PROCESSING MULTIPLE TABLES

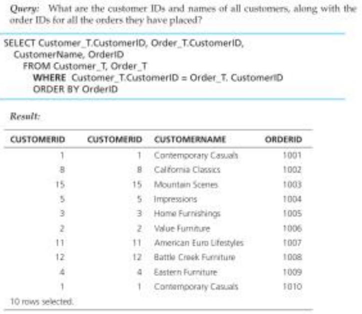
The power of RDBMSs is realized when working with multiple tables. When relationships exist among tables, the tables can be linked together in queries. Remember from Chapter 4 that these relationships are established by including a common column(s) in each table where a relationship is needed.

- This is achieved by primary-foreign key relationship.
- You can use these columns to establish a link between two tables by finding common values in the columns.

In SQL, the WHERE clause of the SELECT command is also used for multiple-table operations.

- The most frequently used relational operation, which brings together data from two or more related tables into one resultant table, is called a **join**
  - In either case, two tables may be joined when each contains a column that shares a common domain with the other.
  - As mentioned previously, a primary key from one table and a foreign key that references the table with the primary key will share a common domain and are frequently used to establish a join.
  - In special cases, joins will be established using columns that share a common domain but not the primary key–foreign key relationship, and that also works (e.g., you might join customers and salespersons based on common postal codes, for which there is no relationship in the data model for the database).
  - The result of a join operation is a single table.
  - No matter what form of join you are using, there should be one ON or WHERE specification for each pair of tables being joined.
    - Thus, if two tables are to be combined, one ON or WHERE condition would be necessary, but if three tables (A, B, and C) are to be combined, then two ON or WHERE conditions would be necessary since you would have A-B and B-C pairs

Types of joins

- Equi-Join: With an equi-join, the joining condition is based on equality between values in the common columns.
  - For example, if you want to know data about customers who have placed orders, you will find that information in two tables, Customer_T and Order_T.
    - 

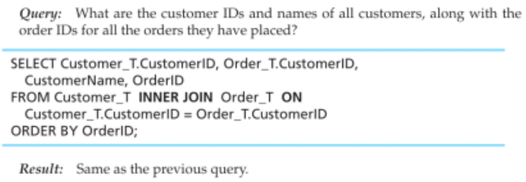
      Query: What are the customer IDs and names of all customers, along with the order IDs for all the orders they have placed?

      ```
      SELECT Customer_T.CustomerID, Order_T.CustomerID,
        CustomerName, OrderID
          FROM Customer_T, Order_T
            WHERE Customer_T.CustomerID = Order_T. CustomerID
            ORDER BY OrderID
      ```

      Result:

      ```
      CUSTOMERID   CUSTOMERID   CUSTOMERNAME              ORDERID
               1            1   Contemporary Casuals         1001
               8            8   California Classics          1002
              15           15   Mountain Scenes              1003
               5            5   Impressions                  1004
               3            3   Home Furnishings             1005
               2            2   Value Furniture              1006
              11           11   American Euro Lifestyles     1007
              12           12   Battle Creek Furniture       1008
               4            4   Eastern Furniture            1009
               1            1   Contemporary Casuals         1010
      10 rows selected.
      ```

      Note:
      - Notice that we don't get rows where a customer did not place an order.
      - We explictly tell sql the name of the table followed by customerID since mulitple tables have this column
      - Here we are using the WHERE clause to achieve an equi-join

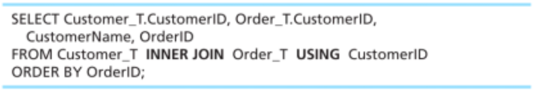
    - 

      Query: What are the customer IDs and names of all customers, along with the order IDs for all the orders they have placed?

      ```
      SELECT Customer_T.CustomerID, Order_T.CustomerID,
         CustomerName, OrderID
      FROM Customer_T  INNER JOIN  Order_T  ON
         Customer_T.CustomerID = Order_T.CustomerID
      ORDER BY OrderID;
      ```

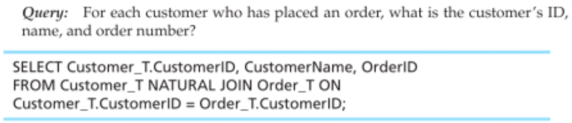
      Result: Same as the previous query.

      Note:
      - This is also an equi-join but we use solely the FROM clause paired with a few keywords to achieve it using INNERJOIN and ON

    - 

      ```
      SELECT Customer_T.CustomerID, Order_T.CustomerID,
         CustomerName, OrderID
      FROM Customer_T  INNER JOIN  Order_T  USING  CustomerID
      ORDER BY OrderID;
      ```

      Note:
      - This is also an equi-join but we use solely the FROM clause paired with a few keywords to achieve it using INNERJOIN and USING, where USING is used if both tables have the same name for a column

