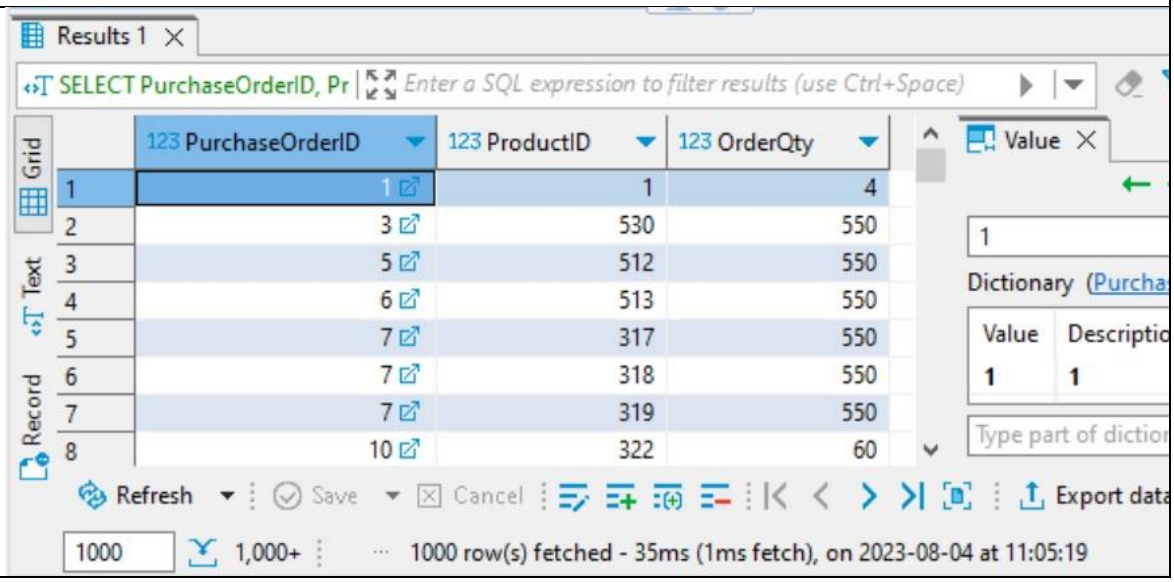
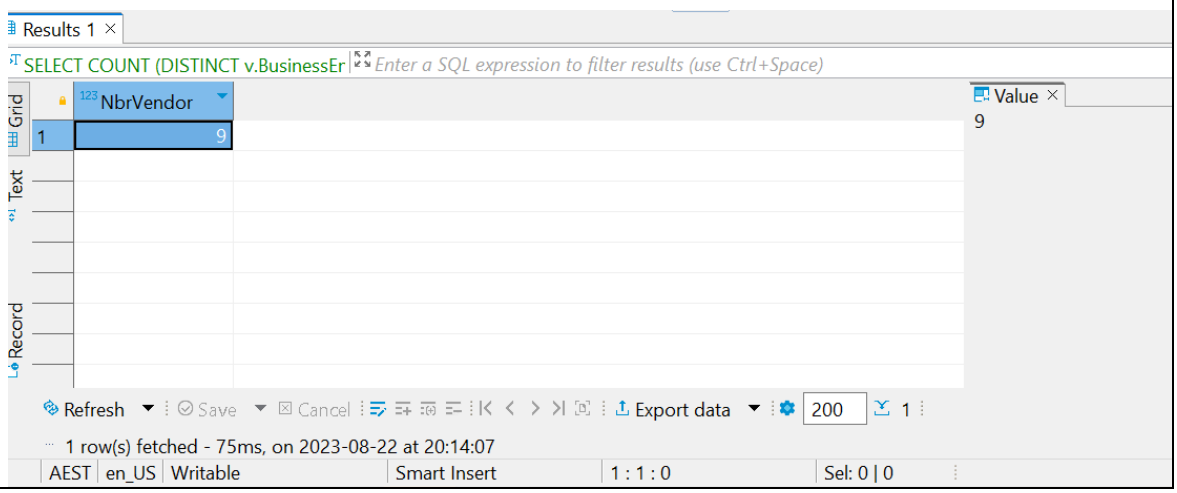
Data Wrangling and R

