Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Module 3
Oracle SQL Analytic Functions

Lesson 1: Processing Model and Basic Syntax

Lesson Objectives

- Understand processing extension for analytic functions
- Write SELECT statements using basic syntax elements (OVER and ORDER BY)
- Reflect on the motivation for analytic function extensions

Business Intelligence Analysis

- **Top and worst performers**
- **Trends**
- **Quantitative contributions**

- **SELECT statement extensions**
  - **Difficult to write**
- **Poor productivity**
- **Poor performance**

Analytic Function versus Aggregate Function

- **Aggregate Function**
  - **Computes one value**
  - **Reduces group to a single row**
  - **Calculated before analytic functions**
- **Analytic Function**
  - **Computes multiple values**
  - **Preserves number of rows in a group**
  - **Calculated after aggregate functions**

Analytic Function Processing

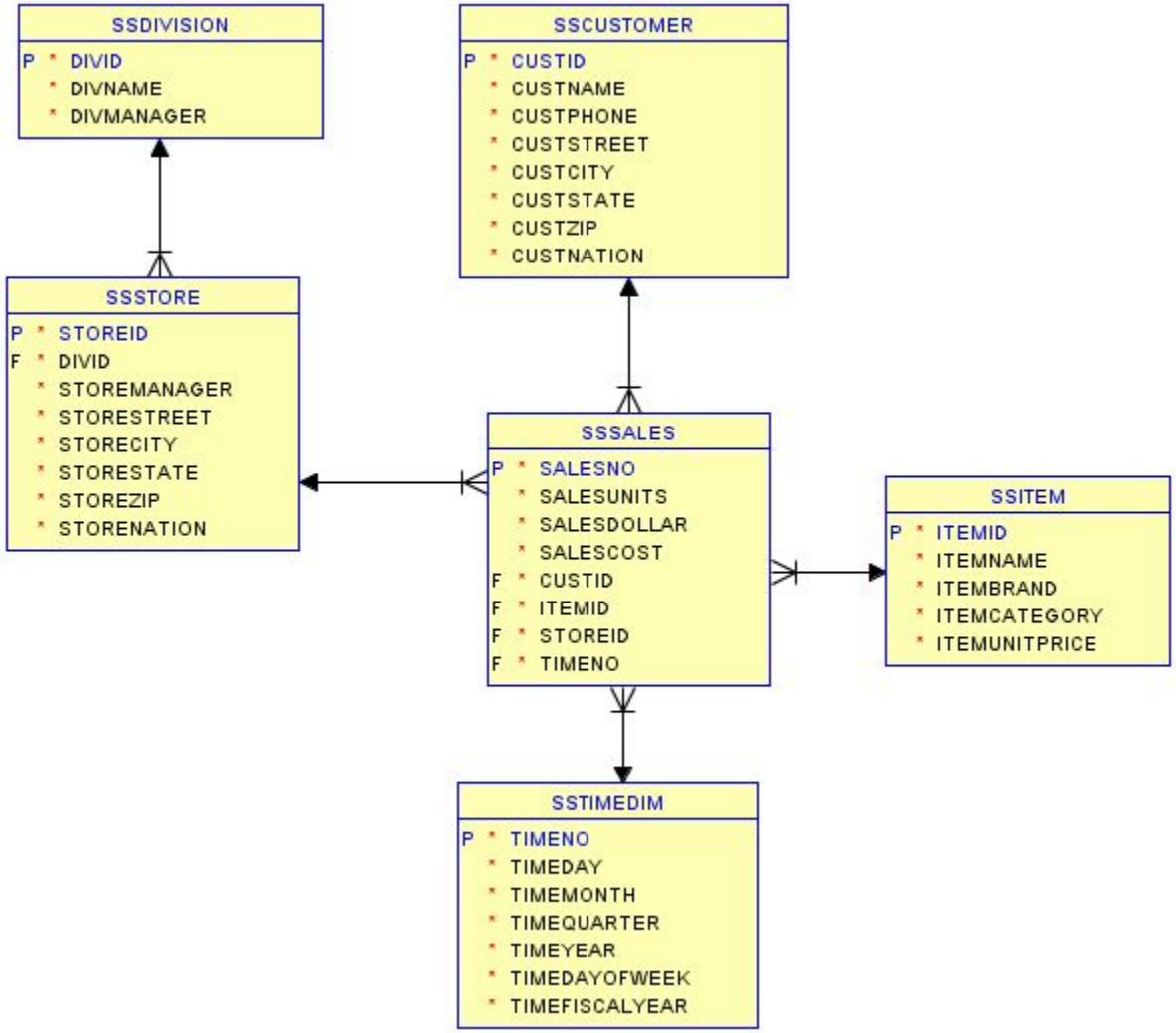
- **Rows**
  - **FROM**
  - **WHERE**
- **Groups**
  - **GROUP BY**
  - **HAVING**
- **Analytic**
  - **Create partitions**
  - **Evaluate functions**
  - **Order partitions**
- **Result**
  - **ORDER BY**
  - **SELECT**

Basic Syntax Elements

- `<AnalyticFunction> ([<column-list>]) OVER ( [ORDER BY <ordering>] )`
  - Place in SELECT clause list
  - OVER clause identifies window (set of rows)
  - Ordering criteria for function evaluation
- Examples

```
RANK() OVER
  (ORDER BY ItemPrice) AS RankUnitPrice
RANK() OVER
  (ORDER BY SUM(SalesDollar) ) AS RankSales
```


Oracle Diagram for the Store Sales Tables



Rank Example I

- Rank items by ascending item price

```
SELECT ItemId, ItemBrand, ItemUnitPrice,
  RANK() OVER ( ORDER BY ItemUnitPrice ) AS RankUnitPrice
  FROM SSItem;

ITEMID   ITEMBRAND          ITEMUNITPRICE RANKUNITPRICE
-------- ------------------ ------------- -------------
I1412138 Ethlite                       12             1
I1445671 Intersafe                  14.99             2
I6677900 Connex                     25.69             3
…
```


Rank Example II

- Rank customers by descending sum of dollar sales
- Group on customer name

```
SELECT CustName, SUM(SalesDollar) AS SumSales,
 RANK() OVER (ORDER BY SUM(SalesDollar) DESC) SalesRank
 FROM SSSales, SSCustomer
 WHERE SSSales.CustId = SSCustomer.CustId
 GROUP BY CustName;

CUSTNAME                         SUMSALES  SALESRANK
------------------------------ ---------- ----------
Sheri Gordon                       556322          1
Wally Jones                         94004          2
Jim Glussman                        91100          3
Candy Kendall                       90664          4
…
```


Additional Problems

- Write SELECT statements
- Example 3
  - Rank item brands descending by average dollar sales in 2014 and 2015
  - Show item brand, average dollar sales, and rank
- Example 4
  - Rank item brands by average dollar sales in 2014 and 2015
  - Only include brands with more than 10 sales in 2014 and 2015
  - Show item brand, number of sales (COUNT), average dollar sales, and rank
- Solutions in a module 3 document

Summary

- Use analytic functions to answer common business intelligence questions
- Analytic functions computed after grouping
- OVER and ORDER BY keywords