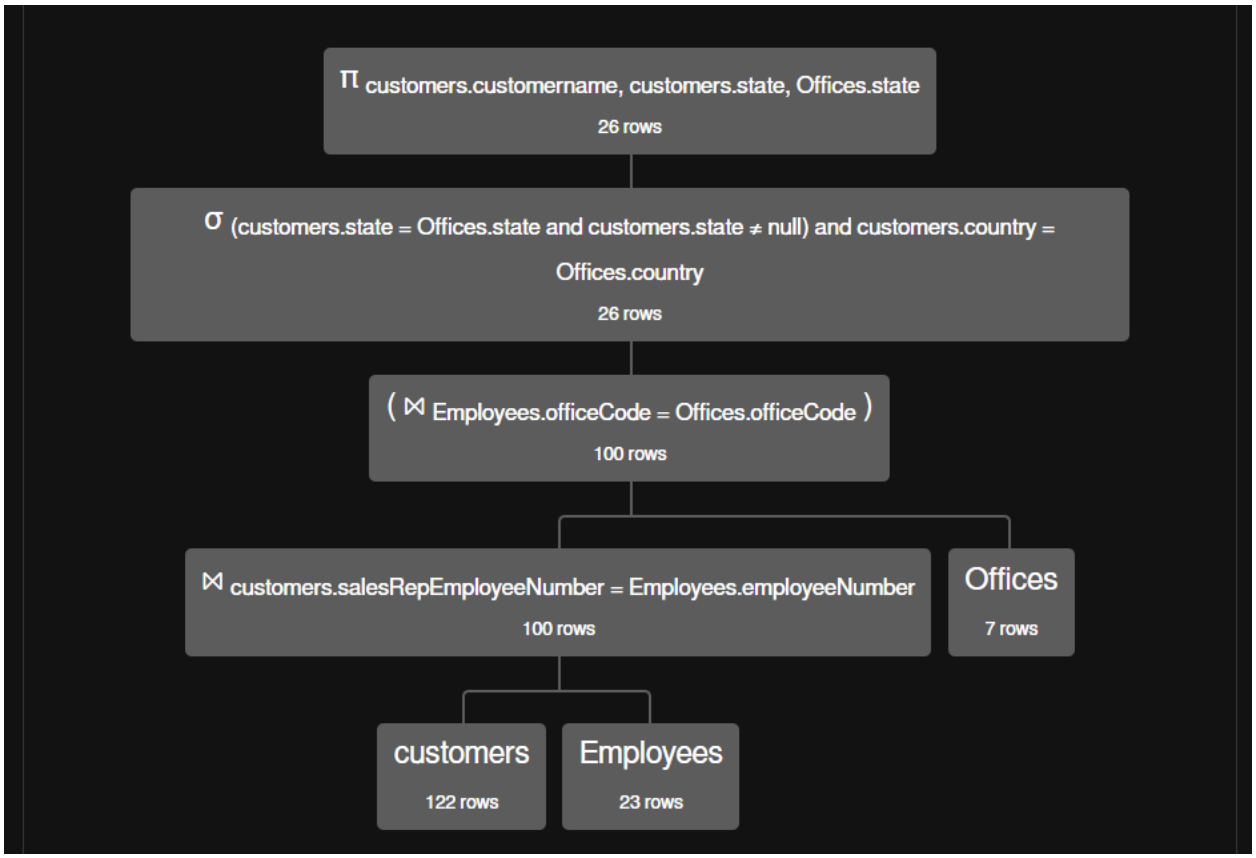
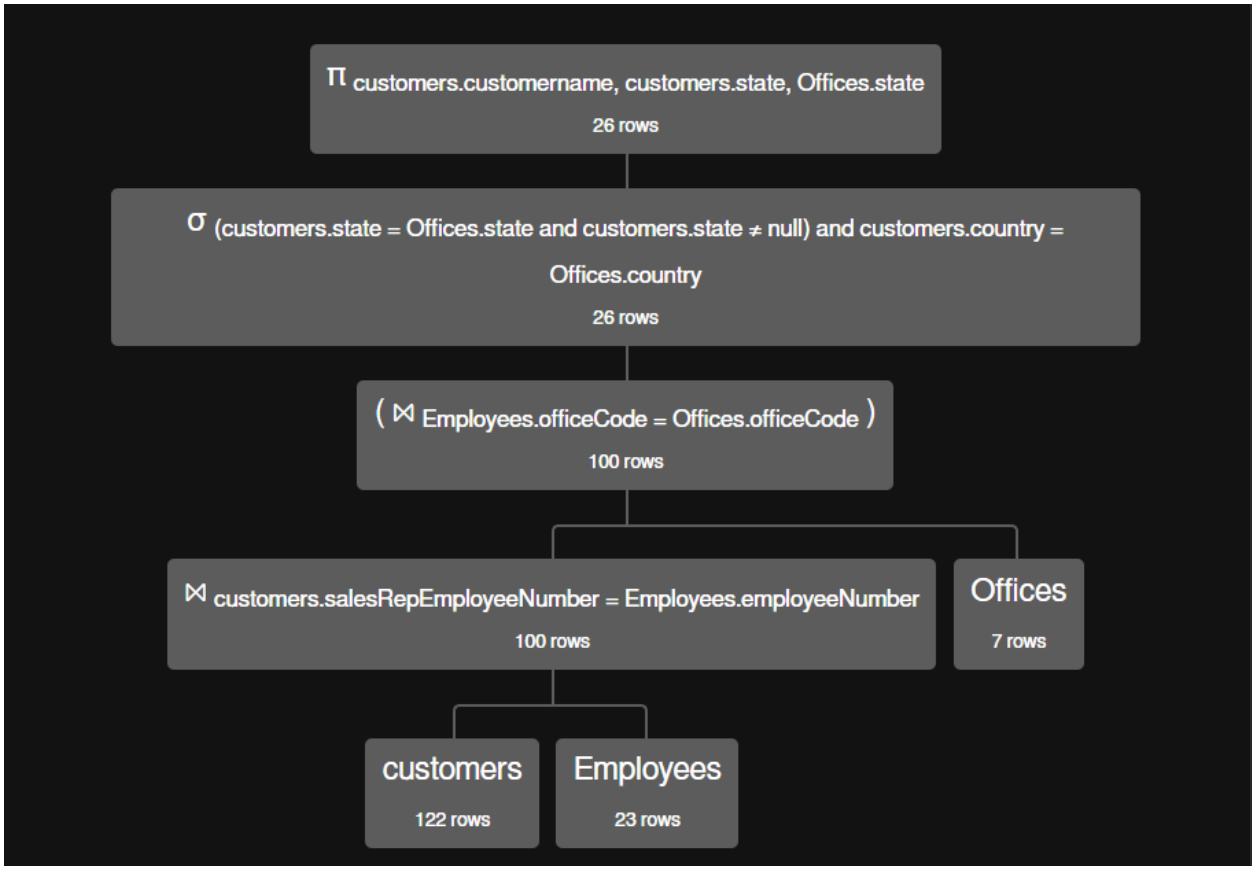
1. List the customerName of all customers who live in a state that does not have one of our offices. Consider that a state name is only unique within a given country. For instance, both Russia and the US have a state called Georgia. Do not worry about the sales representative connection between Employee and Customer. Just compare state to state and country to country between customer and offices.