Using SQL for Business Insights

2.2.1. Display the orders that have an order quantity greater than 3.

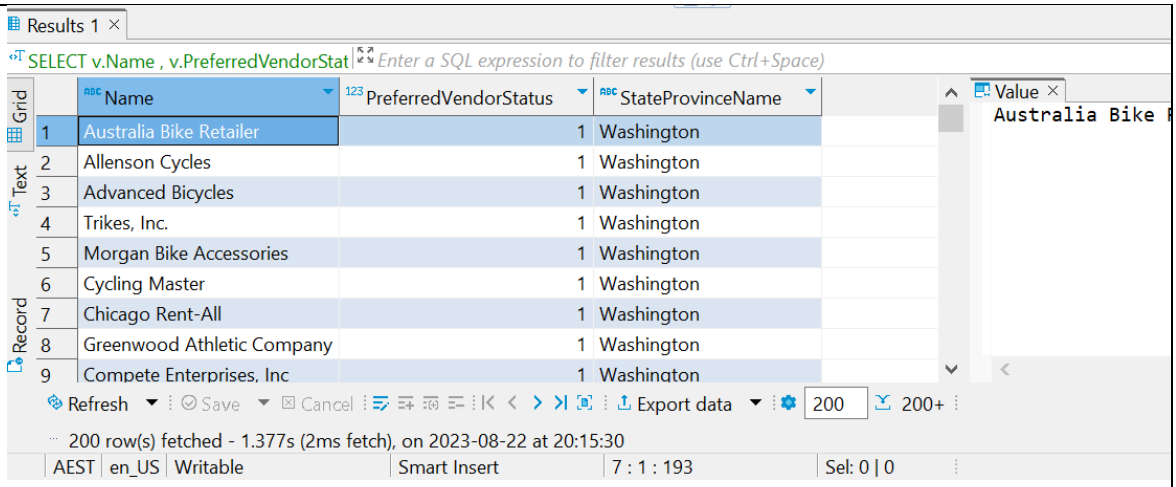
Code	**SELECT** pod.PurchaseOrderID, pod.ProductID , pod.OrderQty **FROM** Purchasing.PurchaseOrderDetail pod **WHERE** pod.OrderQty > 3
Returned table	

2.2.2. Querying Vendor Orders: Counting Vendors with Credit Ratings Above 2

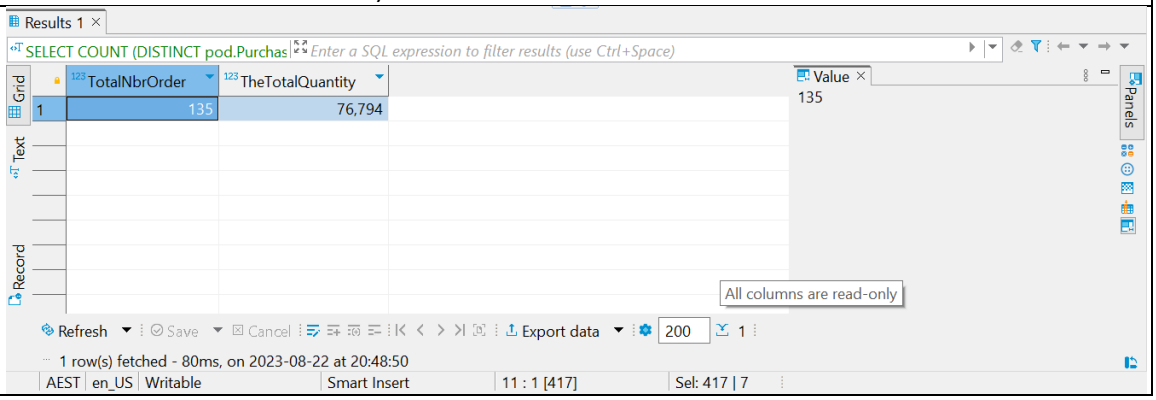
Code	**SELECT COUNT** (**DISTINCT** v.BusinessEntityID) **as** NbrVendor **FROM** Purchasing.Vendor v **JOIN** Purchasing.PurchaseOrderHeader poh **on** v.BusinessEntityID = poh.VendorID **WHERE** v.CreditRating > 2
Returned table	