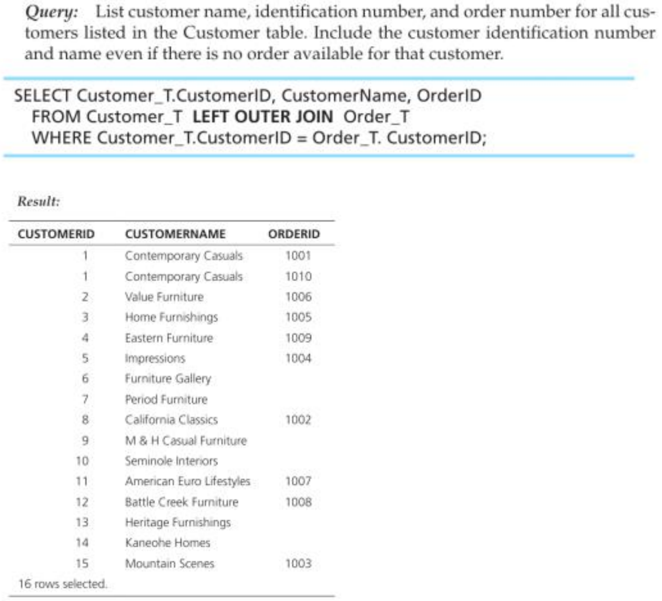
- Natural Join: is the same as an equi-join, except that it is performed over matching columns, and one of the duplicate columns is eliminated in the result table.
  - The natural join is the most commonly used form of join operation.
  - 

    Query: For each customer who has placed an order, what is the customer's ID, name, and order number?

    ```
    SELECT Customer_T.CustomerID, CustomerName, OrderID
    FROM Customer_T NATURAL JOIN Order_T ON
    Customer_T.CustomerID = Order_T.CustomerID;
    ```

- Outer Join: Rows that do not have matching values in common columns are also included in the result table.
  - Example: In joining two tables, you often find that a row in one table does not have a matching row in the other table. For example, several CustomerID numbers do not appear in the Order_T table. This could be because a customer hasn't placed an order yet. We may want to obtain the information about all the

customers even those who havent placed an order yet

- 

  Query: List customer name, identification number, and order number for all customers listed in the Customer table. Include the customer identification number and name even if there is no order available for that customer.

  ```
  SELECT Customer_T.CustomerID, CustomerName, OrderID
    FROM Customer_T  LEFT OUTER JOIN  Order_T
    WHERE Customer_T.CustomerID = Order_T. CustomerID;
  ```

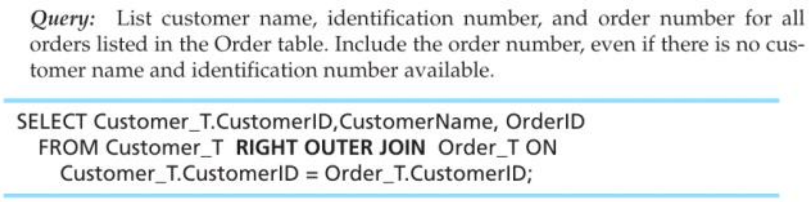
  Result:

CUSTOMERID	CUSTOMERNAME	ORDERID
1	Contemporary Casuals	1001
1	Contemporary Casuals	1010
2	Value Furniture	1006
3	Home Furnishings	1005
4	Eastern Furniture	1009
5	Impressions	1004
6	Furniture Gallery	
7	Period Furniture	
8	California Classics	1002
9	M & H Casual Furniture	
10	Seminole Interiors	
11	American Euro Lifestyles	1007
12	Battle Creek Furniture	1008
13	Heritage Furnishings	
14	Kaneohe Homes	
15	Mountain Scenes	1003

  16 rows selected.

Note:

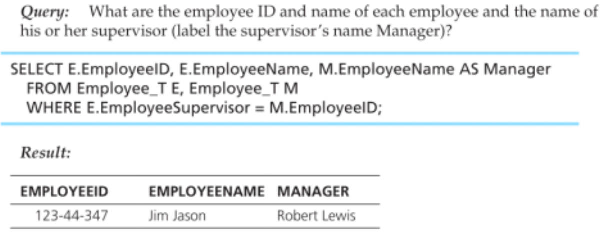
- The syntax LEFT OUTER JOIN was selected because the Customer_T table was named first, and it is the table from which we want all rows returned, regardless of whether there is a matching order in the Order_T table.
- As you can see we used a left outer join which obtained all the rows from Customer including those who did and did not order.
- If we had requested a right outer join we would get data from all the orders which would by the nature of the database we set up where the orders table is dictated by the customer table we should get all the orders back with each one having its customerid so it is essesntially just checking the referential integrity

- ○ We have several outer joins:
  - Left outer join: the table name to the left is the table we get ALL the data from
  - Right outer join: the table name to the right is the table we get ALL the data from
  - Full outer join: all the tables get their data included
- ○ Also, the result table from an outer join may indicate NULL (or a symbol, such as ??) as the values for columns in the second table where no match was achieved. If those columns could have NULL as a data value, you cannot know whether the row returned is a matched row or an unmatched row unless you run another query that checks for null values in the base table or view. Also, a column that is defined as NOT NULL may be assigned a NULL value in the result table of an OUTER JOIN.
- ○ Another example using right outer join
  - 

    Query: List customer name, identification number, and order number for all orders listed in the Order table. Include the order number, even if there is no customer name and identification number available.