π customers.customername, customers.state, Offices.state
σ (customers.state = Offices.state ∧ customers.state ≠ null) ∧ customers.country = Offices.country
(customers ⋈ customers.salesRepEmployeeNumber = Employees.employeeNumber
Employees ⋈ Employees.officeCode = Offices.officeCode Offices)



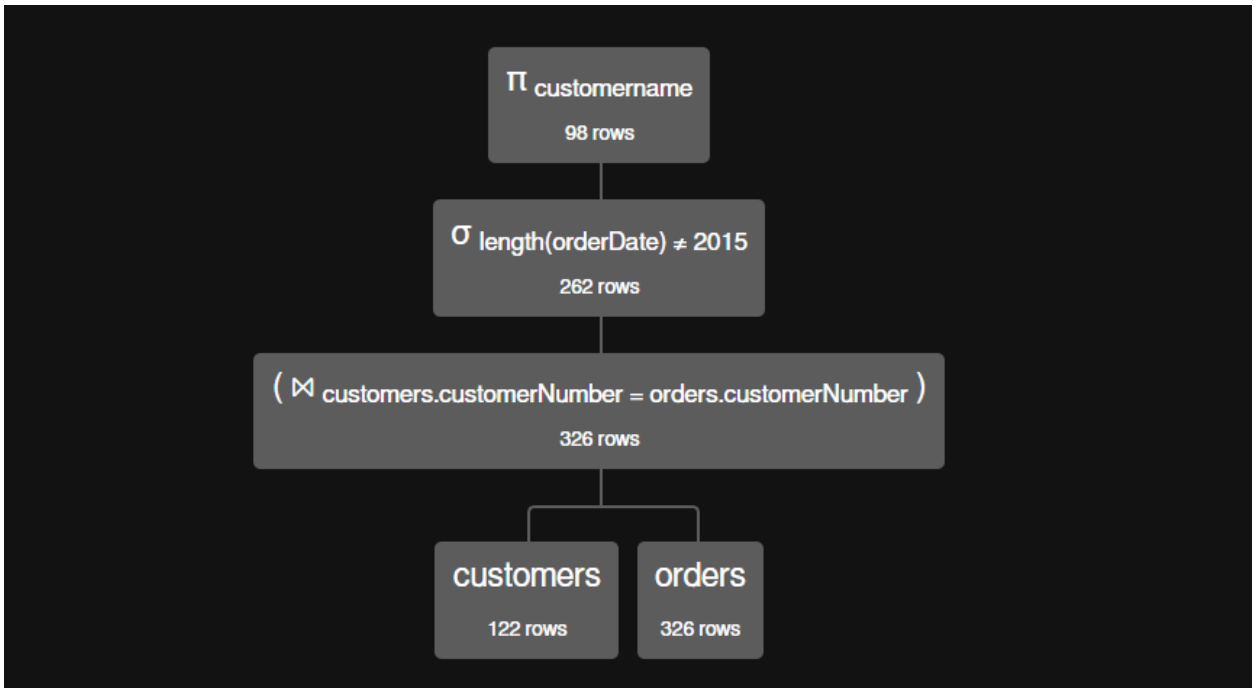
2. List productCode, productName, and productVendor for each product that has never been ordered in June. Remember that we have the month function that returns the number of the month component of a data, and January is month number 1.

π products.productCode, productName, productVendor
σ month(orderDate) ≠ 6
(products ⋈ products.productCode = OrderDetails.productCode
OrderDetails ⋈ OrderDetails.orderNumber = orders.orderNumber orders)