2.2.3. Display names of vendors and their preferred status of vendors who live in Washington province.

Code	**SELECT** v.Name , v.PreferredVendorStatus, vvwa.StateProvinceName **FROM** Purchasing.Vendor v, Purchasing.vVendorWithAddresses vvwa **WHERE** vvwa.StateProvinceName = 'Washington'

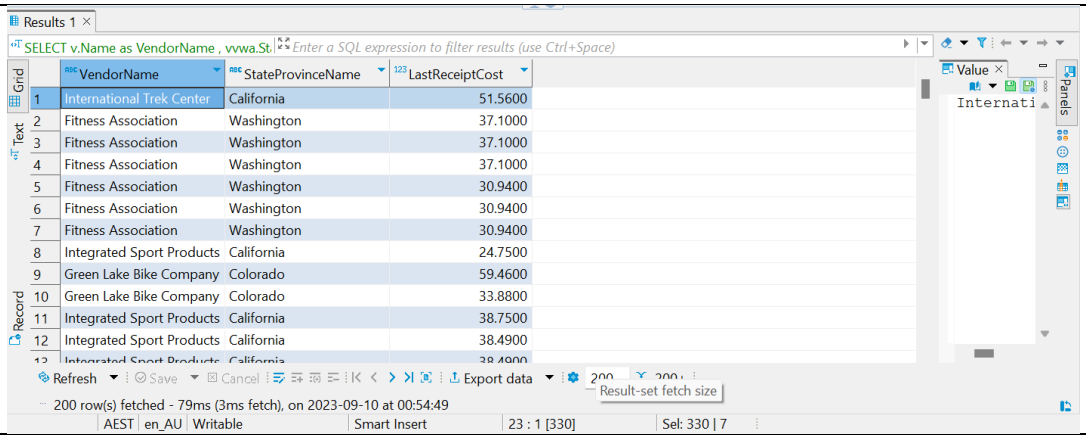
Returned table	

2.2.4. Distinct 2012 Orders Shipped by 'Truck' or 'Cargo Ship': Count and Total Quantity

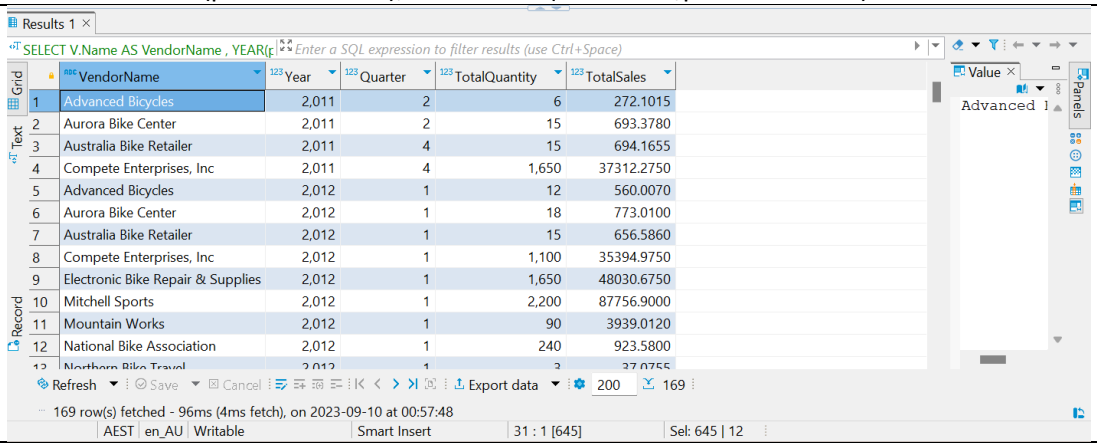
Code	**SELECT COUNT** (**DISTINCT** pod.PurchaseOrderID) **as** TotalNbrOrder, **SUM**(pod.OrderQty) **as** TheTotalQuantity **FROM** Purchasing.PurchaseOrderHeader poh **JOIN** Purchasing.ShipMethod sm **on** sm.ShipMethodID = poh.ShipMethodID **JOIN** Purchasing.PurchaseOrderDetail pod **on** pod.PurchaseOrderID = poh.PurchaseOrderID **WHERE** (sm.Name **LIKE** '%truck%' **or** sm.Name **LIKE** '%cargo%') **AND** (poh.OrderDate **BETWEEN** '2012-01-01' **AND** '2012-12-31')
Returned table	

