Introduction

The Northwind Traders company specializes on exporting and importing products from around the world. For an annual review of the inner workings of the company, the following departments: Product Team, HR Team, Logistics Team and the Sales Team have decided to conduct an analysis into their data to find the performance of the company. A data analyst was tasked to carry out the analysis.

Presentation of Data

The Northwind Traders database consists of 15 tables which contains information about employees, customers and orders including particulars about order shipments and product types. It contains information about orders from July 1996 to May 1998. The data dictionary for the whole dataset is given below:

Table	Columns	Data Type	Description
Categories	Category_ID	int	Categories of Northwind products.
	Category_Name	varchar	Name of food category.
	Description	text	Full description of the category. Provide samples.
Customers	Customer_ID	varchar	ID of customer
	Company_Name	varchar	Customer's company name
	Contact_Name	varchar	Customer's contact name
	Contact_Title	varchar	Customer's contact title
	Address	varchar	Street or post-office box.
	City	varchar	City in which customer lives in
	Region	varchar	State or province.
	Postal_Code	varchar	Postal code
	Country	varchar	Country in which customer lives in
	Phone	varchar	Phone number includes country code or area code.
	Fax	varchar	Fax number
Customer_customer_demo	Customer_id	bpchar	ID of customer
	customer_type_id	bpchar	Type of customer
Customer_demographics	customer_type_id	bpchar	Type of customer
	customer_desc	text	Description of customer
	Employee_ID	varchar	Employee's ID
	Last_Name	varchar	Employee's Last Name
	First_Name	varchar	Employee's First Name
	Title	varchar	Employee's Job title
	Title_Of_Courtesy	varchar	Employee's title of courtesy

Employees	BirthDate	datetime	Employee's Birth date
	HireDate	datetime	Day at which employee got hired
	Address	varchar	Employee's address
	City	varchar	City in which employee lives in
	Region	varchar	State or provice
	Postal_Code	varchar	Postal code
	Country	varchar	Country
	Home_Phone	varchar	Phone number includes country code or area code.
	Extension	varchar	Internal telephone extension number.
	Notes	Text	General information about employee's background.
	ReportsTo	Int	Employee's supervisor.
Employee_Territories	Employee_ID	int	ID of employee
	Territory_ID	varchar	ID of territory
Order_Details	Order_ID	int	ID of order
	Product_ID	int	ID of product
	Unit_Price	decimal	Unit price of product
	Quantity	smallint	Quantity of products sold
	Discount	decimal	Discount percentage applied on order
Orders	Order_ID	int	ID of order
	Customer_ID	varchar	Customer's ID
	Employee_ID	int	Employee's ID
	Order_Date	datetime	Date in which order was placed
	Required_Date	datetime	
	Shipped_Date	datetime	Date in which order was shipped
	Ship_Via	int	Same as Shipper ID in Shippers table.
	Freight	decimal	freight
	Ship_Name	varchar	Name of person or company to receive the shipment.
	Ship_Address	varchar	Street address only -- no post-office box allowed.
	Ship_City	varchar	City in which the shipment is going to be received
	Ship_Region	varchar	State or province
	Ship_Postal_Code	varchar	Postal Code

	Ship_Country	varchar	Country in which the shipment is going to be received
Products	Product_ID	Int	ID of product
	Product_Name	varchar	Product's name
	Supplier_ID	Int	ID of supplier
	Category_ID	Int	ID of category
	Quantity_Per_Unit	nvarchar	(e.g., 24-count case, 1-liter bottle).
	UnitPrice	money	Price of one unit
	Units_In_Stock	Smallint	Units in stock
	Units_On_Order	Smallint	Units on order
	Reorder_Level	smallint	Minimum units to maintain in stock.
	Discontinued	bit	1 = no longer available, 0 = available
Region	Region_ID	int	ID of region
	Region_Description	varchar	Description of region
Shippers	Shipper_ID	Int	Shipper's ID
	Company_Name	varchar	Name of shipping company.
	Phone	varchar	Phone number includes country code or area code.
Suppliers	Supplier_ID	int	ID of supplier
	Company_Name	varchar	Supplier's company name
	Contact_Name	varchar	Supplier's point of contact
	Contact_Title	varchar	Point of contact's job title
	Address	varchar	Supplier's address
	City	varchar	Supplier's city
	Region	varchar	State or province
	Postal_Code	varchar	Postal code
	Country	varchar	Supplier's country
	Phone	varchar	Phone number includes country code or area code.
	Fax	varchar	Fax number
	Home_Page	text	Supplier's home page on World Wide Web.
Territories	Territory_ID	varchar	ID of territory
	Territory_Description	varchar	Description of territory
	Region_ID	int	ID of region
Shippers_tmp	Shipper_id	Int	Shipper's ID
	Company_name	varchar	Name of shipping company.
	phone	varchar	Phone number includes country code or area code.
	state_id	int	ID of state

us_states	state_name	varchar	State's name
	state_abbr	varchar	State's abbreviation
	state_region	varchar	Region of state

Instructions to create and connect to the database

All the tables mentioned in the data dictionary above can be accessed by creating and connecting to the database. To create and connect to the database, please follow the following instructions:

Pre-requisites:

- Install Postgres
- Install Dbeaver

Create and connect to database:

- Download a sql file from: https://drive.google.com/file/d/1xfUF79LxsYte9Wevce-Fhpw50uiS_0Jx/view that contains code to create the database and populate the tables
- Open dbeaver
- Create a new connection using PostgreSQL
- Put the following credentials while creating the connection:
  - Host: localhost
  - Database: postgres
  - Password: [Put your own database password that you setup while installing postgres]
  - Port: 5432
- Click on Test Connection
- Once the connection has been successful, run the downloaded sql file
- Check if the tables has been populated in the public schema

Business Questions

List of products with unit price between $10 and $50

As part of the annual review of the company pricing strategy, the product team wanted to look at a list of products within a particular price range (between $10 and $50).

