Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

# Module 2
# SQL Subtotal Operators

## Lesson 4: GROUPING SETS Operator

# Lesson Objectives

- Write SQL SELECT statements using the GROUPING SETS operator
- Convert CUBE and ROLLUP operations into GROUPING SETS operations
- Reflect on importance of the GROUPING SETS operator



# GROUPING SETS Operator {}

## Flexibility

- Any set of subtotals
- Normal GROUP BY result not default

## Explicit specification

- Provide set of column combinations
- Similar to UNION query



# GROUPING SETS Example I

- Summarize sum of store sales for USA and Canada in 2016 by store zip and month
- Generate full subtotals by store zip and month

```
SELECT StoreZip, TimeMonth,
       SUM(SalesDollar) AS SumSales
 FROM SSSales, SSStore, SSTimeDim
 WHERE SSSales.StoreId = SSStore.StoreId
   AND SSSales.TimeNo = SSTimeDim.TimeNo
   AND (StoreNation = 'USA' OR StoreNation = 'Canada')
   AND TimeYear = 2016
 GROUP BY GROUPING SETS((StoreZip, TimeMonth), StoreZip,
   TimeMonth, ())
 ORDER BY StoreZip, TimeMonth;
```



# GROUPING SETS Example II

- Summarize sum of store sales for USA and Canada in 2016 by store zip and month
- Generate subtotals for store zip, month and grand total without the combination for store zip and month

```
SELECT StoreZip, TimeMonth,
       SUM(SalesDollar) AS SumSales
 FROM SSSales, SSStore, SSTimeDim
 WHERE SSSales.StoreId = SSStore.StoreId
   AND SSSales.TimeNo = SSTimeDim.TimeNo
   AND (StoreNation = 'USA' OR StoreNation = 'Canada')
   AND TimeYear = 2016
 GROUP BY GROUPING SETS(StoreZip, TimeMonth, ())
 ORDER BY StoreZip, TimeMonth;
```



# ROLLUP/GROUPING SETS Comparison

Examples 3 and 4

```
SELECT TimeYear, TimeMonth, SUM(SalesDollar) …
GROUP BY ROLLUP(TimeYear, TimeMonth)

SELECT TimeYear, TimeMonth, SUM(SalesDollar) …
GROUP BY GROUPING SETS ((TimeYear, TimeMonth), TimeYear,
   ());
```

Examples 5 and 6

```
SELECT TimeYear, TimeMonth, TimeDay, SUM(SalesDollar) …
GROUP BY ROLLUP(TimeYear, TimeMonth, TimeDay)

SELECT TimeYear, TimeMonth, TimeDay, SUM(SalesDollar) …
GROUP BY GROUPING SETS ((TimeYear, TimeMonth, TimeDay),
   (TimeYear, TimeMonth), TimeYear, ());
```



# CUBE/GROUPING SETS Comparison

Example 7 and 8

```
SELECT StoreZip, TimeMonth, SUM(SalesDollar) …
GROUP BY CUBE(StoreZip, TimeMonth);

SELECT StoreZip, TimeMonth, SUM(SalesDollar) …
GROUP BY GROUPING SETS ((StoreZip, TimeMonth), StoreZip,
   TimeMonth,());
-- (StoreZip, TimeMonth): normal GROUP BY result
```

Example 9 and 10

```
SELECT StoreZip, TimeMonth, DivId, SUM(SalesDollar) …
GROUP BY CUBE(StoreZip, TimeMonth, DivId);

SELECT StoreZip, TimeMonth, DivId, SUM(SalesDollar) …
GROUP BY GROUPING SETS ((StoreZip,TimeMonth,DivId),
   (StoreZip,TimeMonth), (StoreZip,DivId),
   (TimeMonth,DivId), StoreZip, TimeMonth, DivId,());
-- (StoreZip,TimeMonth,DivId): normal GROUP BY result
```



# Summary

- Precise control of subtotals
- Explicit specification of column combinations including most detailed level
- Useful to understand subtotals generated by CUBE and ROLLUP operators