

CS 327E Class 7

October 21, 2019

Announcements

- Midterm is **next class** from 6pm - 7:30pm
- Midterm location: Mary E Gearing Hall, **GEA 105**
- Review session: Friday from 1pm - 2pm in GDC 1.304
- Milestone 7 due this Friday.

1) Which is not an aggregate function?

- A. SUM()
- B. COUNT(*)
- C. AVG()
- D. MIN()
- E. None of the above

2) Consider the `Women_Soccer_2019` table shown below. What is the output from Q1 when run on this table?

```
Q1: SELECT COUNT(*) FROM Women_Soccer_2019
     WHERE position IN ('M', 'D')
```

`Women_Soccer_2019`

<code>player_id</code>	<code>player_name</code>	<code>height</code>	<code>position</code>	<code>goals</code>
1	Cameron Brooks	5-9	OB	1
5	Carlee Allen	5-9	M	1
20	Atu Mshana	5-4	D	0
21	Kailey Smith	5-5	M	1
7	Julia Grosso	5-8	M	7

- A. 0
- B. 9
- C. 7
- D. 4
- E. 3

3) Consider the `Women_Soccer_2019` table shown below. What is the output from Q2 when run on this table?

```
Q2: SELECT MIN(goals) FROM Women_Soccer_2019
     WHERE position IN ('M', 'D')
```

`Women_Soccer_2019`

<code>player_id</code>	<code>player_name</code>	<code>height</code>	<code>position</code>	<code>goals</code>
1	Cameron Brooks	5-9	OB	1
5	Carlee Allen	5-9	M	1
20	Atu Mshana	5-4	D	0
21	Kailey Smith	5-5	M	1
7	Julia Grosso	5-8	M	7

- A. 0
- B. 9
- C. 7
- D. 3
- E. 1

4) Consider the `Women_Soccer_2019` table shown below. What is the output from Q3 when run on this table?

```
Q3: SELECT MAX(goals) FROM Women_Soccer_2019
     WHERE height = '5-9'
```

`Women_Soccer_2019`

<code>player_id</code>	<code>player_name</code>	<code>height</code>	<code>position</code>	<code>goals</code>
1	Cameron Brooks	5-9	OB	1
5	Carlee Allen	5-9	M	1
20	Atu Mshana	5-4	D	0
21	Kailey Smith	5-5	M	1
7	Julia Grosso	5-8	M	7

- A. 10
- B. 9
- C. 7
- D. 3
- E. 1

5) Consider the `Women_Soccer_2019` table shown below. What is the output from Q4 when run on this table?

```
Q4: SELECT SUM(goals) FROM Women_Soccer_2019
      WHERE position = 'M' OR position = 'D'
```

`Women_Soccer_2019`

<code>player_id</code>	<code>player_name</code>	<code>height</code>	<code>position</code>	<code>goals</code>
1	Cameron Brooks	5-9	OB	1
5	Carlee Allen	5-9	M	1
20	Atu Mshana	5-4	D	0
21	Kailey Smith	5-5	M	1
7	Julia Grosso	5-8	M	7

- A. 10
- B. 9
- C. 7
- D. 3
- E. 1

Syntax of Global Aggregate Queries

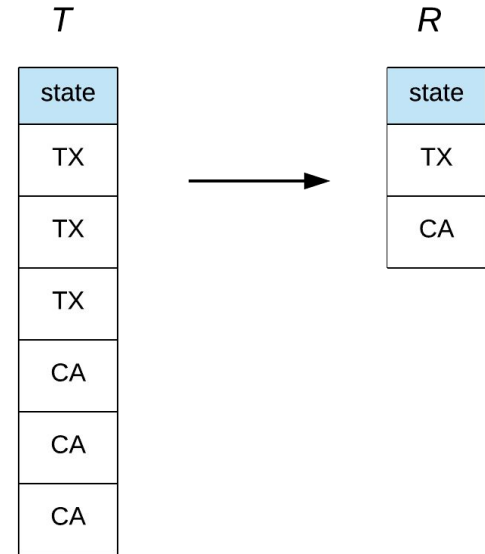
```
SELECT <aggregate functions>  
FROM <single table>  
JOIN <single table> ON <join condition>  
WHERE <boolean condition>
```