    ```
    SELECT Customer_T.CustomerID,CustomerName, OrderID
      FROM Customer_T  RIGHT OUTER JOIN  Order_T ON
        Customer_T.CustomerID = Order_T.CustomerID;
    ```

Essetially just referential integrity checking since all orders must have a customerid and this will obtain all the orders which by the nature of the way we have our database setup will have a customerid associated with it.

- Self Join: There are times when a join requires matching rows in a table with other rows in that same table—that is, joining a table with itself.
  - ○ This is often done with unary relationships
  - ○ Example, in the Employee table an employee can have a column called Supervisor which will hold the EmployeeID of another employee, this relationship is imple mented by placing in the EmployeeSupervisor column the EmployeeID (foreign key) of the employee's supervisor, another employee.
    - 

      Query: What are the employee ID and name of each employee and the name of his or her supervisor (label the supervisor's name Manager)?

      ```
      SELECT E.EmployeeID, E.EmployeeName, M.EmployeeName AS Manager
        FROM Employee_T E, Employee_T M
        WHERE E.EmployeeSupervisor = M.EmployeeID;
      ```

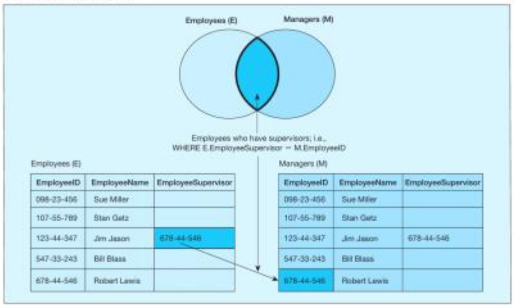
      Result:

EMPLOYEEID	EMPLOYEENAME	MANAGER
123-44-347	Jim Jason	Robert Lewis

Note:

- The select clause is only for telling sql what columns you want to get from and the names of the output
- Since we are essentially tapping into the same table twice we need to give each table and alias such as E and M

- FIGURE 6-5 Example of a self-join



Employees (E)
Managers (M)
Employees who have supervisors; i.e.,
WHERE E.EmployeeSupervisor = M.EmployeeID
Employees (E)
Managers (M)

EmployeeID	EmployeeName	EmployeeSupervisor
098-23-456	Sue Miller	
107-55-789	Stan Getz	
123-44-347	Jim Jason	678-44-546
547-33-243	Bill Blass	
678-44-546	Robert Lewis	

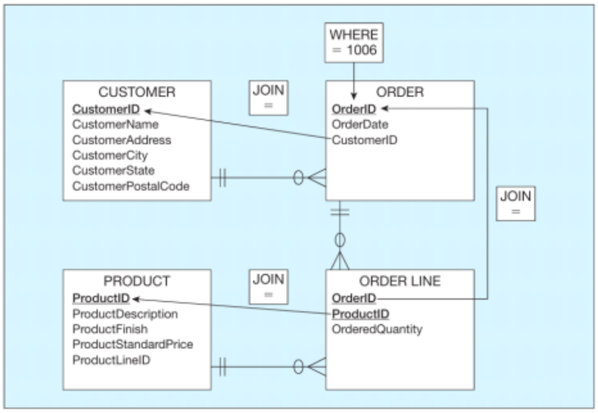
EmployeeID	EmployeeName	EmployeeSupervisor
098-23-456	Sue Miller	
107-55-789	Stan Getz	
123-44-347	Jim Jason	678-44-546
547-33-243	Bill Blass	
678-44-546	Robert Lewis	

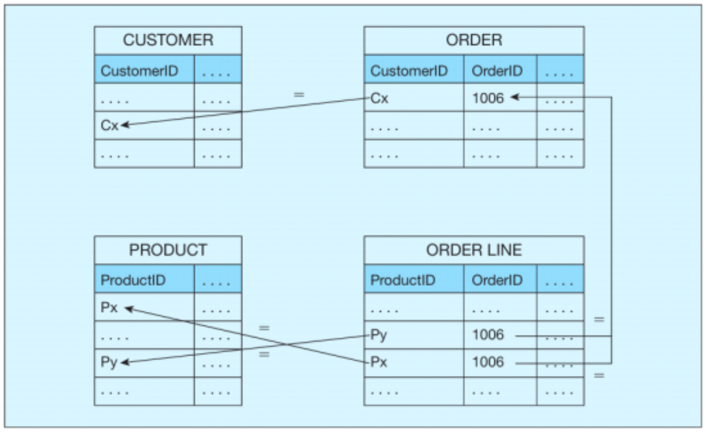
What essentiallly happens in this query is that sql sees the tables as two different tables and so that is a reason we must specify with the alilas E and M the tables

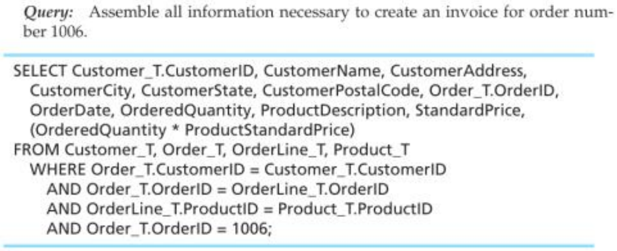
We also see that yea we have essentially a recursive key in the EmployeeSuperviosr column pointing to another employee who is their supervisor.

