CS 327E Class 3

Feb 10, 2020

1) Which is not a valid join type?

A. Self Join
B. Left Outer Join
C. Left Inner Join
D. Inner Join

2) Which type of join does the following query contain?

```
SELECT id, name, role
FROM Person p
FULL JOIN Cast_Crew c
on p.id = c.person;
```

A. Inner Join
B. Outer Join
C. Neither one

Person

id	name	age
1	Robert De Niro	76
2	Martin Scorsece	77
3	Greta Gerwig	36
4	Scarlett Johansson	35

Movie

id	title	year
a	The Irishman	2019
b	Jojo Rabbit	2019
c	Marriage Story	2019
d	Little Women	2019

Cast_Crew

person	movie	role
4	c	Actor
4	b	Actor
2	a	Director
1	a	Actor

3) Which type of join does the following query contain?

```
SELECT *
FROM Person, Movie;
```

A. Inner Join
B. Natural Join
C. Cross Join
D. None of the above

Person

id	name	age
1	Robert De Niro	76
2	Martin Scorsece	77
3	Greta Gerwig	36
4	Scarlett Johansson	35

Movie

id	title	year
a	The Irishman	2019
b	Jojo Rabbit	2019
c	Marriage Story	2019
d	Little Women	2019

Cast_Crew

person	movie	role
4	c	Actor
4	b	Actor
2	a	Director
1	a	Actor

4) The following queries are equivalent.

```
SELECT id, name, role
FROM Person p
LEFT JOIN Cast_Crew c
on p.id = c.person;
```

```
SELECT id, name, role
FROM Cast_Crew c
RIGHT JOIN Person p
on p.id = c.person;
```

A. True
B. False

Person

id	name	age
1	Robert De Niro	76
2	Martin Scorsece	77
3	Greta Gerwig	36
4	Scarlett Johansson	35

Movie

id	title	year
a	The Irishman	2019
b	Jojo Rabbit	2019
c	Marriage Story	2019
d	Little Women	2019

Cast_Crew

person	movie	role
4	c	Actor
4	b	Actor
2	a	Director
1	a	Actor

5) The following query produces ___ records.

```
SELECT *
FROM Person p1
JOIN Person p2
ON p1.id = p2.id;
```

A. 1
B. 2
C. 3
D. 4

Person

id	name	age
1	Robert De Niro	76
2	Martin Scorsece	77
3	Greta Gerwig	36
4	Scarlett Johansson	35

Movie

id	title	year
a	The Irishman	2019
b	Jojo Rabbit	2019
c	Marriage Story	2019
d	Little Women	2019

Cast_Crew

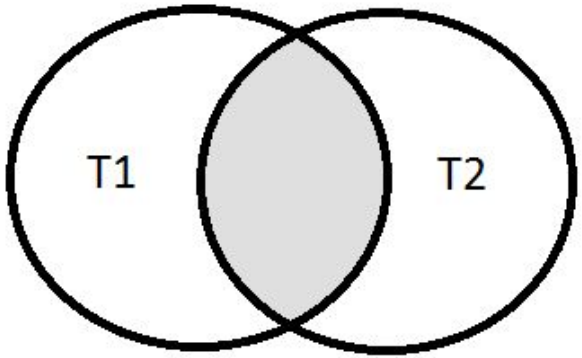
person	movie	role
4	c	Actor
4	b	Actor
2	a	Director
1	a	Actor

Syntax of Join Queries

```
SELECT <list of desired fields>
FROM <single table T1>
JOIN <single table T2> ON <T1.c1 = T2.c1>
WHERE <boolean conditions>
ORDER BY <list of fields to sort on>
```

Inner Join

```
SELECT *
FROM T1
[INNER] JOIN T2 ON T1.c1 = T2.c1
```



Inner Join

```
SELECT *
FROM T1
[INNER] JOIN T2 ON T1.c1 = T2.c1
[INNER] JOIN T3 ON T2.c2 = T3.c2
```

Inner Join

```
SELECT *
FROM T1
[INNER] JOIN T2 ON T1.c1 = T2.c1 AND T1.c2 = T2.c2
[INNER] JOIN T3 ON T2.c2 = T3.c2
```

Inner Join

Employee

empid	emp_name	emp_dep
2	Mike	1
23	Dave	2
3	Sarah	
5	Jim	4
6	Sunil	1
37	Morgan	4

Department

depid	dep_name
1	Sales
2	Product
3	Research
4	Engineering
5	HR

```
SELECT emp_name, dep_name
FROM Employee JOIN Department ON emp_dep = depid;
```

Result Table

emp_name	dep_name
Mike	Sales
Dave	Product
Jim	Engineering
Sunil	Sales
Morgan	Engineering

First Question

What are first names, last names, and grades of students who take CS329E with Prof. Mitra?

Current_Students(sid, fname, lname, dob, cno, cname, credits, grade)

New_Students(sid, fname, lname, dob)

Classes(tid, instructor, dept, cno, cname, credits)

iClicker Question

What are first names, last names, and grades of students who take CS329E with Prof. Mitra?

How many records are in the answer?