2.2.5. Display vendors name, state and its latest receipt cost in descending order of both standard price and average lead times.

Code	**SELECT** v.Name **as** VendorName , vvwa.StateProvinceName , pv.LastReceiptCost **FROM** Purchasing.Vendor v **JOIN** Purchasing.vVendorWithAddresses vvwa **on** v.BusinessEntityID = vvwa.BusinessEntityID **JOIN** Purchasing.ProductVendor pv **on** pv.BusinessEntityID = v.BusinessEntityID **ORDER BY** pv.AverageLeadTime **DESC**, pv.StandardPrice **DESC**

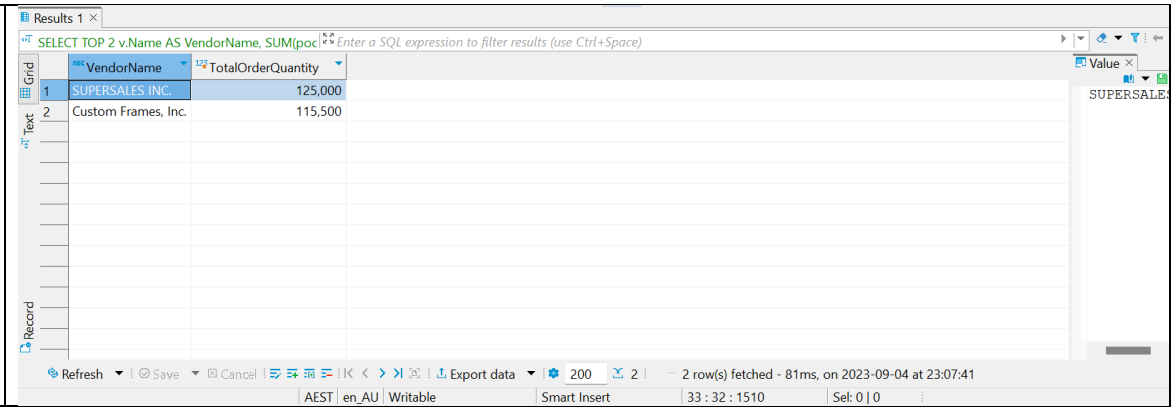
Returned table	

2.2.6. Calculate the quarter sales of vendors in Washington province.

Code	**SELECT** V.Name **AS** VendorName , **YEAR**(poh.OrderDate) **AS** 'Year', **DATEPART**(**QUARTER**,poh.OrderDate) **AS** 'Quarter', **SUM**(pod.OrderQty) **as** TotalQuantity, **SUM**(pod.LineTotal) **AS** TotalSales **FROM** Purchasing.PurchaseOrderHeader poh **JOIN** Purchasing.PurchaseOrderDetail pod **ON** pod.PurchaseOrderID = poh.PurchaseOrderID **JOIN** Purchasing.Vendor v **ON** v.BusinessEntityID = poh.VendorID **JOIN** Purchasing.vVendorWithAddresses vvwa **ON** vvwa.BusinessEntityID = v.BusinessEntityID **WHERE** vvwa.StateProvinceName ='Washington' **GROUP BY** v.Name, **YEAR**(poh.OrderDate), **DATEPART**(**QUARTER**,poh.Orderdate) **ORDER BY YEAR**(poh.Orderdate), **DATEPART** (**QUARTER**,poh.Orderdate)
Returned table	