- There are other queries you can do with unary relations such as
  - For example, which employees have a salary greater than the salary of their manager (baseball players making more money than their manager)
  - is anyone married to his or her manager
- As with any other join, it is not necessary that a self-join be based on a foreign key and a specified unary relationship.
  - For example, when a salesperson is scheduled to visit a particular customer, she might want to know all the other customers who are in the same postal code as the customer she is scheduled to visit.

Sample Join Involving Four Tables

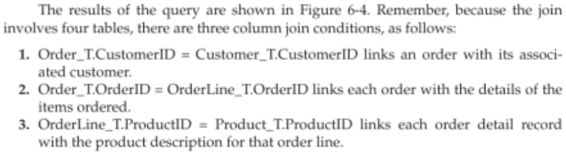
- Here is a sample join query that involves a four-table join. This query produces a result table that includes the information needed to create an invoice for order number 1006. We want the customer information, the order and order line information, and the product information, so we will need to join four tables.
- 



- 

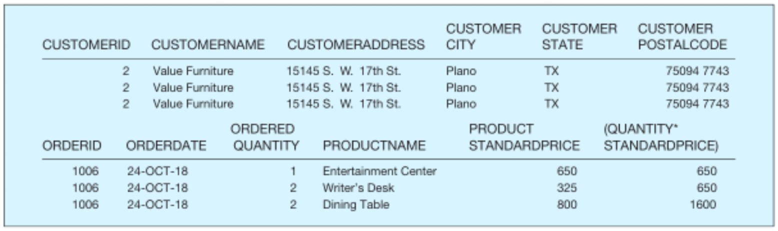
Query: Assemble all information necessary to create an invoice for order number 1006.

```
SELECT Customer_T.CustomerID, CustomerName, CustomerAddress,
   CustomerCity, CustomerState, CustomerPostalCode, Order_T.OrderID,
   OrderDate, OrderedQuantity, ProductDescription, StandardPrice,
   (OrderedQuantity * ProductStandardPrice)
FROM Customer_T, Order_T, OrderLine_T, Product_T
   WHERE Order_T.CustomerID = Customer_T.CustomerID
      AND Order_T.OrderID = OrderLine_T.OrderID
      AND OrderLine_T.ProductID = Product_T.ProductID
      AND Order_T.OrderID = 1006;
```



The results of the query are shown in Figure 6-4. Remember, because the join involves four tables, there are three column join conditions, as follows:

1. Order_T.CustomerID = Customer_T.CustomerID links an order with its associated customer.
2. Order_T.OrderID = OrderLine_T.OrderID links each order with the details of the items ordered.
3. OrderLine_T.ProductID = Product_T.ProductID links each order detail record with the product description for that order line.

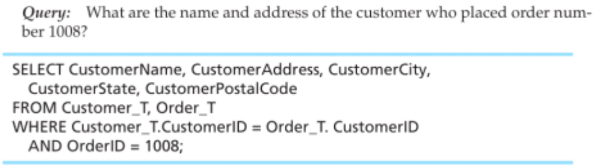
- 

CUSTOMERID	CUSTOMERNAME	CUSTOMERADDRESS	CUSTOMER CITY	CUSTOMER STATE	CUSTOMER POSTALCODE
2	Value Furniture	15145 S. W. 17th St.	Plano	TX	75094 7743
2	Value Furniture	15145 S. W. 17th St.	Plano	TX	75094 7743
2	Value Furniture	15145 S. W. 17th St.	Plano	TX	75094 7743

ORDERID	ORDERDATE	ORDERED QUANTITY	PRODUCTNAME	PRODUCT STANDARDPRICE	(QUANTITY* STANDARDPRICE)
1006	24-OCT-18	1	Entertainment Center	650	650
1006	24-OCT-18	2	Writer's Desk	325	650
1006	24-OCT-18	2	Dining Table	800	1600

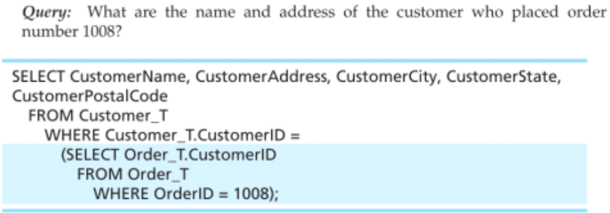
Result

Subqueries: which involves placing an inner query (SELECT . . . FROM . . . WHERE) within a WHERE or HAVING clause of another (outer) query.

- This is another approach to joining two tables
- The inner query provides a set of one or more values for the search condition of the outer query.
- What is the difference between join and subquery?
    - Sometimes, either the joining or the subquery technique can be used to accomplish the same result, and different people will have different preferences about which tech nique to use.
    - Other times, only a join or only a subquery will work.
    - The joining technique is useful when data from several relations are to be retrieved and displayed and the relationships are not necessarily nested
    - the subquery technique allows you to display data from only the tables mentioned in the outer query
    - Example of join vs subquery:
        - 

          Query: What are the name and address of the customer who placed order number 1008?