The table on the following page shows all the products that are still available and have not been discontinued with unit price between $10 and $50. There are a total of 77 products in our database, out of which 10 has been discontinued. Of the 67 remaining products, 52 of them are between the price range of $10 and $50. All these products are listed in the table on the following table and can be further analysed to improve the company's pricing strategy.

product_name	product_unit_price
Aniseed Syrup	10
Boston Crab Meat	18.4
Camembert Pierrot	34
Chartreuse verte	18
Chef Anton's Cajun Seasoning	22
Chocolade	12.75
Escargots de Bourgogne	13.25
Flotemysost	21.5
Genen Shouyu	13
Gnocchi di nonna Alice	38
Gorgonzola Telino	12.5
Grandma's Boysenberry Spread	25
Gravad lax	26
Gudbrandsdalsost	36
Gula Malacca	19.45
Gumb√§r Gummib√§rchen	31.23
Gustaf's Kn√§ckebr√∂d	21
Ikura	31
Inlagd Sill	19
Ipoh Coffee	46
Lakkalik√∂√∂ri	18
Laughing Lumberjack Lager	14
Longlife Tofu	10
Louisiana Fiery Hot Pepper Sauce	21.05
Louisiana Hot Spiced Okra	17
Mascarpone Fabioli	32
Maxilaku	20
Mozzarella di Giovanni	34.8
Nord-Ost Matjeshering	25.89
Northwoods Cranberry Sauce	40
NuNuCa Nu√ü-Nougat-Creme	14
Original Frankfurter gr√ºne So√üe	13
Outback Lager	15
Pavlova	17.45
P√¢t√© chinois	24
Queso Cabrales	21
Queso Manchego La Pastora	38
Ravioli Angelo	19.5
R√∂d Kaviar	15
Sasquatch Ale	14
Schoggi Schokolade	43.9
Scottish Longbreads	12.5
Sir Rodney's Scones	10
Sirop d'√©rable	28.5
Spegesild	12
Steeleye Stout	18
Tarte au sucre	49.3
Tofu	23.25
Uncle Bob's Organic Dried Pears	30
Valkoinen suklaa	16.25
Vegie-spread	43.9
Wimmers gute Semmelkn√∂del	33.25

Retrospection of shipping country's performances for the year 1997

The performance of the shipping countries for the year 1997 was analysed by finding out the average days between order date and the shipping date and the total volume of orders for each country. The result was filtered to exclude average days between order date and shipping date of less than 3 days and those with more than or equal to 20 days. Additionally, countries with less than or equal to 5 orders were excluded as well. The following table shows the 18 countries with their average days between order shipping and their total volume or orders that satisfy the above-mentioned conditions.

| shipping_country	average_days_between_order_shipping	total_volume_orders
Portugal	13	7
USA	11.98	60
Austria	11.67	21
UK	11.47	30
Germany	10.56	64
Ireland	10.1	10
Brazil	9.95	42
Venezuela	9.75	20
Italy	9.13	15
Mexico	9.08	12
Denmark	8.91	11
Belgium	8.29	7
France	8.26	39
Sweden	7.65	17
Switzerland	7.63	8
Canada	7.41	17
Argentina	6.67	6
Finland	6.54	13
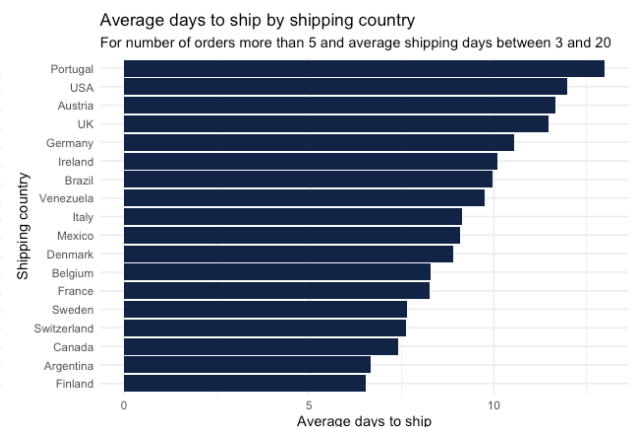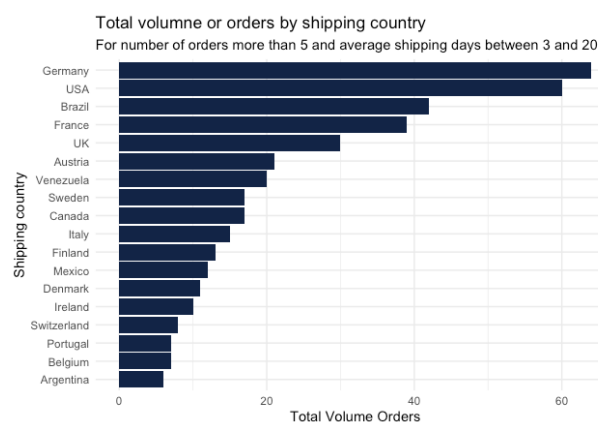
As can be seen from the bar plots, USA is one of those countries that have a large volume of orders and takes lot of days to ship a product. So, we should probably concentrate on improving the shipping process from USA. Additionally, even though Portugal does not have a large volume of orders, but it still takes a lot of time to ship. So, the shipping process in Portugal needs to be investigated as well.

Employee information for the HR Team

A complete list of employees was curated with their full name, job title, employee's age at the time they were hired, their tenure in the company, their manager's full name and the manager's job title. This would give the HR team a complete idea about which employee has been working for how long in the company and who they report to.

employee_full_name	employee_title	employee_age	employee_tenure	manager_full_name	manager_title
Anne Dodsworth	Sales Representative	28	27	Steven Buchanan	Sales Manager
Janet Leverling	Sales Representative	28	30	Andrew Fuller	Vice President, Sales
Michael Suyama	Sales Representative	30	28	Steven Buchanan	Sales Manager
Robert King	Sales Representative	33	28	Steven Buchanan	Sales Manager
Laura Callahan	Inside Sales Coordinator	36	28	Andrew Fuller	Vice President, Sales
Steven Buchanan	Sales Manager	38	28	Andrew Fuller	Vice President, Sales
Andrew Fuller	Vice President, Sales	40	30		
Nancy Davolio	Sales Representative	43	30	Andrew Fuller	Vice President, Sales
Margaret Peacock	Sales Representative	55	29	Andrew Fuller	Vice President, Sales