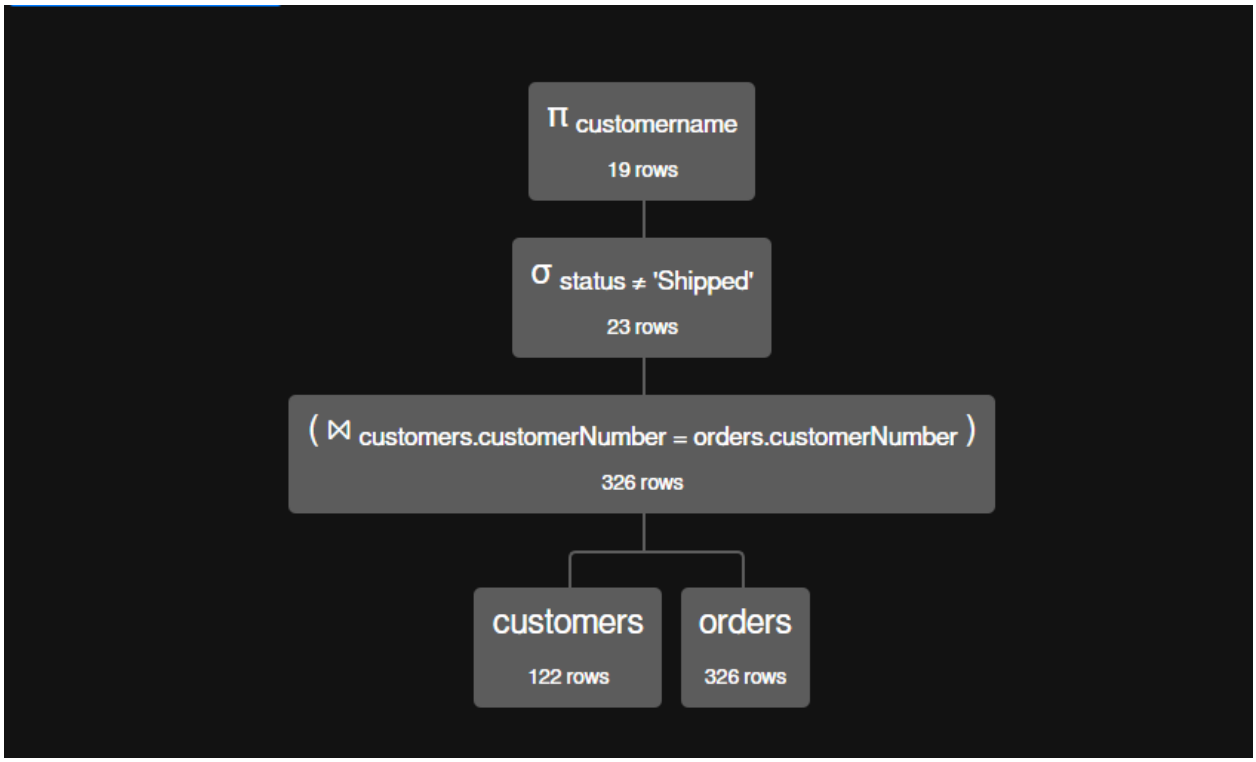
3. List the Customers that did not Order any products in 2015.

π customername
σ year(orderDate) ≠ 2015
(customers ⋈ customers.customerNumber = orders.customerNumber orders)



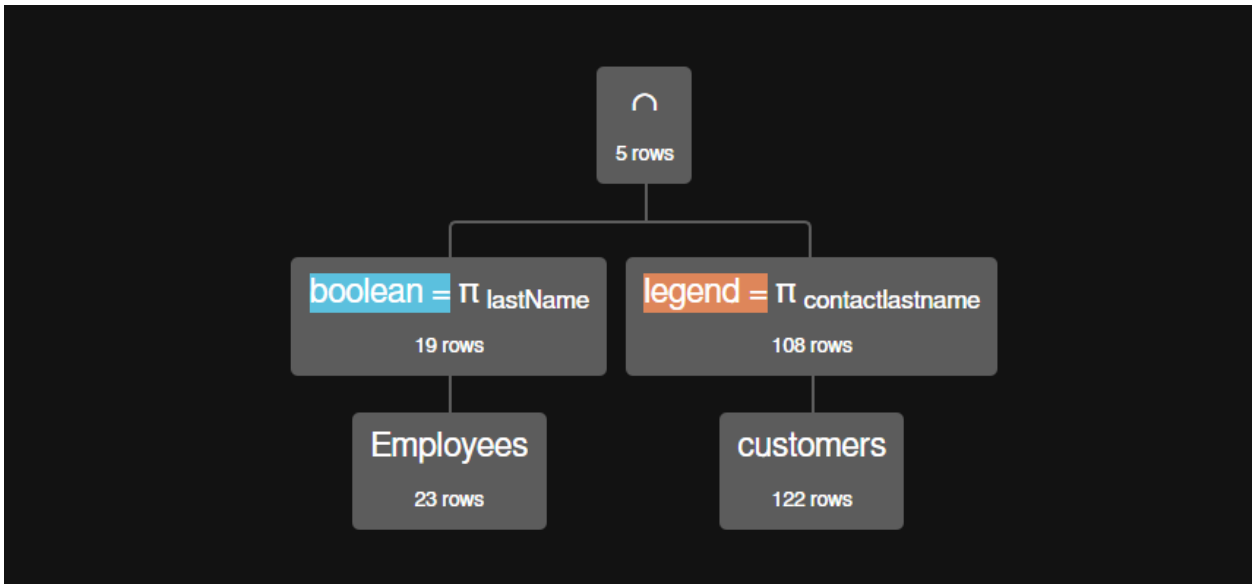
4. List all CustomerNames who have never had an order go to the ‘Shipped’ status.