          ```
          SELECT CustomerName, CustomerAddress, CustomerCity,
            CustomerState, CustomerPostalCode
          FROM Customer_T, Order_T
          WHERE Customer_T.CustomerID = Order_T. CustomerID
            AND OrderID = 1008;
          ```

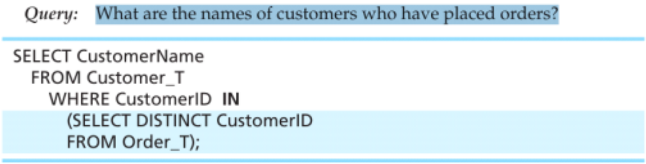
          A join example
        - 

          Query: What are the name and address of the customer who placed order number 1008?

          ```
          SELECT CustomerName, CustomerAddress, CustomerCity, CustomerState,
          CustomerPostalCode
            FROM Customer_T
              WHERE Customer_T.CustomerID =
                (SELECT Order_T.CustomerID
                  FROM Order_T
                    WHERE OrderID = 1008);
          ```

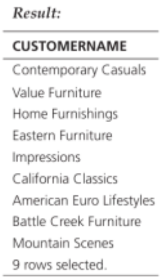
          A subquery example
            - □ Notice that the subquery, shaded in blue and enclosed in parentheses, follows the form learned for constructing SQL queries and could stand on its own as an independent query.
            - □ To be safe, you can—and probably should—use the IN operator rather than = when writing subqueries.
            - □ The value for OrderID does not appear in the query result; it is used as the selection criterion in the inner query. To include data from the subquery in the result, use the join technique because data from a subquery cannot be included in the final results.
            - □ As noted previously, we know in advance that the preceding subquery will return at most one value, the CustomerID associated with OrderID 1008. The result will be empty if an order with that ID does not exist.
                - ◆ (It is advisable to check that your query will work if a subquery returns zero, one, or many values.)

Using the IN keyword

- 

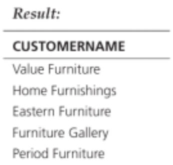
  Query: What are the names of customers who have placed orders?

  ```
  SELECT CustomerName
    FROM Customer_T
      WHERE CustomerID  IN
        (SELECT DISTINCT CustomerID
        FROM Order_T);
  ```

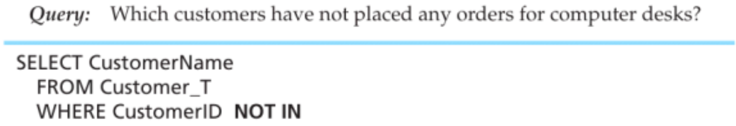
  Using the IN keyword
    - This query produces the following result. As required, the subquery select list con tains only the one attribute, CustomerID, needed in the WHERE clause of the outer query. Distinct is used in the subquery because we do not care how many orders a cus tomer has placed, as long as they have placed an order. For each customer identified in the Order_T table, that customer's name has been returned from Customer_T.
    - 

      Result:

CUSTOMERNAME
Contemporary Casuals
Value Furniture
Home Furnishings
Eastern Furniture
Impressions
California Classics
American Euro Lifestyles
Battle Creek Furniture
Mountain Scenes
9 rows selected.
    - The qualifiers NOT, ANY, and ALL may be used in front of IN or with logical operatc

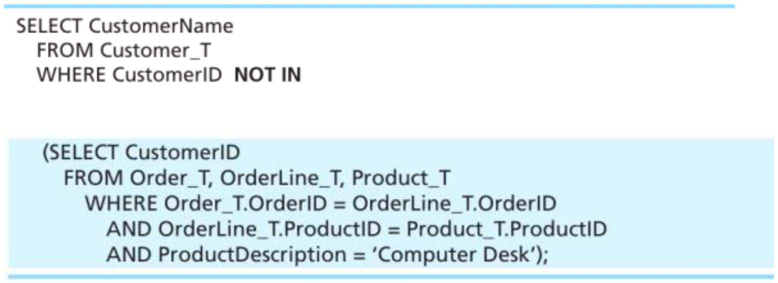
      

      Result:

CUSTOMERNAME
Value Furniture
Home Furnishings
Eastern Furniture
Furniture Gallery
Period Furniture
        - 

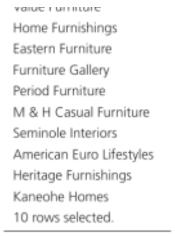
          Query: Which customers have not placed any orders for computer desks?

          ```
          SELECT CustomerName
            FROM Customer_T
            WHERE CustomerID  NOT IN
          ```

- ▪ 

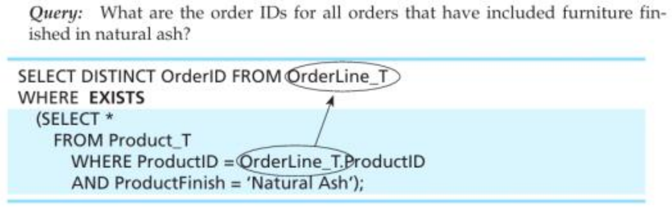
```
SELECT CustomerName
  FROM Customer_T
  WHERE CustomerID  NOT IN

   (SELECT CustomerID
     FROM Order_T, OrderLine_T, Product_T
       WHERE Order_T.OrderID = OrderLine_T.OrderID
         AND OrderLine_T.ProductID = Product_T.ProductID
         AND ProductDescription = 'Computer Desk');
```



