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 CECS323 Section 04
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Relational Algebra 2

1. List the names of all Customers that are in the same state as one of our Offices.

$$\pi_{\text{customername}} \sigma_{\text{customers.state} = \text{Offices.state and customers.state} \neq \text{null and Offices.state} \neq \text{null}} (\text{customers} \bowtie \text{customers.state} = \text{Offices.state} \text{ Offices})$$

2. List the names of all Customers who have ordered Products where the vendor is “Classic Metal Creations”.

$$\pi_{\text{customername}} \sigma_{\text{products.productVendor} = \text{'Classic Metal Creations'}} ((\text{customers} \bowtie_{\text{customers.customerNumber} = \text{orders.customerNumber}} \text{orders}) \bowtie_{\text{orders.orderNumber} = \text{OrderDetails.orderNumber}} \text{OrderDetails}) \bowtie_{\text{OrderDetails.productCode} = \text{products.productCode}} \text{products})$$

3. List the names of all Customers whose Order was shipped within three days of being ordered. Assume that you can subtract one date from another to get the number of days between two dates in Relational Algebra.

$$\pi_{\text{customername}} \sigma_{\text{day(ShippedDate)} - \text{day(orderDate)} \leq 3} (\text{customers} \bowtie_{\text{customers.customerNumber} = \text{orders.customerNumber}} \text{orders})$$

4. List the names of all Customers, their service rep and the Office that the service rep for that customer works in.

$$\pi_{\text{customername, Employees.lastName, Employees.firstName, Offices.city, Offices.state, Offices.country}} ((\text{customers} \bowtie_{\text{customers.salesRepEmployeeNumber} = \text{Employees.employeeNumber}} \text{Employees}) \bowtie_{\text{Employees.officeCode} = \text{Offices.officeCode}} \text{Offices})$$

5. List the Employee first and last name, and their Customer’s name **even if** the Employee is **not** working with a Customer.

$$\tau_{\text{customers.customername desc}} \pi_{\text{firstName, lastName, customers.customername}} (\text{Employees} \rightrightarrows_{\text{Employees.employeeNumber} = \text{customers.salesRepEmployeeNumber}} \text{customers})$$

6. List all the possible statuses for an order.

$$\pi_{\text{status}} \text{orders}$$

7. List the Order Number for all Orders in the 'On Hold' status where the quantity of a product ordered is greater than the quantity of that product on hand.

$$\pi_{\text{OrderDetails.orderNumber}} \sigma_{\text{OrderDetails.quantityOrdered} > \text{products.quantityInStock} \text{ and } \text{orders.status} = \text{'On Hold'}} ((\text{OrderDetails} \bowtie_{\text{OrderDetails.orderNumber} = \text{orders.orderNumber}} \text{orders}) \bowtie_{\text{OrderDetails.productCode} = \text{products.productCode}} \text{products})$$

8. List the Employee LastName and FirstName that work in Japan.

$$\pi_{\text{Employees.lastName}, \text{Employees.firstName}} \sigma_{\text{country} = \text{'Japan'}} (\text{Employees} \bowtie_{\text{Employees.officeCode} = \text{Offices.officeCode}} \text{Offices})$$

9. List the productLine, the ProductName and the quantityOrdered for all products ordered during the month of July. You will need a sigma that checks for month(orderDate) = 'July'.

$$\pi_{\text{productLine}, \text{productName}, \text{quantityOrdered}} \sigma_{\text{month}(\text{orderDate}) = \text{'July'}} ((\text{products} \bowtie_{\text{products.productCode} = \text{OrderDetails.productCode}} \text{OrderDetails}) \bowtie_{\text{OrderDetails.orderNumber} = \text{orders.orderNumber}} \text{orders})$$

10. List the customerName, the paymentDate, and the amount on all payments that exceeded \$1000.

$$\pi_{\text{customername}, \text{paymentDate}, \text{amount}} \sigma_{\text{amount} > 1000} (\text{customers} \bowtie_{\text{customers.customerNumber} = \text{payments.customerNumber}} \text{payments})$$

11. List the productLine for all products ordered by customers from the State of 'Louisiana'.

$$\pi_{\text{productLine}} \sigma_{\text{customers.state} = \text{'Louisiana'}} (((\text{products} \bowtie_{\text{products.productCode} = \text{OrderDetails.productCode}} \text{OrderDetails}) \bowtie_{\text{OrderDetails.orderNumber} = \text{orders.orderNumber}} \text{orders}) \bowtie_{\text{orders.customerNumber} = \text{customers.customerNumber}} \text{customers})$$