π customername
σ status ≠ 'Shipped'
(customers ⋈ customers.customerNumber = orders.customerNumber orders)



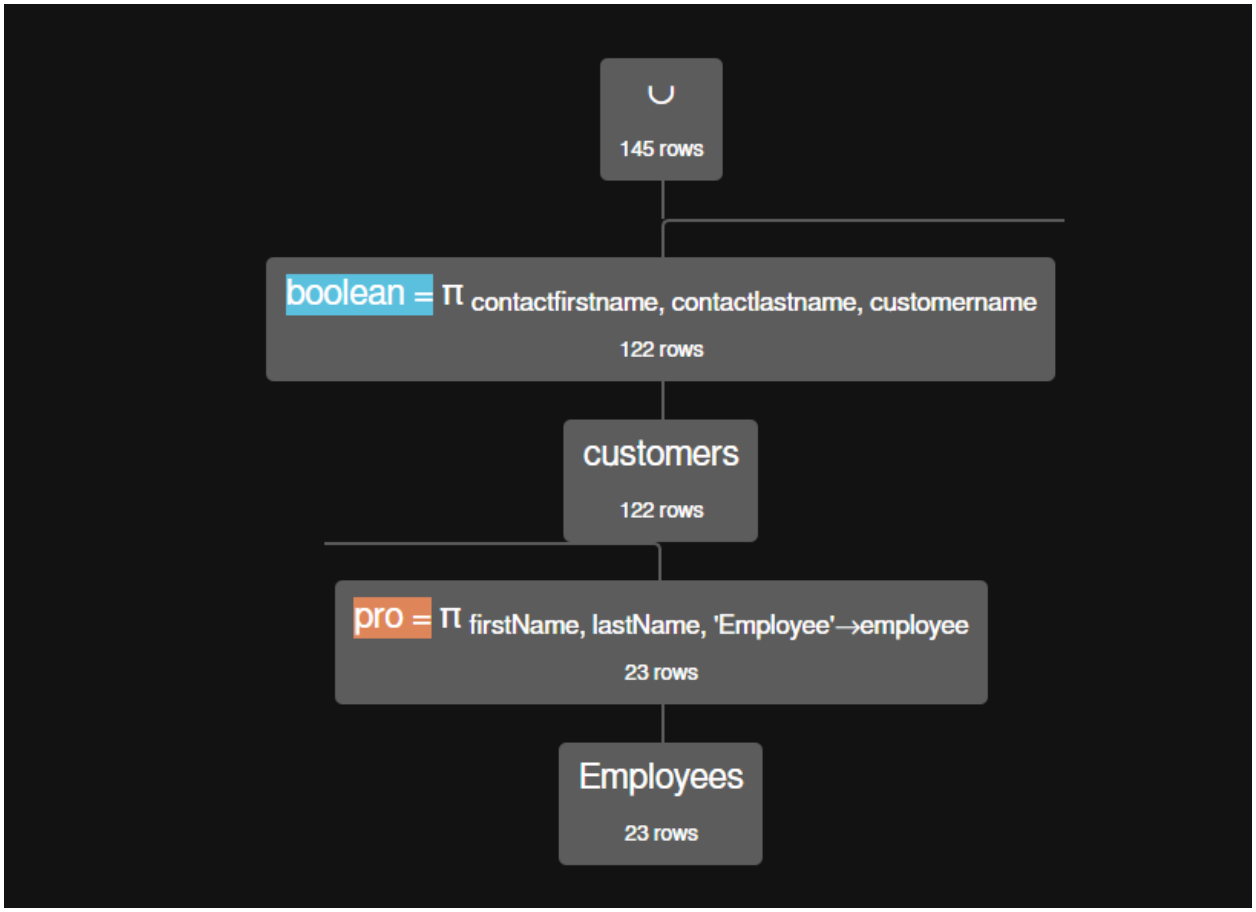
5. Using a set operator, list the last names of those employees if there is at least one customer who also has a contact with that same last name.