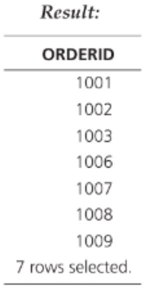
```
Value Furniture
Home Furnishings
Eastern Furniture
Furniture Gallery
Period Furniture
M & H Casual Furniture
Seminole Interiors
American Euro Lifestyles
Heritage Furnishings
Kaneohe Homes
10 rows selected.
```

  - □ The inner query returned a list (set) of all customers who had ordered computer desks. The outer query listed the names of those customers who were not in the list returned by the inner query

- Using Exist and not Exist
  - ○ EXISTS will take a value of true if the subquery returns an intermediate result table that contains one or more rows (i.e., a nonempty set) and false if no rows are returned (i.e., an empty set). NOT EXISTS will take a value of true if no rows are returned and false if one or more rows are returned.
  - ○ IN vs EXIST
    - ▪ You use EXISTS (NOT EXISTS) when your only interest is whether the subquery returns a nonempty (empty) set (i.e., you don't care what is in the set, just whether it is empty), and you use IN (NOT IN) when you need to know what values are (are not) in the set.
  - ○ 

Query: What are the order IDs for all orders that have included furniture finished in natural ash?

```
SELECT DISTINCT OrderID FROM OrderLine_T
WHERE  EXISTS
  (SELECT *
    FROM Product_T
      WHERE ProductID = OrderLine_T.ProductID
      AND ProductFinish = 'Natural Ash');
```



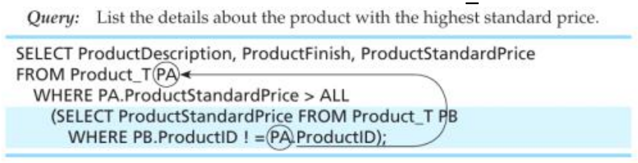
Result:

```
ORDERID
     1001
     1002
     1003
     1006
     1007
     1008
     1009
7 rows selected.
```

The subquery is different from the subqueries that you have seen before because it will include a reference to a column in a table specified in the outer query. The subquery is executed for each order line in the outer query. The subquery checks for each order line to see if the finish for the product on that order line is natural ash (indicated by the arrow added to the query above).

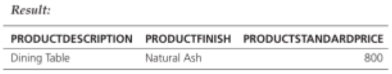
- Essentially since this is a subquery the inner query shouldn't really need to depend on the outer query but in this case we do since the outer query tells us what columns we must check

The purpose of the subquery is to test whether any rows fit the conditions, not to return values from particular columns for comparison purposes in the outer query. The columns that will be displayed are determined strictly by the outer query.

- Correlated Subqueries: use the result of the outer query to determine the processing of the inner query.
  - ○ In this case, the inner query must be computed for each outer row
    - ▪ Meaning we will look at each row in the outer query almost like a for loop
  - ○ The EXISTS subquery example in the prior section had this characteristic, in which the inner query was executed for each OrderLine_T row, and each time it was executed, the inner query was for a different ProductID value—the one from the OrderLine_T row in the outer query.
  - ○ 

Query: List the details about the product with the highest standard price.

```
SELECT ProductDescription, ProductFinish, ProductStandardPrice
FROM Product_T PA
  WHERE PA.ProductStandardPrice > ALL
    (SELECT ProductStandardPrice FROM Product_T PB
      WHERE PB.ProductID ! = PA.ProductID);
```



Result:

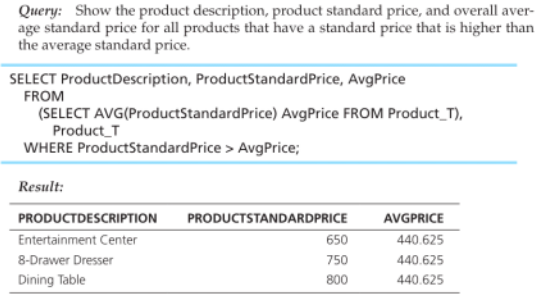
```
PRODUCTDESCRIPTION  PRODUCTFINISH  PRODUCTSTANDARDPRICE
Dining Table        Natural Ash                     800
```

The logic of this SQL statement is that the subquery will be executed once for each product to be sure that no other product has a higher standard price.

Notice that we are comparing rows in a table to themselves and that we are able to do this by giving the table two aliases, PA and PB;

How it works:
When the subquery is executed, it will return a set of values, which are the standard prices of every product except the one being considered in the outer query (product 1, for the first time it is executed). Then the outer query will check to see if the standard price for the product being considered is greater than all of the standard prices returned by the subquery. If it is, it will be returned as the result of the query. If not, the next standard price value in the outer query will be considered, and the inner query will return a list of all the standard prices for the other products. The list returned by the inner query changes as each product in the outer query changes;

Using Derived Tables

- Subqueries are not limited to inclusion in the WHERE clause. They may also be used in the FROM clause to create a temporary derived table (or set) that is used in the query.
- Creating a derived table that has an aggregate value in it, such as MAX, AVG, or MIN, allows the aggregate to be used in the WHERE clause.
- 