A. 1
B. 2
C. 3

Second Question

Who are the students who take both CS327E and CS329E?

Current_Students(sid, fname, lname, dob, cno, cname, credits, grade)

New_Students(sid, fname, lname, dob)

Classes(tid, instructor, dept, cno, cname, credits)

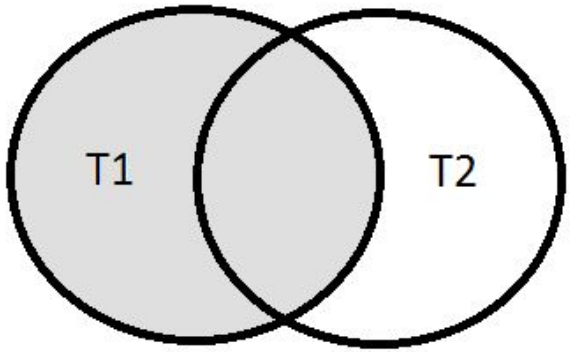
Second Question

Who are the students who take both CS327E and CS329E?

```
SELECT sid
FROM Current_Students
JOIN Current_Students on sid = sid
WHERE cno = 'CS327E'
AND cno = 'CS329E'
```

Left Outer Join

```
SELECT *
FROM T1 LEFT [OUTER] JOIN T2
ON T1.c1 = T2.c1
```



Left Outer Join

Employee

empid	emp_name	emp_dep
2	Mike	1
23	Dave	2
3	Sarah	
5	Jim	4
6	Sunil	1
37	Morgan	4

Department

depid	dep_name
1	Sales
2	Product
3	Research
4	Engineering
5	HR

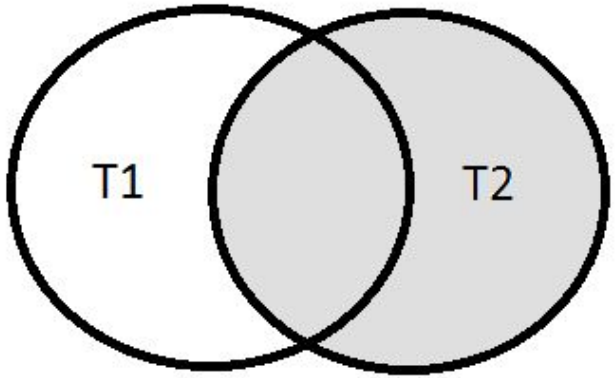
```
SELECT emp_name, dep_name
FROM Employee LEFT JOIN Department ON emp_dep = depid
ORDER BY emp_name;
```

Result Table

emp_name	dep_name
Dave	Product
Jim	Engineering
Mike	Sales
Morgan	Engineering
Sarah	
Sunil	Sales

Right Outer Join

```
SELECT *
FROM T1 RIGHT [OUTER] JOIN T2
ON T1.c1 = T2.c1
```



Right Outer Join

Employee

empid	emp_name	emp_dep
2	Mike	1
23	Dave	2
3	Sarah	
5	Jim	4
6	Sunil	1
37	Morgan	4

Department

depid	dep_name
1	Sales
2	Product
3	Research
4	Engineering
5	HR

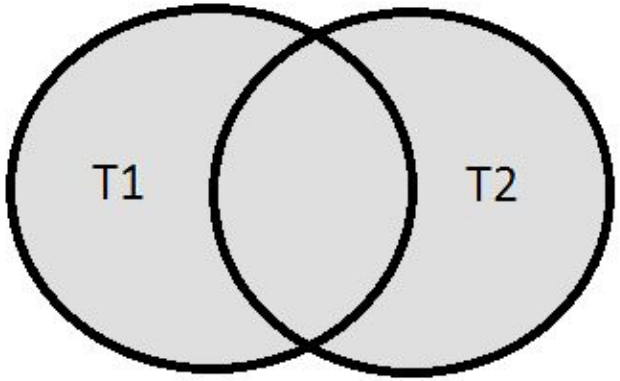
```
SELECT emp_name, dep_name
FROM Employee RIGHT JOIN Department ON emp_dep = depid
ORDER BY dep_name, emp_name;
```

Result Table

emp_name	dep_name
Jim	Engineering
Morgan	Engineering
	HR
Dave	Product
	Research
Mike	Sales
Sunil	Sales

Full Outer Join

```
SELECT *
FROM T1 FULL [OUTER] JOIN T2
ON T1.c1 = T2.c1
```



Full Outer Join

Employee

empid	emp_name	emp_dep
2	Mike	1
23	Dave	2
3	Sarah	
5	Jim	4
6	Sunil	1
37	Morgan	4

Department

depid	dep_name
1	Sales
2	Product
3	Research
4	Engineering
5	HR

```
SELECT emp_name, dep_name
FROM Employee FULL JOIN Department ON emp_dep = depic
ORDER BY dep_name, emp_name;
```

Result Table

emp_name	dep_name
Jim	Engineering
Morgan	Engineering
	HR
Dave	Product
	Research
Mike	Sales
Sunil	Sales
Sarah	

Third Question

Which instructors have no students in their class?