boolean = (π lastName Employees)
legend = (π contactlastname customers)
boolean ∩ legend



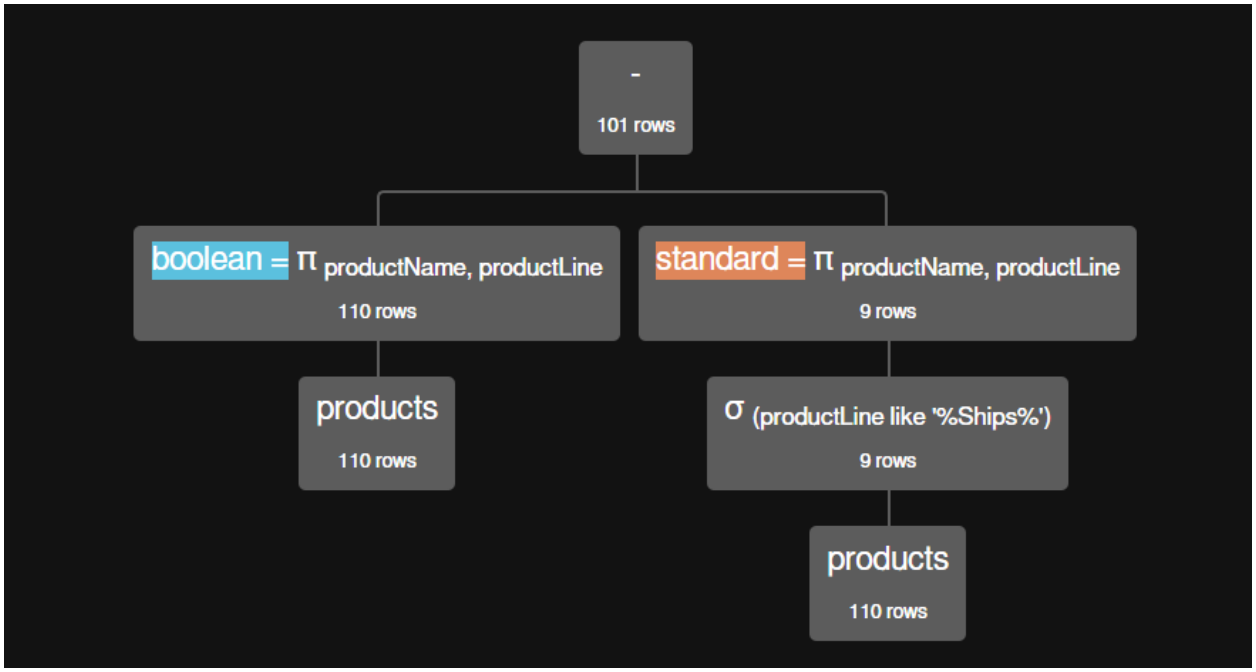
6. List all people that we deal with (employees and customer contacts). Display first name, last name, customer name (or just the literal ‘Employee’ for employees).