The table shows that Laura Callahan, Steven Buchanan, Nancy Davalio, Margaret Peacock and Janet Leverling all report to Andrew Fuller, who is the Vice President of Sales. In contrast, Anne Dodsworth, Michael Suyama and Robert King report to Steven Buchanan, who is the Sales Manager.
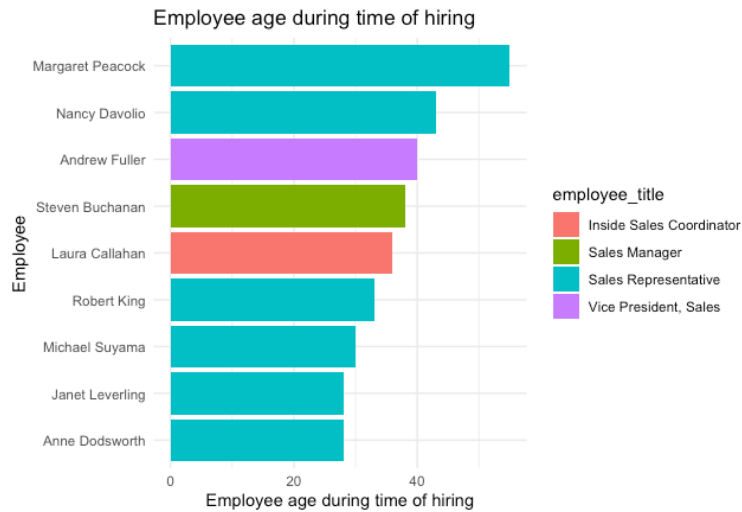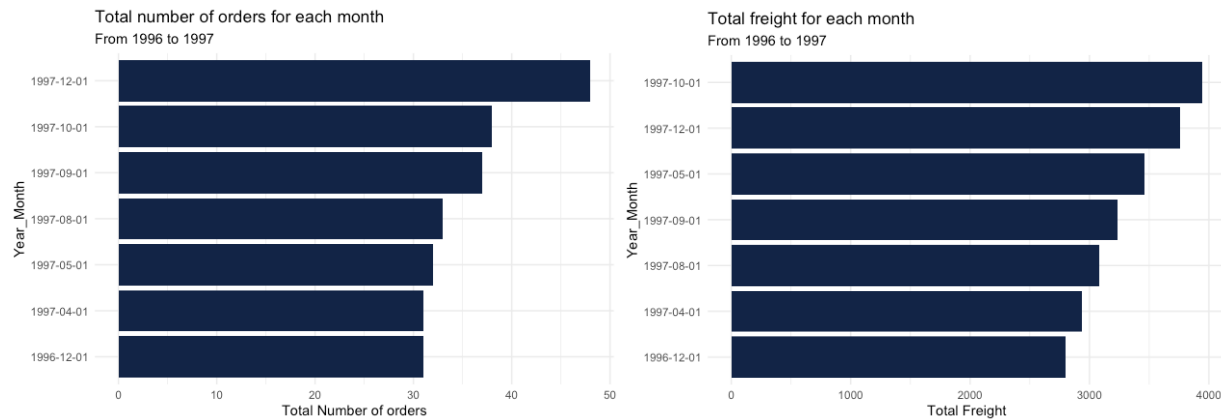

As can be seen from the bar plot, Sales Representatives are usually hired of all ages whereas employees who go on to become managers or vice president are usually hired when they are in their mid 30s or 40s.

Retrospection of Logistics teams' monthly global performance over the period 1996-1997

The monthly global performance of Logistics team over the period of 1996-1997 was analysed by finding out the total number of orders and total freight for each month. The result was filtered to only include those months that had orders more than 20 and their total freight was more than 2500.

year_month	total_number_orders	total_freight
1/10/1997	38	3946
1/12/1997	48	3758
1/5/1997	32	3461
1/9/1997	37	3237
1/8/1997	33	3078
1/4/1997	31	2939
1/12/1996	31	2799

Total number of orders for each month
From 1996 to 1997

Total freight for each month
From 1996 to 1997

As can be seen from the bar plots and the table, December 1997 and October 1997 were 2 of the highest performing months in terms of total number of orders and freight. Both of those months had orders more than 35 and total freight more than 3500.

Products with a percentage increase in price that is not between 10% and 30%

The Pricing team wanted to know which products had irregular price increases over the period of 1996-1997. To do that, the data was analysed to find those products that had a percentage increase in unit price less than 10% or greater than 30%

| product_name	current_unit_price	previous_unit_price	percentage_increase
Mozzarella di Giovanni	34.8	34.8	0
Genen Shouyu	13	12.4	4.8387
Singaporean Hokkien Fried Mee	14	9.8	42.8571
Queso Cabrales	21	14	50
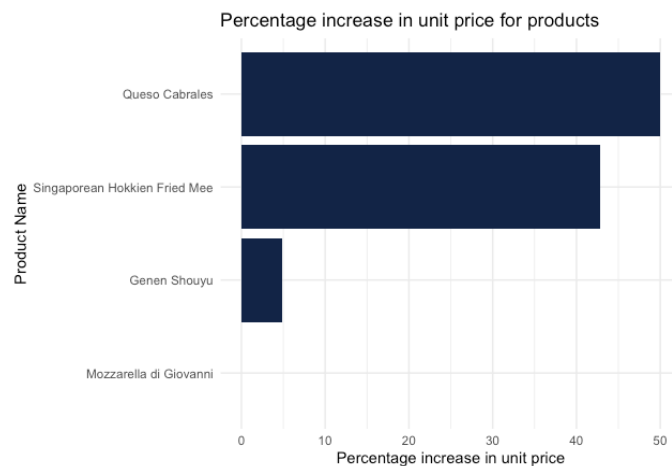
As can be seen from the bar plot and table, Mozzarella di Giovanni had no price increase whereas Singaporean Hokkien Fried Mee and Queso Cabrales had a very high percentage increase in their unit prices. In contrast, 71 out of 77 products had an approximate unit price increase of 25%, which means that the percentage increase in the unit price of the products shown in the table is very unusual. This needs to be investigated further to determine as to why these products had these unusual price changes.