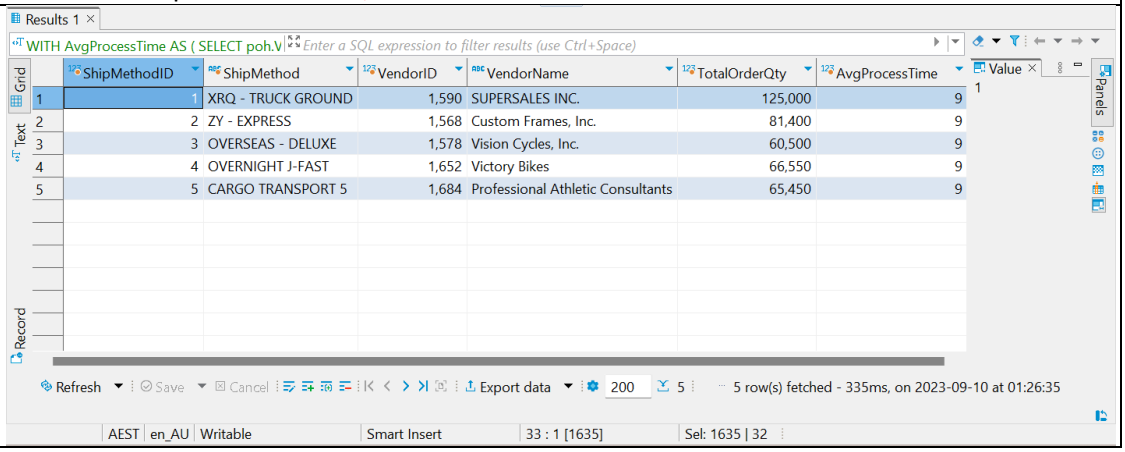
2.2.7. Top Two Vendors by Order Quantity

Code	**SELECT TOP** 2 v.Name **AS** VendorName, **SUM**(pod.OrderQty) **AS** TotalOrderQuantity **FROM** Purchasing.PurchaseOrderHeader poh **JOIN** Purchasing.PurchaseOrderDetail pod **ON** pod.PurchaseOrderID = poh.PurchaseOrderID **JOIN** Purchasing.Vendor v **ON** v.BusinessEntityID = poh.VendorID **GROUP BY** v.Name **ORDER BY sum**(pod.OrderQty) **DESC**

Returned table	

2.2.8. Identifying the Best Vendors by Shipping Type: Criteria Proposal, Justification, and SQL Solution for Optimized Order Processing