Query: Show the product description, product standard price, and overall average standard price for all products that have a standard price that is higher than the average standard price.

```
SELECT ProductDescription, ProductStandardPrice, AvgPrice
  FROM
    (SELECT AVG(ProductStandardPrice) AvgPrice FROM Product_T),
      Product_T
  WHERE ProductStandardPrice > AvgPrice;
```

Result:

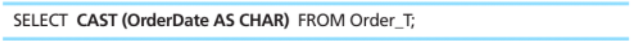
PRODUCTDESCRIPTION	PRODUCTSTANDARDPRICE	AVGPRICE
Entertainment Center	650	440.625
8-Drawer Dresser	750	440.625
Dining Table	800	440.625

So, why did this query require a derived table rather than, say, a subquery? The reason is we want to display both the standard price and the average standard price for each of the selected products.

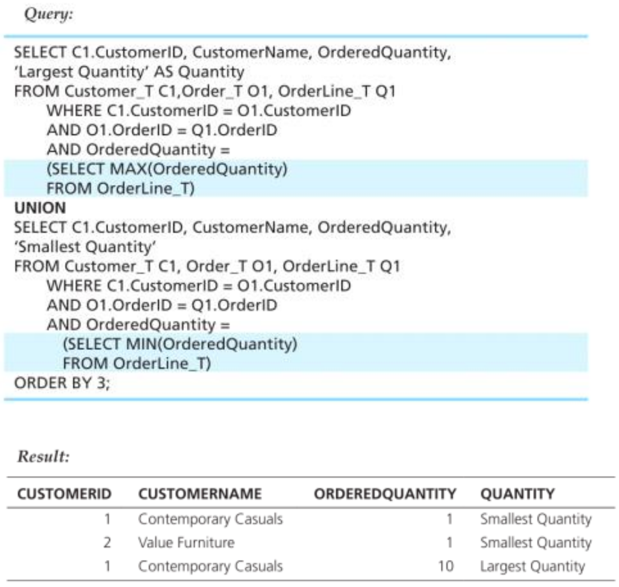
to show both standard price and the average standard price in each displayed row, we have to get both values into the "outer" query, as is done in the query above.

This is all one outer query no inner queries are present here

Combining Queries:

- Sometimes, no matter how clever you are, you can't get all the rows you want into the single answer table using one SELECT statement.
- The UNION clause is used to combine the output (i.e., union the set of rows) from multiple queries together into a single result table.
- To use the UNION clause, each query involved must output the same number of columns, and they must be UNION compatible. This means that the output from each query for each column should be of compatible data types.
  - When performing a union where output for a column will merge two different data types, it is safest to use the CAST command to control the data type conversion yourself.
  - 

```
SELECT CAST (OrderDate AS CHAR) FROM Order_T;
```

- The following query determines the customer(s) who has in a given line item pur chased the largest quantity of any Pine Valley product and the customer(s) who has in a given line item purchased the smallest quantity and returns the results in one table.
  - 

Query:

```
SELECT C1.CustomerID, CustomerName, OrderedQuantity,
'Largest Quantity' AS Quantity
FROM Customer_T C1,Order_T O1, OrderLine_T Q1
    WHERE C1.CustomerID = O1.CustomerID
    AND O1.OrderID = Q1.OrderID
    AND OrderedQuantity =
    (SELECT MAX(OrderedQuantity)
    FROM OrderLine_T)
UNION
SELECT C1.CustomerID, CustomerName, OrderedQuantity,
'Smallest Quantity'
FROM Customer_T C1, Order_T O1, OrderLine_T Q1
    WHERE C1.CustomerID = O1.CustomerID
    AND O1.OrderID = Q1.OrderID
    AND OrderedQuantity =
      (SELECT MIN(OrderedQuantity)
      FROM OrderLine_T)
ORDER BY 3;
```

Result:

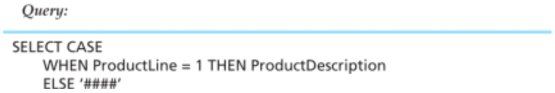
CUSTOMERID	CUSTOMERNAME	ORDEREDQUANTITY	QUANTITY
1	Contemporary Casuals	1	Smallest Quantity
2	Value Furniture	1	Smallest Quantity
1	Contemporary Casuals	10	Largest Quantity

Notes:

- Notice that an expression Quantity has been created in which the strings 'Smallest Quantity' and 'Largest Quantity' have been inserted for readability.
  - The result has a qauntity column which either has smallest quantity or largest quantity and it was just created for readability purposes.
- Two queries doing virtually the same thing on the same table where one is finding the largest and the other is finding the smallest number of items purchases by some customer and displaying it

- Now that you remember the union set operation from discrete mathematics, you may also remember that there are other set operations—intersect (to find the elements in common between two sets) and minus (to find the elements in one set that are not in another set). These operations—INTERSECT and MINUS—are also available in SQL, and they are used just as UNION was above to manipulate the result sets created by two SELECT statements.

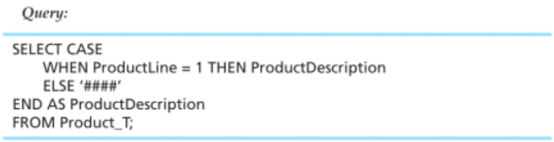
Conditional Expressions: Establishing IF-THEN-ELSE logical processing within an SQL statement can now be accomplished by using the CASE key word in a statement.