Performance of each category of product according to their price range

The Pricing team wanted to find out how each category performs according to their price range. To determine that, the data was analysed to find out the total sales amount taking into consideration the discount offered and the total number of orders for each category and their price range.

category_name	price_range	total_amount	total_number_orders
Beverages	1. Below $10	550.15	94
Beverages	2. $10 - $20	4131.4	238
Beverages	3. $20 - $50	1203.8	28
Beverages	4. Over $50	5901.3	24
Condiments	1. Below $10	23.9	3
Condiments	2. $10 - $20	1604.65	99
Condiments	3. $20 - $50	2965.38	100
Confections	1. Below $10	598.9	68
Confections	2. $10 - $20	2201.72	155
Confections	3. $20 - $50	3515.4	87
Confections	4. Over $50	1214.26	16
Dairy Products	1. Below $10	73.1	32
Dairy Products	2. $10 - $20	1081.85	79
Dairy Products	3. $20 - $50	6777.69	201
Dairy Products	4. Over $50	1923.6	35
Grains/Cereals	1. Below $10	371.25	49
Grains/Cereals	2. $10 - $20	834.95	53
Grains/Cereals	3. $20 - $50	2949.22	89
Meat/Poultry	1. Below $10	242.35	36
Meat/Poultry	2. $10 - $20	210	11
Meat/Poultry	3. $20 - $50	2777.4	85
Meat/Poultry	4. Over $50	4176.43	36
Produce	1. Below $10	63.6	8
Produce	2. $10 - $20	216.8	14
Produce	3. $20 - $50	2911.27	82
Produce	4. Over $50	1588.6	30
Seafood	1. Below $10	882.3	109
Seafood	2. $10 - $20	1886.02	116
Seafood	3. $20 - $50	2191.88	76
Seafood	4. Over $50	1310.7	21

Total Number of orders by price range
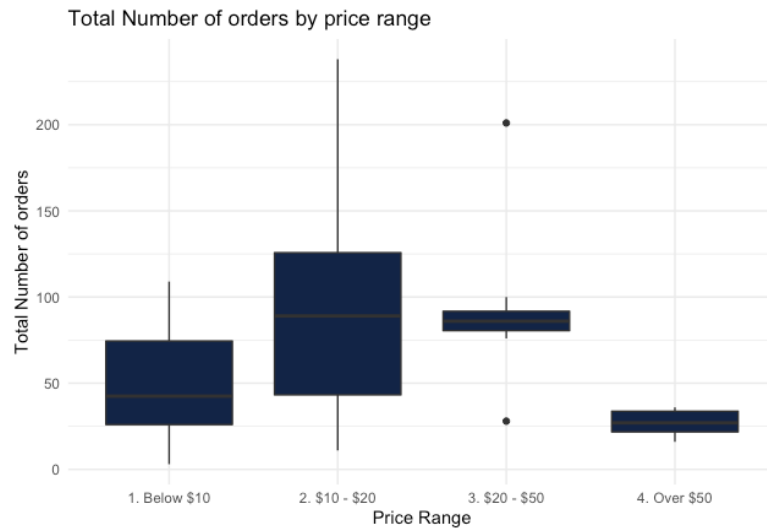
As can be seen from the above box plot, the price range, $20 - $50, has a small range of total number of orders. This indicates that regardless of the category of product, products that fall in the price range, $20 - $50 usually has a relatively high number of orders.

Total Amount by price range for each category
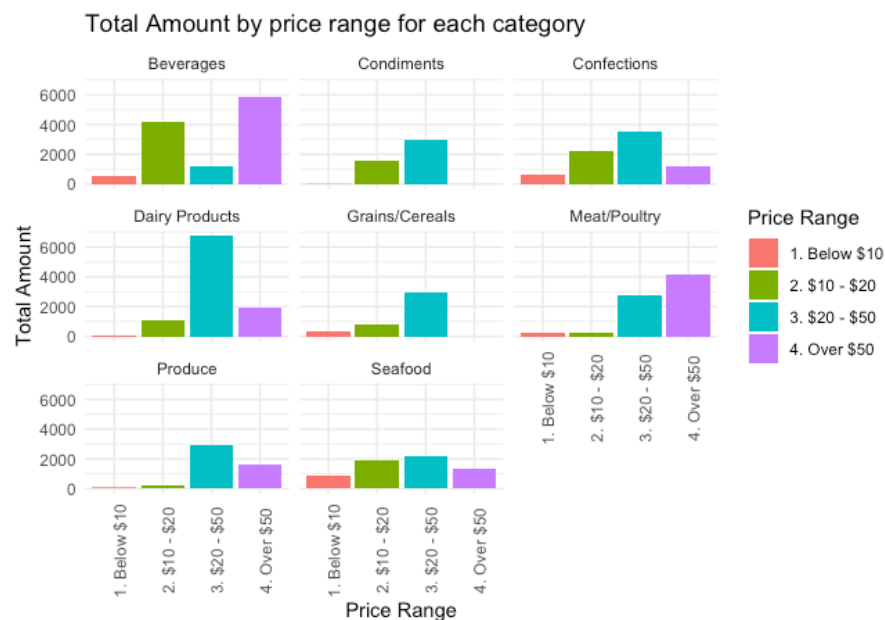
As can be seen from the above bar plot, all the categories except Beverages and Meat/Poultry have the highest total amount in the price range, $20 - $50. This indicates that these categories of products have the most sales when they are priced between $20 and $50. However, in case of Beverages, it seems that the price range, over $50, performs the best. On further inspection, it seems that the total amount for this price range (over $50) has been influenced by one product, Côte de Blaye, which has a unit price of 263.5

Current state of regional suppliers' stocks

The logistics team wanted to find out the state of regional suppliers' stocks. So, to find that out, the data was analysed to determine the total units in stock, total units on order, total reorder level for each category of product and supplier region.

category_name	supplier_region	units_in_stock	units_on_order	reorder_level
Beverages	America	203	0	40
Condiments	America	372	100	70
Confections	America	17	0	0
Meat/Poultry	America	136	0	30
Produce	America	15	0	10
Seafood	America	208	0	40
Beverages	Asia	17	10	25
Condiments	Asia	66	0	20
Grains/Cereals	Asia	26	0	0
Meat/Poultry	Asia	29	0	0
Produce	Asia	39	20	5
Seafood	Asia	55	0	5
Beverages	Europe	324	40	100
Condiments	Europe	45	70	40
Confections	Europe	340	180	155
Dairy Products	Europe	393	140	110
Grains/Cereals	Europe	244	90	130
Meat/Poultry	Europe	0	0	0
Produce	Europe	26	0	0
Seafood	Europe	396	120	100
Beverages	Oceania	15	10	30
Condiments	Oceania	24	0	5
Confections	Oceania	29	0	10
Grains/Cereals	Oceania	38	0	25
Meat/Poultry	Oceania	0	0	0
Produce	Oceania	20	0	10
Seafood	Oceania	42	0	0

