

## CS122 Using Relational Databases and SQL Aggregations

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## Aggregation Functions

- ◆ Returns a single results based on multiple rows
  - COUNT
  - SUM
  - AVG
  - MIN, MAX
  - FIRST, LAST

## Aggregation Function Examples

- ◆ Number of movies released by SONY
- ◆ Total weekend grosses of the movies released by SONY
- ◆ Average weekend grosses of the movies released by SONY
- ◆ The movie released by SONY with the highest (lowest) weekend gross

## Aggregation Queries

location	quarter	month	console	sales
MP	1	1	PS2	23
MP	1	2	Xbox	10
AH	1	2	PS2	50
AH	2	6	Xbox	37

- ◆ How many consoles are sold in the first quarter at each store location?
- ◆ How many consoles are sold in the Alhambra store each quarter?
- ◆ What's the annual sales of each console?

## GROUP BY

- ◆ The number of movies released by each distributor

```
SELECT dist, count(title) FROM Box_office GROUP BY dist;
```

## GROUP BY Multiple Columns

location	quarter	month	console	sales
MP	1	1	PS2	23
MP	1	2	Xbox	10
AH	1	2	PS2	50
AH	2	6	Xbox	37

```
SELECT location, sum(sales) FROM Sales_report GROUP BY location;
```

```
SELECT location, quarter, sum(sales) FROM Sales_report  
GROUP BY location, quarter;
```

```
SELECT location, quarter, sum(sales) FROM Sales_report  
GROUP BY location, quarter;
```

```
SELECT location, quarter, month, sum(sales) FROM Sales_report  
GROUP BY location, quarter;
```

## Observations About GROUP BY

- ◆ Aggregate on distinct value(s) of the group-by attribute(s)
- ◆ Group-by attribute(s) must be the same as the non-aggregate attributes in the SELECT clause

## HAVING

- ◆ The number of movies released by each distributor. Only list those who released at least 2 movies.

```
SELECT dist, count(title) FROM Box_office
GROUP BY dist
HAVING count(title) >= 2;
```

## Conditional vs. Final Filter

- ◆ HAVING – final filter
- ◆ WHERE – conditional filter

```
SELECT class, COUNT(*) FROM Student
GROUP BY class
HAVING class=3;
```

```
SELECT class, COUNT(*) FROM Student
WHERE class=3
GROUP BY class;
```