



Cube Operation

- The **cube** operation computes union of **group by**'s on every subset of the specified attributes
- E.g. consider the query

```
select item_name, color, size, sum(number)  
from sales  
group by cube(item_name, color, size)
```

This computes the union of eight different groupings of the *sales* relation:

```
{ (item_name, color, size), (item_name, color),  
  (item_name, size),      (color, size),  
  (item_name),          (color),  
  (size),              ( ) }
```

where () denotes an empty **group by** list.

- For each grouping, the result contains the null value for attributes not present in the grouping.