Supplier Region by units in stock

Supplier Region by units on order

Supplier Region by reorder level
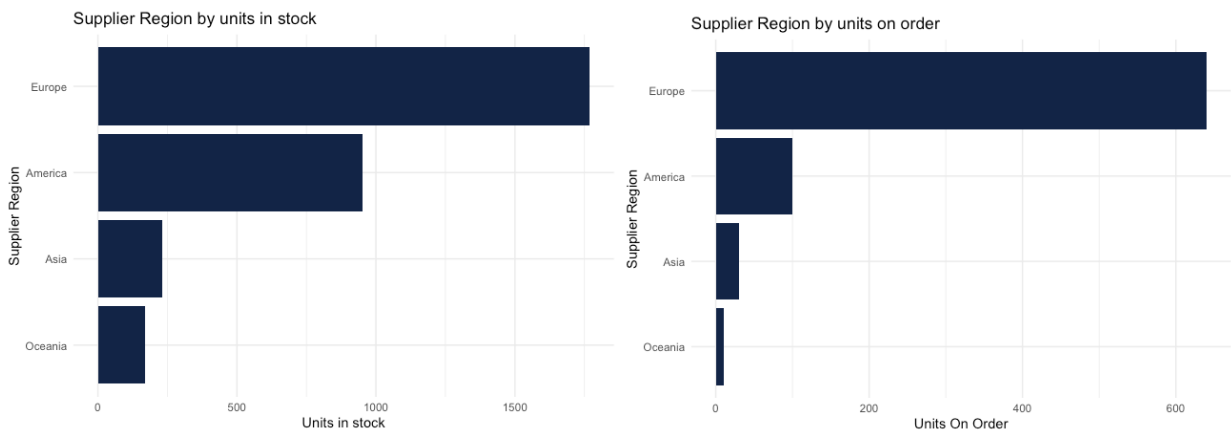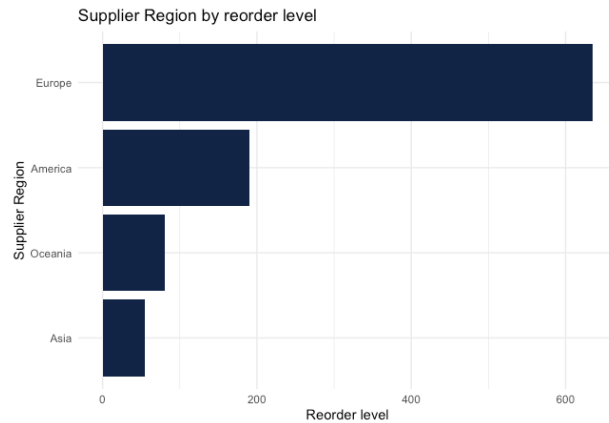
The above bar plots shows that Europe had the most units in stock, units on order and reorder level. This indicates that most of our products comes from Europe.

This is further reinstated if we look at bar plots of units in stock by supplier region for each country.


Units in stock by supplier region for each category

As seen from the above bar plots, 5 out of 8 categories (Beverages, Confections, Dairy Products, Grains/Cereals and Seafood) mostly get their supply from Europe. America is the next big supplier, the biggest supplier of Condiments and Meat/Poultry.

Comparison of a product's unit price against their categories' average and median unit price

The Pricing team wanted to know how each currently offered product's unit price compare against their categories average and median unit price. To answer that question, the following table was prepared displaying the category of product, product name, product's unit price, category's average unit price, category's median unit price, product's unit price position in comparison to the category's average unit price and the product's unit price position in comparison to the category's median unit price.