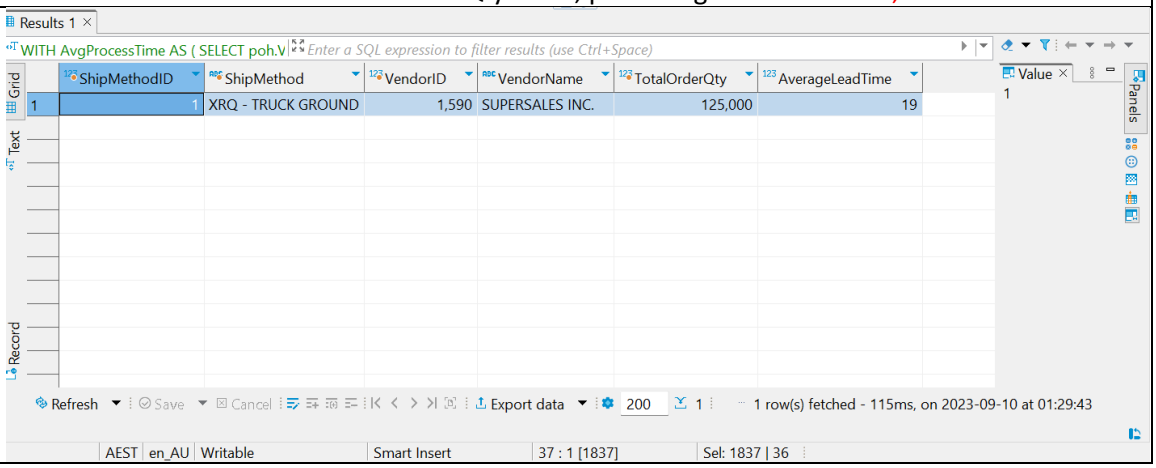
Proposed criterion	Select the top five vendors for the five shipping methods based on highest order quantity processed in the lowest average processing time.
Justification	The vendors are selected by the highest order quantity handled for each shipping type. This guarantees that the vendors with the highest sales volume are prioritized. Minimum average processing time is an important variable in determining order fulfillment efficiency. The goal is to determine the top five suppliers for every delivery method who not only handle a large volume of orders but also finish the deal in the shortest period of time, showing effectiveness in their operations. It will help to increase the company's sales and reputation.
Code	**WITH** AvgProcessTime **AS** (**SELECT** poh.VendorID, **AVG**(**DATEDIFF**(**DAY**, poh.OrderDate, poh.ShipDate)) **AS** AvgProcessTime, sm.ShipMethodID **FROM** Purchasing.PurchaseOrderHeader poh **JOIN** Purchasing.ShipMethod sm **ON** poh.ShipMethodID = sm.ShipMethodID **JOIN** Purchasing.PurchaseOrderDetail pod **ON** poh.PurchaseOrderID = pod.PurchaseOrderID **GROUP BY** poh.VendorID, sm.ShipMethodID), TotalOrderQuantity **AS** (**SELECT** poh.VendorID **as** VendorId, poh.ShipMethodID **as** ShipMethodID, sm.Name **as** ShipMethod, **SUM**(pod.OrderQty) **AS** TotalOrderQty **FROM** Purchasing.PurchaseOrderDetail pod **JOIN** Purchasing.PurchaseOrderHeader poh **ON** poh.PurchaseOrderID = pod.PurchaseOrderID **JOIN** Purchasing.ShipMethod sm **ON** sm.ShipMethodID = poh.ShipMethodID **GROUP BY** poh.VendorID, poh.ShipMethodID, sm.Name), RankedVendors **AS** (**SELECT** TotalOrderQuantity.ShipMethodID **AS** ShipMethodID,TotalOrderQuantity.ShipMethod, TotalOrderQuantity.VendorID **AS** VendorID, TotalOrderQuantity.TotalOrderQty **AS** TotalOrderQty, AvgProcessTime.AvgProcessTime **AS** AvgProcessTime, **ROW_NUMBER**() **OVER** (**PARTITION BY** TotalOrderQuantity.ShipMethodID **ORDER BY** TotalOrderQuantity.TotalOrderQty **DESC**) **AS Rank** **FROM** TotalOrderQuantity **JOIN** AvgProcessTime **ON** TotalOrderQuantity.VendorID = AvgProcessTime.VendorID **AND** TotalOrderQuantity.ShipMethodID = AvgProcessTime.ShipMethodID) **SELECT** RankedVendors.ShipMethodID, RankedVendors.ShipMethod, RankedVendors.VendorID, v.Name **AS** VendorName,

	RankedVendors.TotalOrderQty, RankedVendors.AvgProcessTime **FROM** RankedVendors **JOIN** Purchasing.Vendor v **ON** RankedVendors.VendorID = v.BusinessEntityID **WHERE Rank** = 1 **ORDER BY** ShipMethodID **ASC;**
Returned table	

	ShipMethodID	ShipMethod	VendorID	VendorName	TotalOrderQty	AvgProcessTime
1	1	XRQ - TRUCK GROUND	1,590	SUPERSALES INC.	125,000	9
2	2	ZY - EXPRESS	1,568	Custom Frames, Inc.	81,400	9
3	3	OVERSEAS - DELUXE	1,578	Vision Cycles, Inc.	60,500	9
4	4	OVERNIGHT J-FAST	1,652	Victory Bikes	66,550	9
5	5	CARGO TRANSPORT 5	1,684	Professional Athletic Consultants	65,450	9

