las JOIN En	stname, e nployee r	e.mngid, m	m.empid,	m.firstname,	m.lastname
ĺ	empid	firstname	lastname	mngid	empid	firstname	e lastname	2		
	1 2 3 4 4 rows	Michael Betty Bill Fran)	Dell Jennings Gates Bilas	1 2 1	1 2 1	 Michael Betty Michael	 Dell Jennings Dell	5		

<u>empid</u>	firstname	lastname	mngid
1	Michael	Dell	
2	Betty	Jennings	1
3	Bill	Gates	2
4	Fran	Bilas	1

Employee

Practice Problem 4: Find all events that took place in the same venue and on the same day as a 'Spoon' show

Notes:

- Use eventname = 'Spoon'
- Return eventid, eventname, venueid, dateid, startime



Practice Problem 4: Find all events that took place in the same venue and on the same day as a 'Spoon' show

Which columns are used in the join condition of this query?

a) dateid, venueid

- b) eventid
- c) eventid, dateid
- d) eventid, dateid, venueid



Practice Problem Solutions

Tickit dataset, DDL, copy commands and queries for practice problems: <u>https://github.com/cs327e-spring2017/snippets</u> (look for filenames tickit_*)