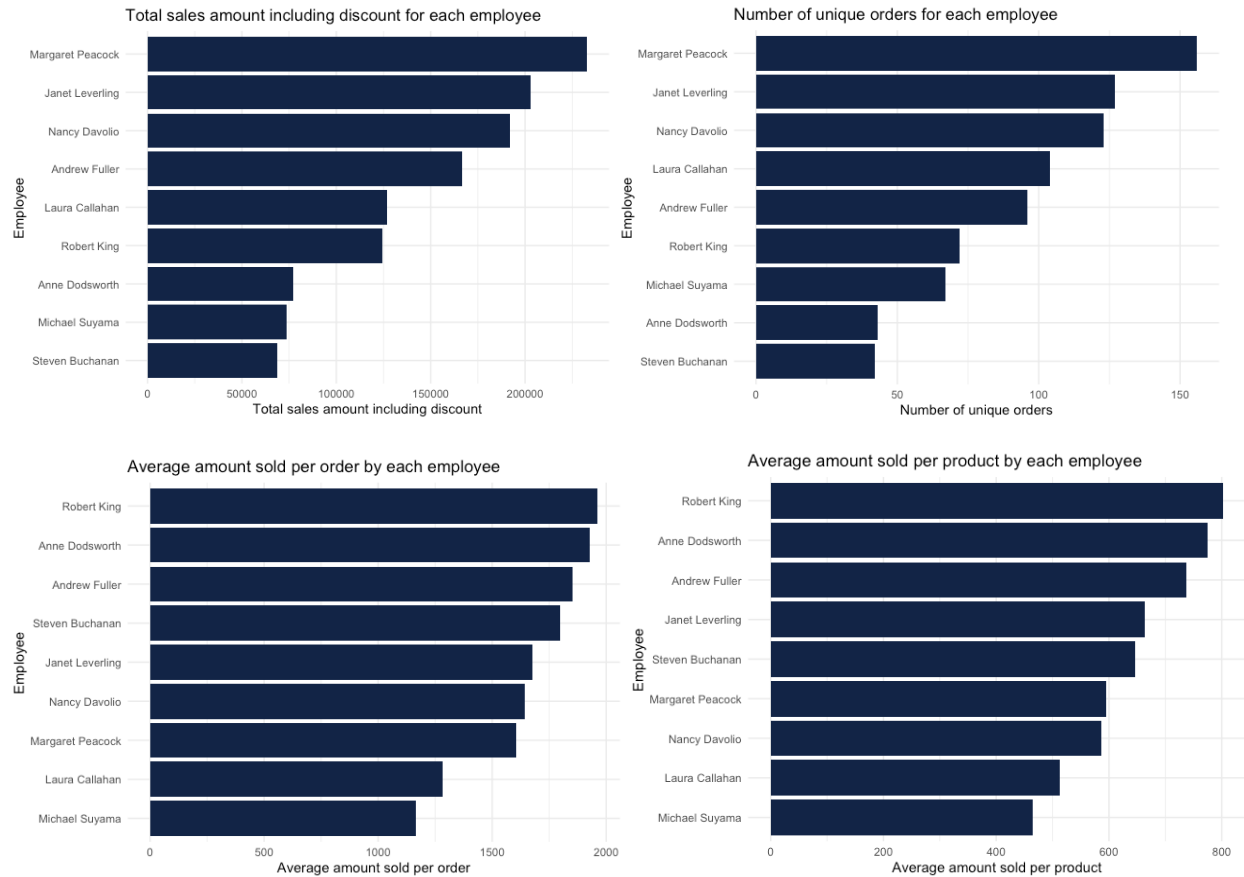| category_name	product_name	unit_price	average_unit_price	median_unit_price	average_unit_price_position	median_unit_price_position
Beverages	Chartreuse verte	18	46.03	18	Below Average	Median
Beverages	CV¥te de Blaye	263.5	46.03	18	Over Average	Over Median
Beverages	Ipoh Coffee	46	46.03	18	Below Average	Over Median
Beverages	Lakkalik√∂√∂ri	18	46.03	18	Below Average	Median
Beverages	Laughing Lumberjack Lager	14	46.03	18	Below Average	Below Median
Beverages	Outback Lager	15	46.03	18	Below Average	Below Median
Beverages	Rh√∂nbr√§u Klosterbier	7.75	46.03	18	Below Average	Below Median
Beverages	Sasquatch Ale	14	46.03	18	Below Average	Below Median
Beverages	Steeleye Stout	18	46.03	18	Below Average	Median
Condiments	Aniseed Syrup	10	22.99	21.05	Below Average	Below Median
Condiments	Chef Anton's Cajun Seasoning	22	22.99	21.05	Below Average	Over Median
Condiments	Genen Shouyu	13	22.99	21.05	Below Average	Below Median
Condiments	Grandma's Boysenberry Spread	25	22.99	21.05	Over Average	Over Median
Condiments	Gula Malacca	19.45	22.99	21.05	Below Average	Below Median
Condiments	Louisiana Fiery Hot Pepper Sauce	21.05	22.99	21.05	Below Average	Below Median
Condiments	Louisiana Hot Spiced Okra	17	22.99	21.05	Below Average	Below Median
Condiments	Northwoods Cranberry Sauce	40	22.99	21.05	Over Average	Over Median
Condiments	Original Frankfurter gr√ºne So√üe	13	22.99	21.05	Below Average	Below Median
Condiments	Sirop d'V©rable	28.5	22.99	21.05	Over Average	Over Median
Condiments	Vegie-spread	43.9	22.99	21.05	Over Average	Over Median
Confections	Chocolade	12.75	25.16	16.25	Below Average	Below Median
Confections	Gumb√§r Gummib√§rchen	31.23	25.16	16.25	Over Average	Over Median
Confections	Maxilaku	20	25.16	16.25	Below Average	Over Median
Confections	NuNuCa Nu√ü-Nougat-Creme	14	25.16	16.25	Below Average	Below Median
Confections	Pavlova	17.45	25.16	16.25	Below Average	Over Median
Confections	Schoggi Schokolade	43.9	25.16	16.25	Over Average	Over Median
Confections	Scottish Longbreads	12.5	25.16	16.25	Below Average	Below Median
Confections	Sir Rodney's Marmalade	81	25.16	16.25	Over Average	Over Median
Confections	Sir Rodney's Scones	10	25.16	16.25	Below Average	Below Median
Confections	Tarte au sucre	49.3	25.16	16.25	Over Average	Over Median
Confections	Teatime Chocolate Biscuits	9.2	25.16	16.25	Below Average	Below Median
Confections	Valkoinen suklaa	16.25	25.16	16.25	Below Average	Median
Confections	Zaanse koeken	9.5	25.16	16.25	Below Average	Below Median
Dairy Products	Camembert Pierrot	34	28.73	33	Over Average	Over Median
Dairy Products	Flotemysost	21.5	28.73	33	Below Average	Below Median
Dairy Products	Geitost	2.5	28.73	33	Below Average	Below Median
Dairy Products	Gorgonzola Telino	12.5	28.73	33	Below Average	Below Median
Dairy Products	Gudbrandsdalsost	36	28.73	33	Over Average	Over Median
Dairy Products	Mascarpone Fabioli	32	28.73	33	Over Average	Below Median
Dairy Products	Mozzarella di Giovanni	34.8	28.73	33	Over Average	Over Median
Dairy Products	Queso Cabrales	21	28.73	33	Below Average	Below Median
Dairy Products	Queso Manchego La Pastora	38	28.73	33	Over Average	Over Median
Dairy Products	Raclette Courdavault	55	28.73	33	Over Average	Over Median
Grains/Cereals	Filo Mix	7	21.29	20.25	Below Average	Below Median
Grains/Cereals	Gnocchi di nonna Alice	38	21.29	20.25	Over Average	Over Median
Grains/Cereals	Gustaf's Kn√§ckebr√∂d	21	21.29	20.25	Below Average	Over Median
Grains/Cereals	Ravioli Angelo	19.5	21.29	20.25	Below Average	Below Median
Grains/Cereals	Tunnbr√∂d	9	21.29	20.25	Below Average	Below Median
Grains/Cereals	Wimmers gute Semmelkn√∂del	33.25	21.29	20.25	Over Average	Over Median
Meat/Poultry	P√¢t√© chinois	24	15.72	15.72	Over Average	Over Median
Meat/Poultry	Tourti√®re	7.45	15.72	15.72	Below Average	Below Median
Produce	Longlife Tofu	10	29.06	26.63	Below Average	Below Median
Produce	Manjimup Dried Apples	53	29.06	26.63	Over Average	Over Median
Produce	Tofu	23.25	29.06	26.63	Below Average	Below Median
Produce	Uncle Bob's Organic Dried Pears	30	29.06	26.63	Over Average	Over Median
Seafood	Boston Crab Meat	18.4	20.68	16.7	Below Average	Over Median
Seafood	Carnarvon Tigers	62.5	20.68	16.7	Over Average	Over Median
Seafood	Escargots de Bourgogne	13.25	20.68	16.7	Below Average	Below Median
Seafood	Gravad lax	26	20.68	16.7	Over Average	Over Median
Seafood	Ikura	31	20.68	16.7	Over Average	Over Median
Seafood	Inlagd Sill	19	20.68	16.7	Below Average	Over Median
Seafood	Jack's New England Clam Chowder	9.65	20.68	16.7	Below Average	Below Median
Seafood	Konbu	6	20.68	16.7	Below Average	Below Median
Seafood	Nord-Ost Matjeshering	25.89	20.68	16.7	Over Average	Over Median
Seafood	Rogede sild	9.5	20.68	16.7	Below Average	Below Median
Seafood	R√∂d Kaviar	15	20.68	16.7	Below Average	Below Median
Seafood	Spegesild	12	20.68	16.7	Below Average	Below Median