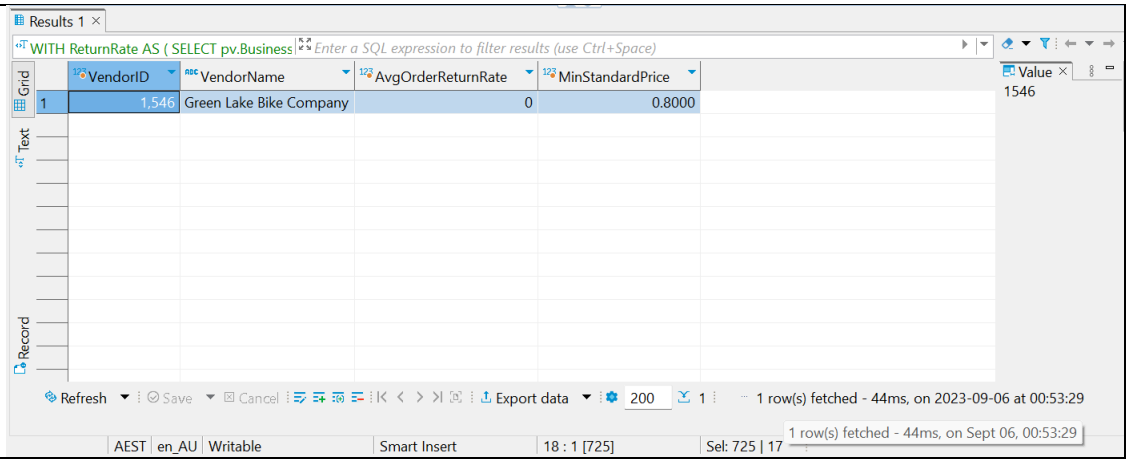
2.2.9. Display the vendor that have sold the highest orders and lowest lead time that is the best vendor.

Code	**WITH** AvgProcessTime **AS** (**SELECT** poh.VendorID, **AVG**(**DATEDIFF**(**DAY**, poh.OrderDate, poh.ShipDate)) **AS** AvgProcessTime, sm.ShipMethodID **FROM** Purchasing.PurchaseOrderHeader poh **JOIN** Purchasing.ShipMethod sm **ON** poh.ShipMethodID = sm.ShipMethodID **JOIN** Purchasing.PurchaseOrderDetail pod **ON** poh.PurchaseOrderID = pod.PurchaseOrderID **GROUP BY** poh.VendorID, sm.ShipMethodID), TotalOrderQuantity **AS** (**SELECT** poh.VendorID **as** VendorId, poh.ShipMethodID **as** ShipMethodID, sm.Name **as** ShipMethod, **SUM**(pod.OrderQty) **AS** TotalOrderQty **FROM** Purchasing.PurchaseOrderDetail pod **JOIN** Purchasing.PurchaseOrderHeader poh **ON** poh.PurchaseOrderID = pod.PurchaseOrderID **JOIN** Purchasing.ShipMethod sm **ON** sm.ShipMethodID = poh.ShipMethodID **GROUP BY** poh.VendorID, poh.ShipMethodID, sm.Name), RankedVendors **AS** (**SELECT** TotalOrderQuantity.ShipMethodID **AS** ShipMethodID,TotalOrderQuantity.ShipMethod, TotalOrderQuantity.VendorID **AS** VendorID, TotalOrderQuantity.TotalOrderQty **AS** TotalOrderQty, AvgProcessTime.AvgProcessTime **AS** AvgProcessTime, **ROW_NUMBER**() **OVER** (**PARTITION BY** TotalOrderQuantity.ShipMethodID **ORDER BY** TotalOrderQuantity.TotalOrderQty **DESC**) **AS Rank** **FROM** TotalOrderQuantity **JOIN** AvgProcessTime **ON** TotalOrderQuantity.VendorID = AvgProcessTime.VendorID **AND** TotalOrderQuantity.ShipMethodID = AvgProcessTime.ShipMethodID) **SELECT TOP** 1 RankedVendors.ShipMethodID **as** ShipMethodID,RankedVendors.ShipMethod, RankedVendors.VendorID, v.Name **AS** VendorName, RankedVendors.TotalOrderQty, pv.AverageLeadTime **FROM** RankedVendors **JOIN** Purchasing.Vendor v **ON** RankedVendors.VendorID = v.BusinessEntityID

