



Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Module 3

SQL Analytic Functions

Lesson 1: Processing Model and Basic Syntax



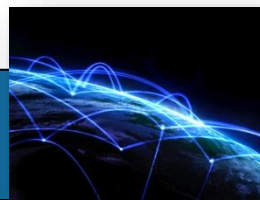
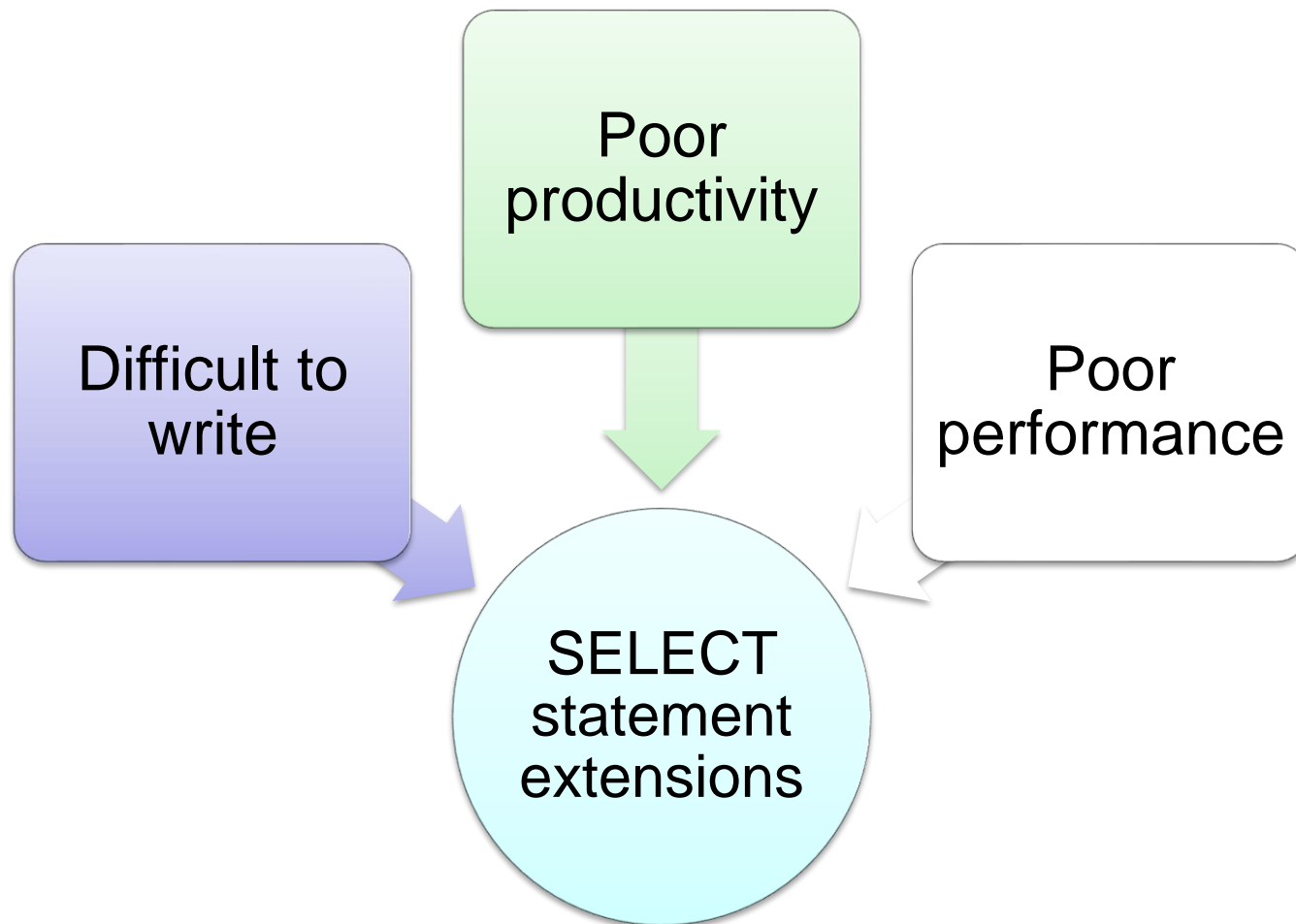
Lesson Objectives