boolean = π contactfirstname, contactlastname, customername (customers)
pro = π firstName, lastName, 'Employee' → employee (Employees)
boolean ∪ pro



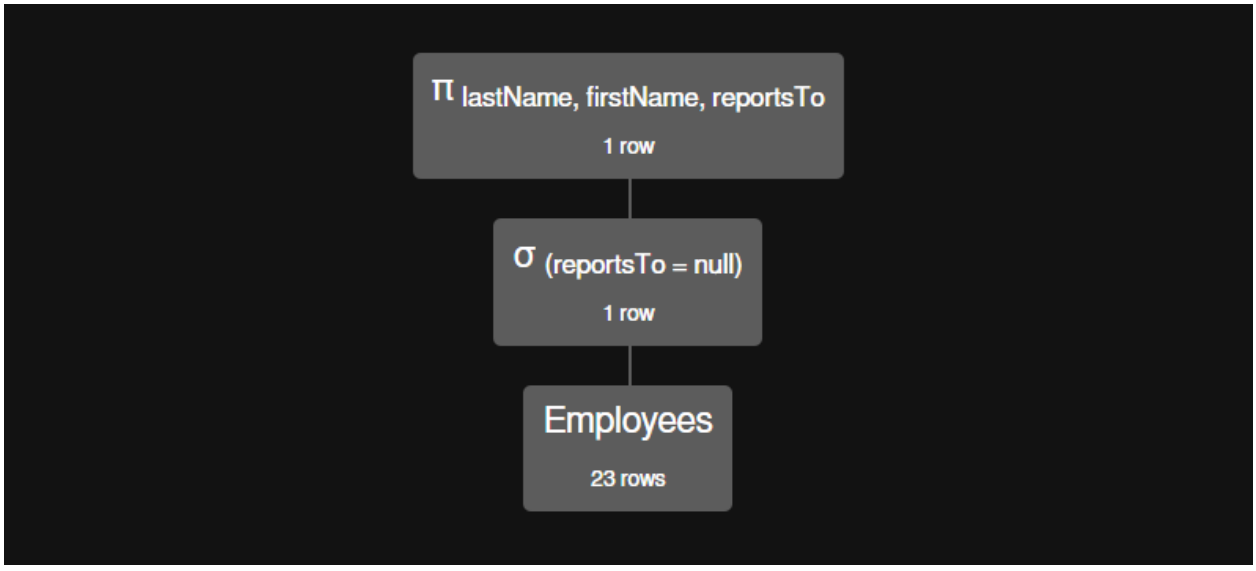
7. List the names of each Product and the ProductLine which the product belongs to for all of the Products which are not ‘Ships’.

boolean = (π productName, productLine products)
standard = (π productName, productLine
σ (productLine like '%Ships%') products)
boolean - standard



