Aggregation Lecture 7 Section 5.1.7 - 5.1.8

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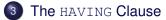
Wed, Jan 29, 2014

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Aggregate Functions

2 Grouping

3 The HAVING Clause

Assignment

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• MySQL supports five aggregate functions.

- COUNT()
- SUM()
- AVG()
- MAX()
- MIN()

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Aggregate Functions

<pre>SELECT COUNT(*), SUM(salary), AVG(salary), MIN(salary), MAX(salary) FROM employees; ++</pre>				
COUNT(*) SUM(salary	7) AVG(salary)	MIN(salary)	MAX(salary)	
	00 49583.333333	25000.00	100000.00	

- Each function applies to the tuples in the table produced by the SELECT query.
- The functions SUM(), AVG(), MAX(), and MIN() must be applied to specific attributes.

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Aggregate Functions

<pre>SELECT COUNT(*), SUM(salary), AVG(salary), MIN(salary), MAX(salary) FROM employees WHERE dept = 2; ++</pre>				
+++	AVG(salary)	MIN(salary)	MAX(salary)	
	53000.000000	35000.00	80000.00	

- Each function applies to the tuples in the table produced by the SELECT query.
- The functions SUM(), AVG(), MAX(), and MIN() must be applied to specific attributes.

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4 Assignment

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The GROUP BY Clause

SELECT select_attribute_list FROM table_name WHERE condition GROUP BY group_attribute_list

• We can use the GROUP BY clause to group the tuples according to one or more attributes.

Group by Sex					
<pre>SELECT sex, COUNT(*), MIN(bdate), MAX(bdate) FROM employees GROUP BY sex; ++</pre>					
sex	COUNT(*)	MIN(bdate)	MAX(bdate)		
F	6 6	1959-03-31 1955-03-17	++ 1985-12-02 1986-06-12 ++		

- For example, we can group the employees by their sex.
- In such queries, we should also select the group-by attributes, but we should not select any attributes that vary within groups.

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Group by Sex and Department				
<pre>SELECT dept, sex, COUNT(*), MIN(bdate), MAX(bdate) FROM employees GROUP BY dept, sex;</pre>				
++	·	L	++	
dept sex	COUNT(*)	MIN(bdate)	MAX(bdate)	
			++	
1 M	1	1974-02-15	1974-02-15	
2 F	2	1968-05-22	1985-12-02	
2 M	3	1966-11-24	1986-06-12	
3 F	4	1959-03-31	1985-10-12	
3 M	2	1955-03-17	1966-08-21	
+++	+	+	++	

- We can group by more than one attribute.
- This will create subgroups within groups.

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Outline

Aggregate Functions

2 Grouping



4 Assignment

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The HAVING Clause

SELECT select_attribute_list FROM table_name WHERE tuple_condition GROUP BY group_attribute_list HAVING group_condition

- The HAVING clause is the same as the WHERE clause, except that it applies to groups, not tuples.
- The WHERE clause applies only to tuples.

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Average Salary by Department

```
SELECT dept, AVG(salary)
FROM employees
GROUP BY dept
HAVING AVG(salary) >= 50000;
+----+
| dept | AVG(salary) |
+----+
| 1 | 100000.000000 |
| 2 | 53000.000000 |
+----+
```

• Find all departments with an average salary of at least \$50,000.

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Average Salary by Department

```
SELECT dept, AVG(salary)
FROM employees
WHERE salary >= 50000
GROUP BY dept
HAVING AVG(salary) >= 50000;
+----+
| dept | AVG(salary)
+----+
   1 | 100000.000000 |
 2 | 63333.333333 |
    3 | 70000.000000
   ---+----+
```

• How does this example differ from the previous example?

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The HAVING Clause

Group by Social Security Number

```
SELECT fname, lname, COUNT(*)
FROM employees AS e, dependents AS d
WHERE e.ssn = d.ssn
GROUP BY e.ssn
HAVING COUNT (*) >= 2
ORDER BY lname;
+----+
fname | lname | COUNT(*) |
----+
| Frank | Gilbert | 2 |
                   2. 1
| James | Green |
 Jennifer | Wallace | 3 |
          _____
```

 Find all employees who have at least 2 dependants, ordered by last name.

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Outline

- Aggregate Functions
- 2 Grouping
- 3 The HAVING Clause



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- Find all female employees who have at least 2 dependants.
- Find all employees who have no dependants.
- Display the average number of children among the employees.

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Outline

- Aggregate Functions
- 2 Grouping
- 3 The HAVING Clause

Assignment

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Assignment

• Read Sections 5.1.7 - 5.1.8.

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