- 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

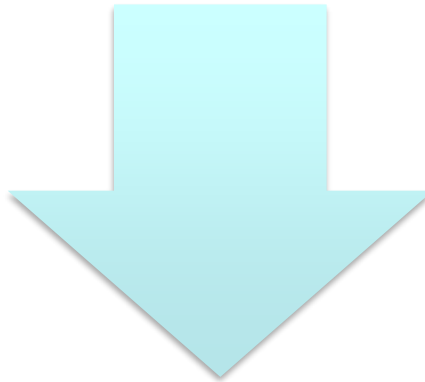


Business Intelligence Analysis





Analytic Function versus Aggregate Function



Aggregate Function

- Computes one value
- Reduces group to a single row
- Calculated before analytic functions

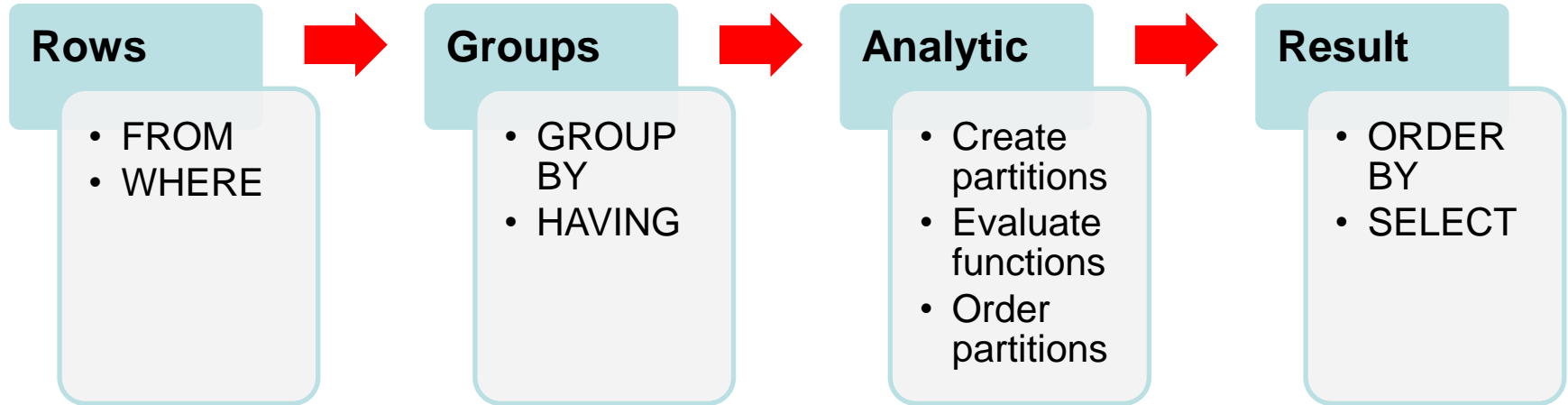


Analytic Function

- Computes multiple values
- Preserves number of rows in a group
- Calculated after aggregate functions