Distribution of unit prices by category
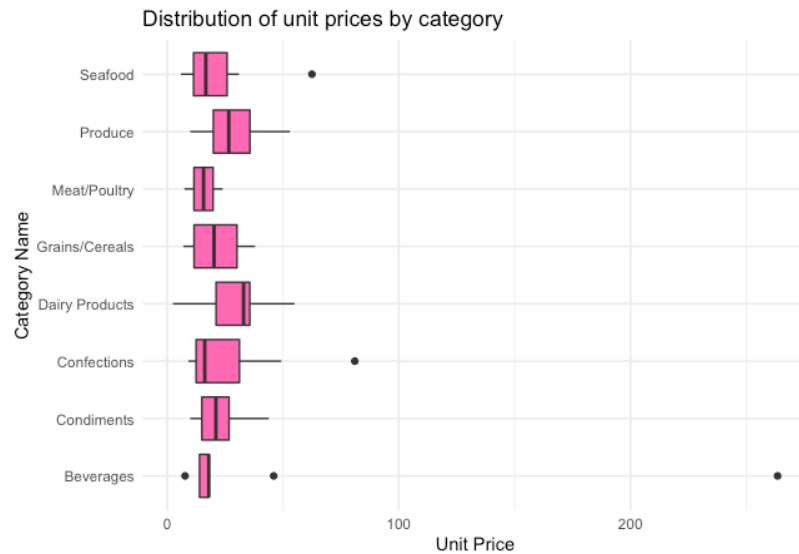
As seen from the above box plots, 5 out of 8 categories (Condiments, Grains/Cereals, Meat/Poultry, Produce and Seafood) have a median unit price which is relatively in the middle of the range of unit prices of the products. In contrast, Confections have a median unit price closer to the minimum value indicating right skewness, that is the median unit price is less than the average unit price. That means that most of product's unit prices in the Confections category is less than the average unit price. Similarly, the Dairy Products category also has a median unit price closer to the maximum value indicating left skewness, essentially meaning median unit price is greater than the average unit price. This means that more products from the Dairy Products category have a unit price above average than those with a unit price below the average.

List of KPIs to measure employee performances

The Sales team wanted to measure employees' performances based on some KPIs. To measure the employees' performances, the following table was prepared with the employees' full name, their job title, their total sales amount not considering discount, their total number of unique orders, their total number of orders, their average amount sold per product, their average amount sold per order, their total discount amount, their total sales amount taking into consideration discount, and their total discount percentage.

employee_full_name	employee_title	total_sale_amount_excluding_discount	number_unique_orders	number_orders	average_product_amount	average_order_amount	total_discount_amount	total_sale_amount_including_discount	total_discount_percentage
Margaret Peacock	Sales Representative	250187.45	156	420	595.68	1603.77	17296.6	232890.85	6.91
Janet Leverling	Sales Representative	213051.3	127	321	663.71	1677.57	10238.46	202812.84	4.81
Nancy Davolio	Sales Representative	202143.71	123	345	585.92	1643.44	10036.11	192107.6	4.96
Andrew Fuller	Vice President, Sales	177749.26	96	241	737.55	1851.55	11211.51	166537.76	6.31
Laura Callahan	Inside Sales Coordinator	133301.03	104	260	512.7	1281.74	6438.75	126862.28	4.83
Robert King	Sales Representative	141295.99	72	176	802.82	1962.44	16727.76	124568.23	11.84
Anne Dodsworth	Sales Representative	82964	43	107	775.36	1929.4	5655.93	77308.07	6.82
Michael Suyama	Sales Representative	78198.1	67	168	465.46	1167.14	4284.97	73913.13	5.48
Steven Buchanan	Sales Manager	75567.75	42	117	645.88	1799.23	6775.47	68792.28	8.97

Total sales amount including discount for each employee

Number of unique orders for each employee

Average amount sold per order by each employee

Average amount sold per product by each employee

Looking at the above bar plots, it is evident that Margaret Peacock and Janet Leverling were the top 2 salesperson in terms of the total sales amount and the number of sales orders they processed. However, looking at the bottom two bar plots, it becomes clear that Robert King and Anne Dodsworth were more efficient per sale as they usually had a higher sale amount per product and per order.

List of KPIs to measure employee performances across categories

The Sales team wanted another list of KPIs to measure employee performances across categories. To do that, another table was prepared with the category of product, employee full name, their total sales amount considering the discount applied, their percentage of total sales amount for each category against their total sales amount across all categories, their percentage of total sales amount for each category against the total sales amount across all employees for that category.

The generated table is shown in the following page.