Syntax of Aggregate Queries with Groups

```
SELECT <unaggregated fields>  
FROM <single table>
```

...

```
GROUP BY <unaggregated fields>
```



Syntax of Aggregate Queries with Groups

```
SELECT <unaggregated fields>, <aggregate functions>  
FROM <single table>  
JOIN <single table> ON <join condition>  
WHERE <boolean condition>  
GROUP BY <unaggregated fields>  
HAVING <boolean condition>  
ORDER BY <fields to sort on>
```

How COUNT () works

1) `SELECT COUNT (*)
FROM Employee`

2) `SELECT COUNT (emp_dept)
FROM Employee`

3) `SELECT COUNT (DISTINCT emp_dept)
FROM Employee`

Employee

Row	empid	emp_name	emp_dept
1	6	Sunil	1
2	2	Mike	1
3	23	Dave	2
4	5	Jim	4
5	37	Morgan	4
6	3	Sarah	<i>null</i>

First Question

How many students are taking each class?

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

Second Question

For each class with at least two students in it, how many students are taking such a class?

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

iClicker Question

For each class with at least two students in it, how many students are taking such a class?

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

Does this query require a HAVING clause?

- A. Yes
- B. No

Third Question

For each student who is at least 19-years old and is earning more than 2 class credits, how many total class credits are such students earning?

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

iClicker Question

For each student who is 19-years old or above and is earning at least 3 class credits, how many total class credits are such students earning?

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

Does this query require a WHERE clause?

A. Yes B. No

Fourth Question

Who takes exactly 3 classes?

Show the answer as a sorted list of sids.

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

iClicker Question

Who takes exactly 3 classes?

Show the answer as a sorted list of sids.

Student(sid, fname, lname, dob)

Class(cno, cname, credits)

Teacher(tid, fname, lname, dept)

Takes(sid, cno, grade)

Teaches(tid, cno)

Does this query contain an aggregate function in the `SELECT` clause?

A. Yes B. No

Database Views

- Defined by `CREATE VIEW` statement
- Return a table of results from a SQL query
- Saved in the database as named query

```
Employee(empid, fname, lname, role, level, start_date, curr_salary, dob, ssn, emergency_contact)
```

```
CREATE VIEW Director_View AS  
  SELECT empid, fname, lname, role, level, start_date, curr_salary  
  FROM Employee  
  WHERE level != 'Executive'  
  ORDER BY empid
```

```
SELECT empid, fname, lname  
FROM Director_View  
WHERE start_date > '2018-04-23'  
AND role = 'Data Engineer'
```

Example Views

```
CREATE VIEW Director_View AS
  SELECT empid, fname, lname, role, level, start_date, curr_salary
  FROM Employee
  WHERE level != 'Executive'
  ORDER BY empid
```

```
SELECT empid, fname, lname
FROM Director_View
WHERE start_date > '2018-04-23'
AND role = 'Data Engineer'
```

```
CREATE VIEW Manager_View AS
  SELECT empid, fname, lname, role, level, start_date, curr_salary
  FROM Director_View
  WHERE level != 'Director'
  ORDER BY empid
```

```
SELECT empid, fname, lname
FROM Manager_View
WHERE curr_salary > 200000
AND level = 'Director'
```

Demo: Views and Data Studio

- Create Views in BigQuery
- Query Views in BigQuery
- Create Data Sources in Data Studio
- Create Report and Charts in Data Studio

Referenced code: https://github.com/cs327e-fall2019/snippets/blob/master/create_views.sql

Milestone 7

<http://www.cs.utexas.edu/~scohen/milestones/Milestone7.pdf>