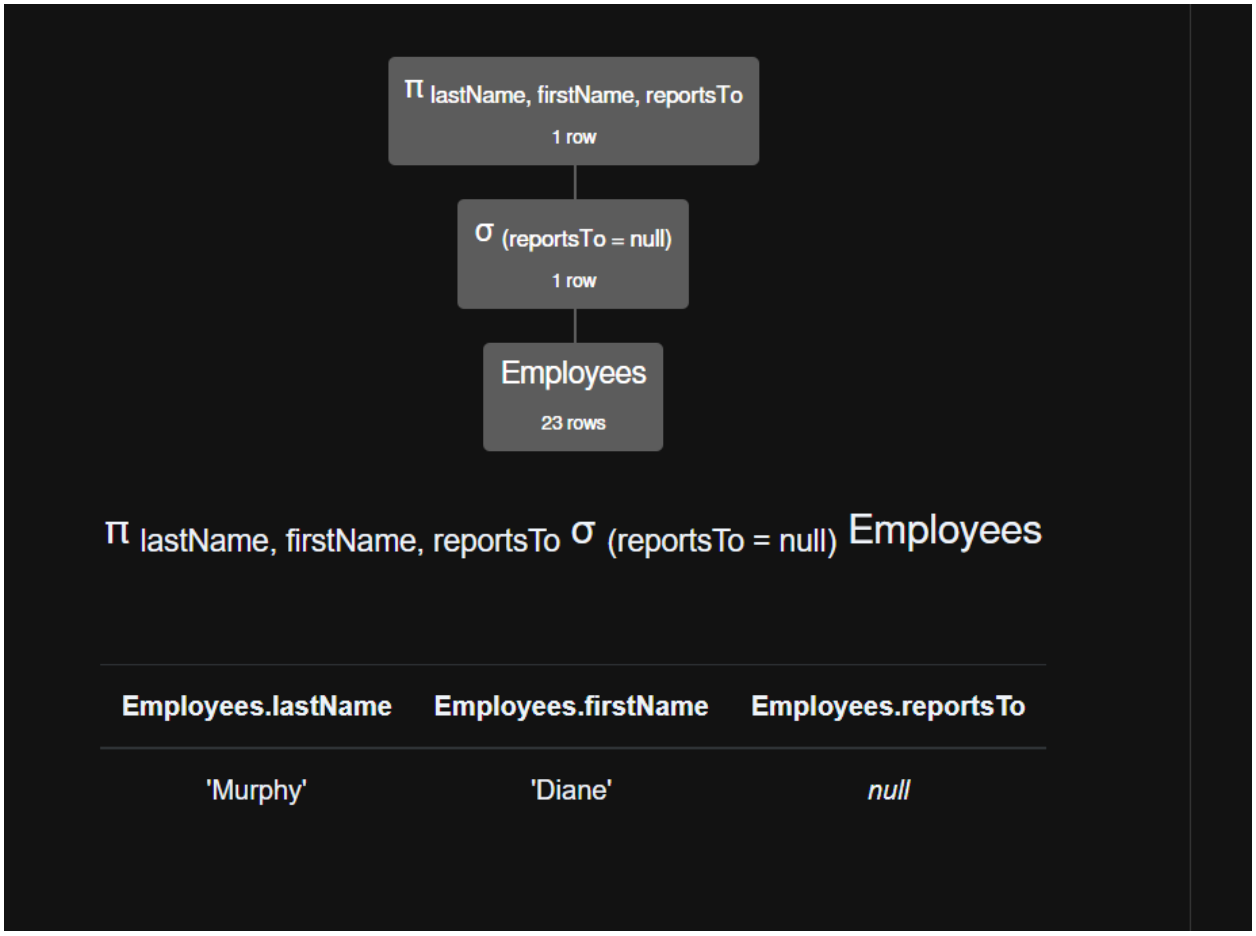
8. List the Employee lastName, firstName, that employee's supervisor's lastName and firstName for those employees whose manager does not report to anyone.

π lastName, firstName, reportsTo
σ (reportsTo = null) Employees



9. List the Product productCode and productName for each product for which we do not have any orders whose quantityOrdered exceeds the quantityInStock for that product.

π products.productCode, products.productName
σ quantityOrdered ≤ quantityInStock
(OrderDetails ⋈ OrderDetails.productCode = products.productCode products)



10. List all the states and countries that we are involved in. If the state has a customer in it, but no office, then list that state name in one column and

"Customer" in the other. If that state has an office with no customers, then list that state in one column and "Office" in the other. Finally, if the state has one or more customer and one or more office, list that state as "Both". List each state just once. Order by the state name. Be sure to consider that the state name could be null in some cases.

boolean = π state
σ(state ≠ null) customers
noob = π state
σ(state ≠ null) Offices
booleanStandard = π state, 'Customer'→ Content (boolean - noob)
booleanMaster = π state, 'Office'→ Content (noob - boolean)
booleanPro = π state, 'Both'→ Content (boolean ∩ noob)
booleanLegend = π state, Content
(booleanStandard ∪ booleanMaster ∪ booleanPro)

τ state booleanLegend