category_name	employee_full_name	total_sale_amount	percent_of_employee_sales	percent_of_category_sales
Beverages	Margaret Peacock	50308.21	0.21602	0.18781
Beverages	Nancy Davolio	46599.35	0.24257	0.17396
Beverages	Janet Leverling	44757.4	0.22068	0.16709
Beverages	Andrew Fuller	40248.25	0.24168	0.15025
Beverages	Robert King	27963.83	0.22449	0.10439
Beverages	Anne Dodsworth	19642.55	0.25408	0.07333
Beverages	Laura Callahan	17897.85	0.14108	0.06682
Beverages	Steven Buchanan	11000.53	0.15991	0.04107
Beverages	Michael Suyama	9450.2	0.12786	0.03528
Condiments	Margaret Peacock	23314.87	0.10011	0.21985
Condiments	Andrew Fuller	14850.67	0.08917	0.14004
Condiments	Laura Callahan	14637.66	0.11538	0.13803
Condiments	Nancy Davolio	13561.56	0.07059	0.12788
Condiments	Janet Leverling	13381.64	0.06598	0.12619
Condiments	Anne Dodsworth	10125.54	0.13098	0.09548
Condiments	Robert King	8851.37	0.07106	0.08347
Condiments	Michael Suyama	4648.47	0.06289	0.04383
Condiments	Steven Buchanan	2675.3	0.03889	0.02523
Confections	Janet Leverling	33622.4	0.16578	0.2009
Confections	Nancy Davolio	28568.92	0.14871	0.17071
Confections	Margaret Peacock	27768.73	0.11923	0.16592
Confections	Laura Callahan	21699.91	0.17105	0.12966
Confections	Andrew Fuller	21455.69	0.12883	0.1282
Confections	Robert King	14518.99	0.11655	0.08675
Confections	Anne Dodsworth	8053.16	0.10417	0.04812
Confections	Michael Suyama	6859.63	0.09281	0.04099
Confections	Steven Buchanan	4809.8	0.06992	0.02874
Dairy Products	Nancy Davolio	36022.98	0.18751	0.15361
Dairy Products	Margaret Peacock	33549.8	0.14406	0.14307
Dairy Products	Janet Leverling	32320.83	0.15936	0.13782
Dairy Products	Robert King	27621.86	0.22174	0.11779
Dairy Products	Andrew Fuller	23812.55	0.14299	0.10154
Dairy Products	Steven Buchanan	21937.63	0.3189	0.09355
Dairy Products	Laura Callahan	21101.47	0.16633	0.08998
Dairy Products	Anne Dodsworth	21101.12	0.27295	0.08998
Dairy Products	Michael Suyama	17039.04	0.23053	0.07266
Grains/Cereals	Margaret Peacock	22579.61	0.09695	0.23583
Grains/Cereals	Janet Leverling	21235.01	0.1047	0.22179
Grains/Cereals	Andrew Fuller	11172.95	0.06709	0.1167
Grains/Cereals	Laura Callahan	11072.05	0.08728	0.11564
Grains/Cereals	Michael Suyama	9410.7	0.12732	0.09829
Grains/Cereals	Nancy Davolio	8465.9	0.04407	0.08842
Grains/Cereals	Robert King	6535.5	0.05247	0.06826
Grains/Cereals	Steven Buchanan	4027.56	0.05855	0.04207
Grains/Cereals	Anne Dodsworth	1245.3	0.01611	0.01301
Meat/Poultry	Margaret Peacock	30867.14	0.13254	0.18934
Meat/Poultry	Andrew Fuller	29873.6	0.17938	0.18325
Meat/Poultry	Robert King	21176.72	0.17	0.1299
Meat/Poultry	Janet Leverling	20502.62	0.10109	0.12577
Meat/Poultry	Laura Callahan	16395.28	0.12924	0.10057
Meat/Poultry	Nancy Davolio	15038.47	0.07828	0.09225
Meat/Poultry	Steven Buchanan	11488.2	0.167	0.07047
Meat/Poultry	Michael Suyama	9003.69	0.12181	0.05523
Meat/Poultry	Anne Dodsworth	8676.66	0.11223	0.05322
Produce	Nancy Davolio	19706.25	0.10258	0.19709
Produce	Margaret Peacock	17186.56	0.0738	0.17189
Produce	Laura Callahan	12016.52	0.09472	0.12018
Produce	Janet Leverling	11960.85	0.05897	0.11963
Produce	Michael Suyama	11560.7	0.15641	0.11562
Produce	Robert King	10753.38	0.08633	0.10755
Produce	Andrew Fuller	9376.48	0.0563	0.09378
Produce	Steven Buchanan	7109.02	0.10334	0.0711
Produce	Anne Dodsworth	314.81	0.00407	0.00315
Seafood	Margaret Peacock	27315.93	0.11729	0.2081
Seafood	Janet Leverling	25032.09	0.12342	0.1907
Seafood	Nancy Davolio	24144.15	0.12568	0.18394
Seafood	Andrew Fuller	15747.57	0.09456	0.11997
Seafood	Laura Callahan	12041.54	0.09492	0.09174
Seafood	Anne Dodsworth	8148.9	0.10541	0.06208
Seafood	Robert King	7146.58	0.05737	0.05445
Seafood	Michael Suyama	5940.7	0.08037	0.04526
Seafood	Steven Buchanan	5744.25	0.0835	0.04376

Total sales amount including discount per category for each employee
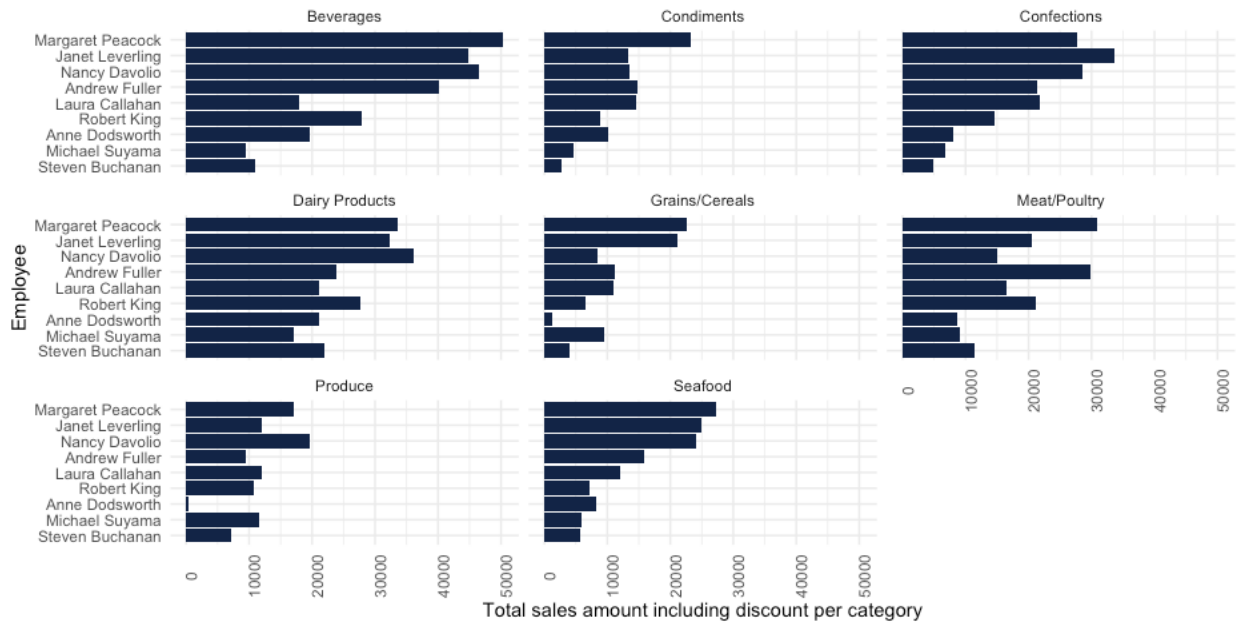
Looking at the bar plots, it is evident that Margaret Peacock and Janet Leverling are usually in the top 3 highest selling salesperson in most of the categories. However, Nancy Davolio was the top salesperson in the Dairy Products and Produce categories.