- CASE could be used in constructing a query that asks, "What products are included in Product Line 1?"
  - 

Query:

```
SELECT CASE
    WHEN ProductLine = 1 THEN ProductDescription
    ELSE '####'
```

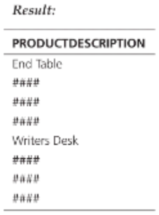
In this example, the query displays the product description for each product in the specified product line and a special text, '####,' for all other products, thus displaying a sense of the relative proportion

○ 

Query:

```
SELECT CASE
     WHEN ProductLine = 1 THEN ProductDescription
     ELSE '####'
END AS ProductDescription
FROM Product_T;
```

In this example, the query displays the product description for each product in the specified product line and a special text, '####,' for all other products, thus displaying a sense of the relative proportion of products in the specified product line.

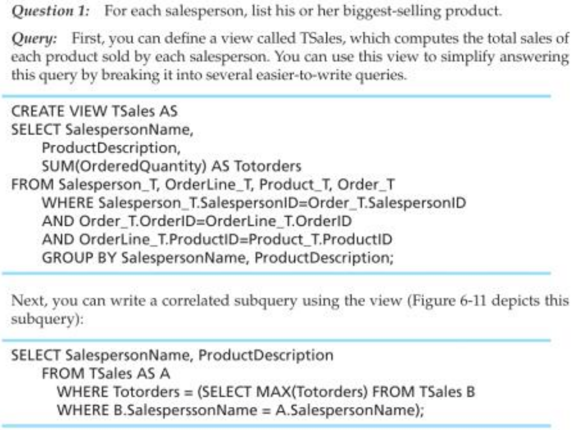


Result:

PRODUCTDESCRIPTION
End Table
####
####
####
Writers Desk
####
####
####

- "It's possible to use CASE expressions this way as retrieval substitutes, but the more common applications are (a) to make up for SQL's lack of an enumerated , (b) to perform complicated if/then calcu lations, (c) for translation, and (d) to avoid exceptions.

More Complicated SQL Queries

- 

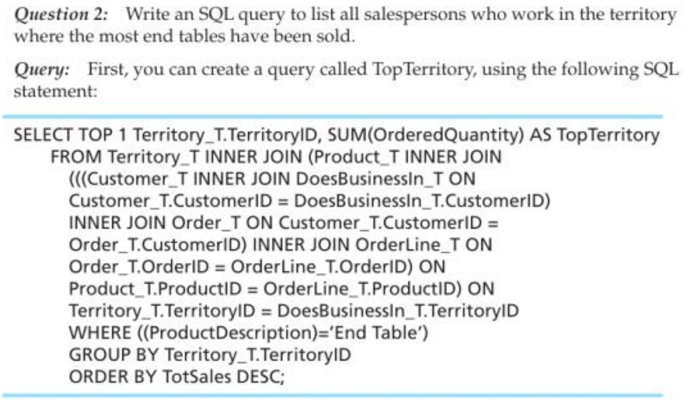
Question 1: For each salesperson, list his or her biggest-selling product.

Query: First, you can define a view called TSales, which computes the total sales of each product sold by each salesperson. You can use this view to simplify answering this query by breaking it into several easier-to-write queries.

```
CREATE VIEW TSales AS
SELECT SalespersonName,
     ProductDescription,
     SUM(OrderedQuantity) AS Totorders
FROM Salesperson_T, OrderLine_T, Product_T, Order_T
     WHERE Salesperson_T.SalespersonID=Order_T.SalespersonID
     AND Order_T.OrderID=OrderLine_T.OrderID
     AND OrderLine_T.ProductID=Product_T.ProductID
     GROUP BY SalespersonName, ProductDescription;
```

Next, you can write a correlated subquery using the view (Figure 6-11 depicts this subquery):

```
SELECT SalespersonName, ProductDescription
     FROM TSales AS A
       WHERE Totorders = (SELECT MAX(Totorders) FROM TSales B
       WHERE B.SalesperssonName = A.SalespersonName);
```

- 

Question 2: Write an SQL query to list all salespersons who work in the territory where the most end tables have been sold.

Query: First, you can create a query called TopTerritory, using the following SQL statement:

```
SELECT TOP 1 Territory_T.TerritoryID, SUM(OrderedQuantity) AS TopTerritory
     FROM Territory_T INNER JOIN (Product_T INNER JOIN
       (((Customer_T INNER JOIN DoesBusinessIn_T ON
       Customer_T.CustomerID = DoesBusinessIn_T.CustomerID)
       INNER JOIN Order_T ON Customer_T.CustomerID =
       Order_T.CustomerID) INNER JOIN OrderLine_T ON
       Order_T.OrderID = OrderLine_T.OrderID) ON
       Product_T.ProductID = OrderLine_T.ProductID) ON
       Territory_T.TerritoryID = DoesBusinessIn_T.TerritoryID
       WHERE ((ProductDescription)='End Table')
       GROUP BY Territory_T.TerritoryID
       ORDER BY TotSales DESC;
```