Current_Students(sid, fname, lname, dob, cno, cname, credits, grade)

New_Students(sid, fname, lname, dob)

Classes(tid, instructor, dept, cno, cname, credits)

iClicker Question

Which instructors have no students in their class?

What type of join does this query require?

A. Self join
B. Outer join
C. Inner join

Demo: Creating an ERD

1. Sign up for Lucidchart
2. Draw staging tables and their fields
3. Discover relationships and keys
4. Draw relationships and keys

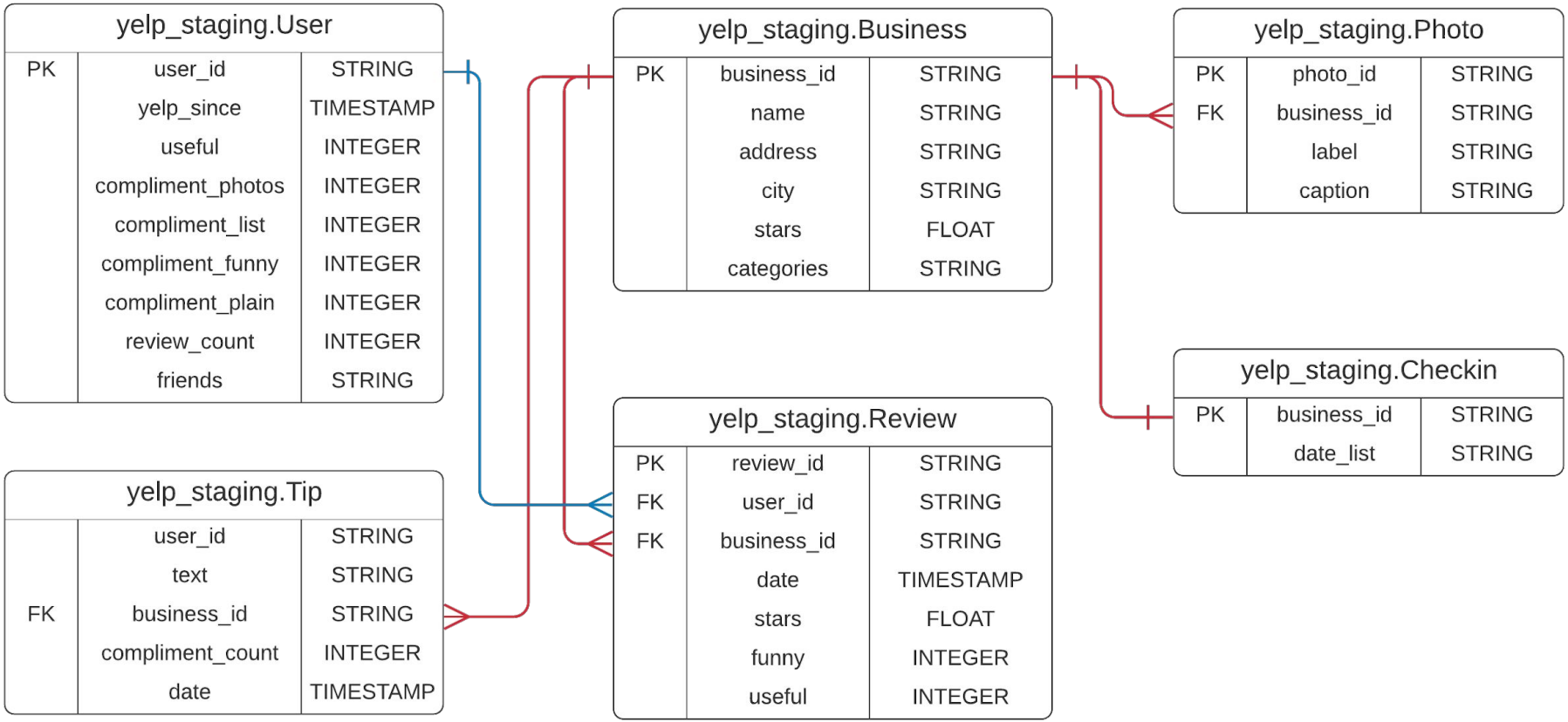
College Staging ERD

college_staging.Classes		
	tid	String
	instructor	String
	dept	String
	cno	String
	cname	String
	credits	Integer

college_staging.Current_Students		
	sid	String
	fname	String
	lname	String
	dob	String
	cno	String
	cname	String
	credits	Integer
	grade	String

college_staging.New_Students		
PK	sid	String
	fname	String
	lname	String
	dob	Date

Yelp Staging ERD



Fourth Question

Which classes are taught by two teachers?

Show the answer as the cno of the class and tid for both teachers.

Current_Student(sid, fname, lname, dob, cno, cname, credits, grade)

New_Student(sid, fname, lname, dob)

Class(tid, instructor, dept, cno, cname, credits)

iClicker Question

Which classes are taught by two teachers?

Show the answer as the cno of the class and tid for both teachers.

How many records does the answer have?

A. 4
B. 3
C. 2
D. 1

Milestone 3

http://www.cs.utexas.edu/~scohen/milestones/Milestone3.pdf