	JOIN Purchasing.ProductVendor pv **ON** RankedVendors.VendorID = pv.BusinessEntityID **JOIN** Purchasing.ShipMethod sm **ON** sm.ShipMethodID = RankedVendors.ShipMethodID **ORDER BY** RankedVendors.TotalOrderQty **DESC**, pv.AverageLeadTime **ASC**;
Returned table	

2.2.10. Finding the Most Efficient and Cost-Effective Vendor: Criteria Definition and SQL Solution for Optimal Selection

Proposed criterion	Select the best vendor that has the smallest order return rate and the cheapest standard price.
Justification	Low return rates tend to be indicative of great product quality, customer happiness, and efficient customer service. The Lower standard cost might make a vendor more appealing to clients and contribute to their market competitiveness. The goal is to choose a vendor who not only has a solid track record of reducing order returns but also offers affordable pricing. When it comes to quality and pricing, this vendor is likely to be the greatest choice for the organization.
Code	**WITH** ReturnRate **AS** (**SELECT** pv.BusinessEntityID **AS** VendorID, **AVG**(pod.RejectedQty / pod.OrderQty) **AS** AvgOrderReturnRate **FROM** Purchasing.ProductVendor pv **JOIN** Purchasing.PurchaseOrderDetail pod **ON** pv.ProductID = pod.ProductID **GROUP BY** pv.BusinessEntityID), VendorCheapestPrice **AS** (**SELECT** pv.BusinessEntityID **AS** VendorID, **MIN**(pv.StandardPrice) **AS** MinStandardPrice **FROM** Purchasing.ProductVendor pv **GROUP BY** pv.BusinessEntityID) **SELECT TOP** 1 a.VendorID, v.Name **AS** VendorName, a.AvgOrderReturnRate, b.MinStandardPrice **FROM** ReturnRate a **JOIN** VendorCheapestPrice b **ON** a.VendorID = b.VendorID **JOIN** Purchasing.Vendor v **ON** b.VendorID = v.BusinessEntityID **ORDER BY** a.AvgOrderReturnRate **ASC**, b.MinStandardPrice **ASC**;

Returned table	

2.2.11. Calculate the average order fulfillment cost and time

Code	**WITH** ReturnRate **AS** (**SELECT** pv.BusinessEntityID **AS** VendorID, **AVG**(pod.RejectedQty / pod.OrderQty) **AS** AvgOrderReturnRate **FROM** Purchasing.ProductVendor pv **JOIN** Purchasing.PurchaseOrderDetail pod **ON** pv.ProductID = pod.ProductID **GROUP BY** pv.BusinessEntityID), VendorCheapestPrice **AS** (**SELECT** pv.BusinessEntityID **AS** VendorID, **MIN**(pv.StandardPrice) **AS** MinStandardPrice **FROM** Purchasing.ProductVendor pv **GROUP BY** pv.BusinessEntityID), MostEffectiveVendor **AS** (**SELECT TOP** 1 a.VendorID **FROM** ReturnRate a **JOIN** VendorCheapestPrice b **ON** a.VendorID = b.VendorID **ORDER BY** a.AvgOrderReturnRate **ASC**, b.MinStandardPrice **ASC**), OrderFulfillment **AS** (**SELECT AVG**(po.Freight + po.TaxAmt) **AS** AvgOrderFulfillmentCost, **AVG**(**DATEDIFF**(**day**, po.OrderDate, po.ShipDate)) **AS** AvgOrderFulfillmentTime **FROM** Purchasing.PurchaseOrderHeader po **WHERE** po.VendorID = (**SELECT** VendorID **FROM** MostEffectiveVendor)) **SELECT** OrderFulfillment.AvgOrderFulfillmentTime, AvgOrderFulfillmentCost **FROM** OrderFulfillment;
Returned table