Analytic Function Processing



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

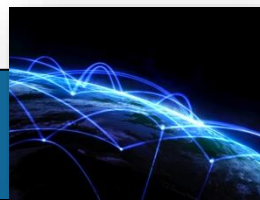
- **Examples**

```
RANK () OVER
```

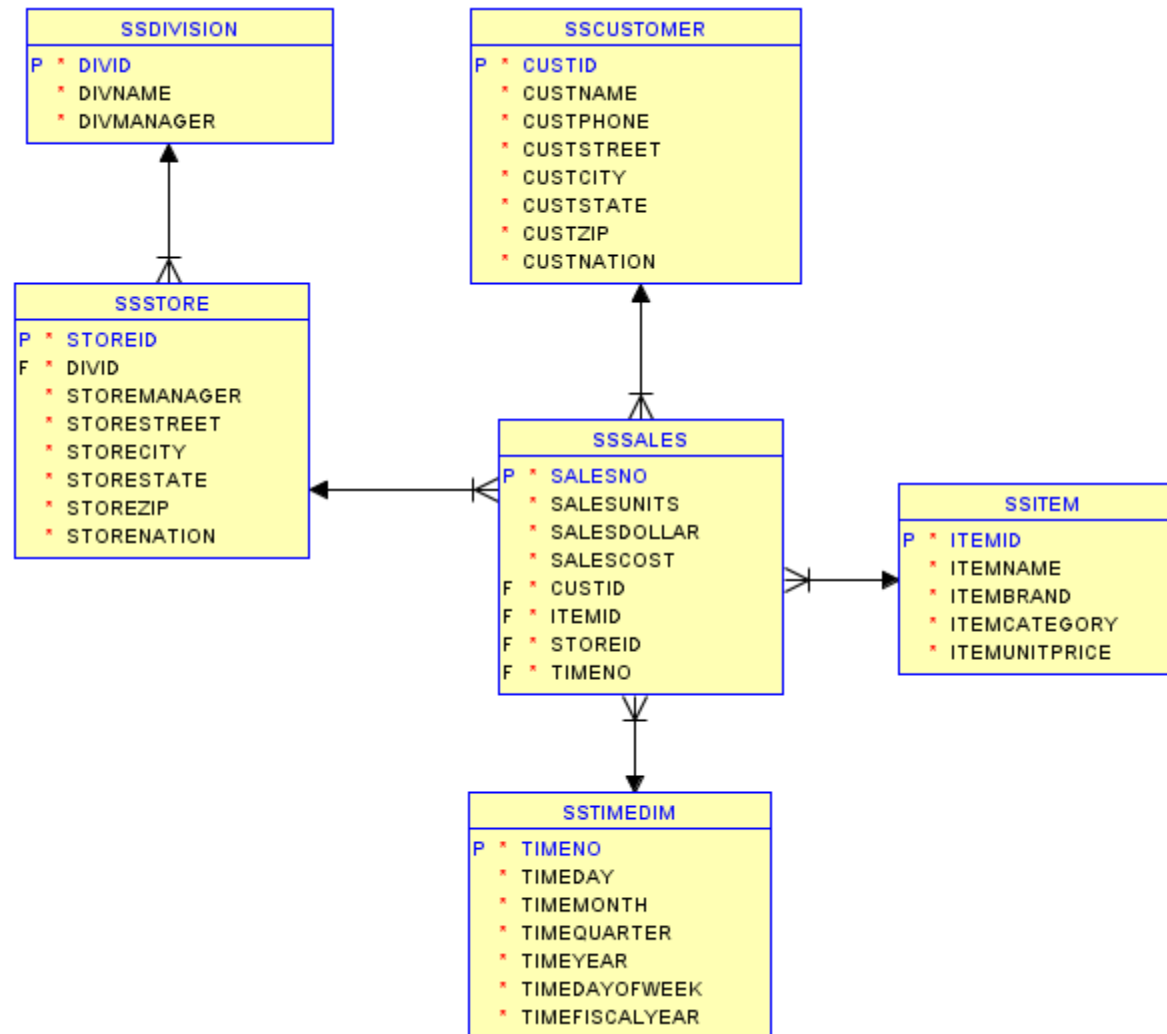
```
(ORDER BY ItemPrice) AS RankUnitPrice
```

```
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 2020 and 2021
 - Show item brand, average dollar sales, and rank
- Example 4
 - Rank item brands by average dollar sales in 2020 and 2021
 - Only include brands with more than 10 sales in 2020 and 2021
 - 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

