Northwind Database

An examination using 5 SQL queries

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Udacity Business Analytics Nanodegree 2018
Project: Create Reports from a Database
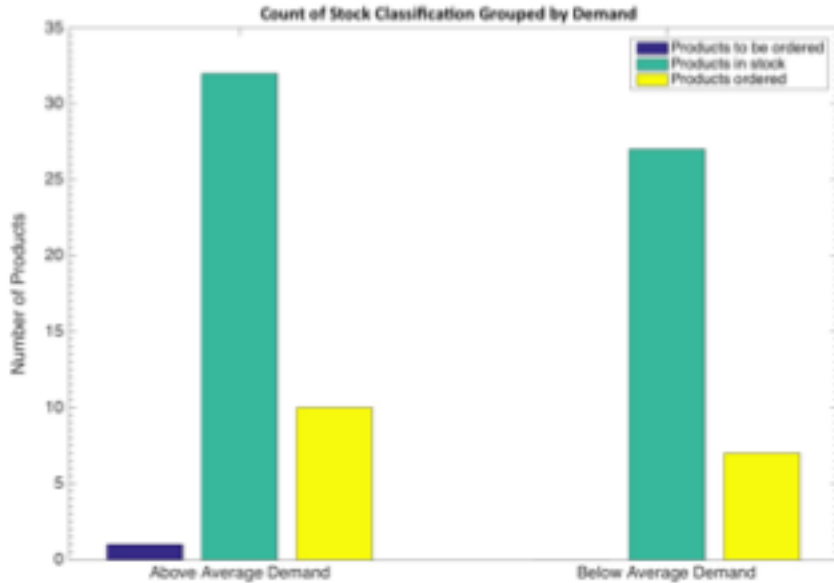
SQL queries with

Data visualization with

Examination of Stock Level & Demand.

Count of Stock Classification Grouped by Demand

Of the 77 products sold, 43 are classified as having above average demand.

Generally speaking stock levels are well maintained, however one product was not re-ordered and importantly has above average demand. This may lead to a loss of revenue if not restocked.

Examination of Stock Level, Demand & Lead Time.

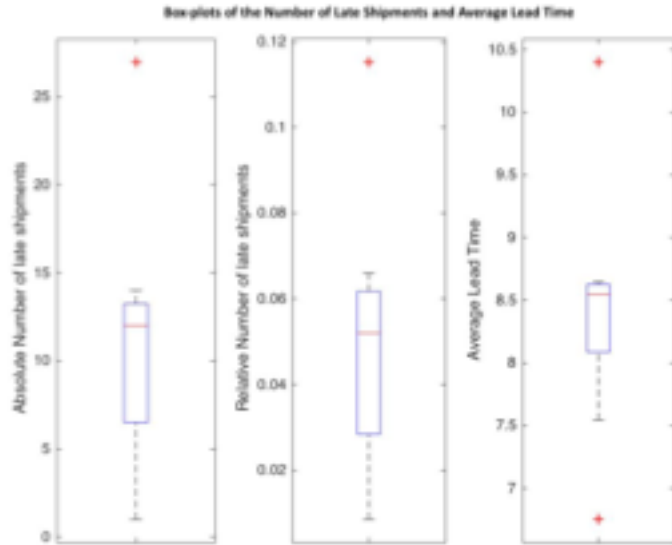

Product Demand, Units in Stock and Average Lead Time
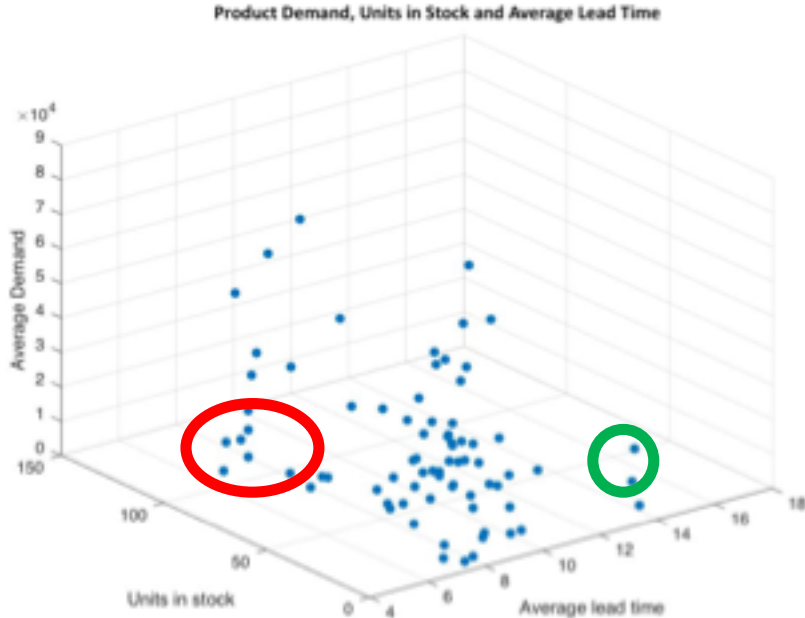
Further analysis of stock levels, demonstrate two areas that require further investigation.

The products in the red circle have a high level of stock, but low demand. These products may represent a means to free up cash flow and reduce the cost of storage.

In contrast, the products in the green circle have had a very large lead time despite having products in stock. Reasons for this large lead time should be investigated.

Staff Lead time & Late shipments.

Box plots of the Number of Late Shipments and Average Lead Time

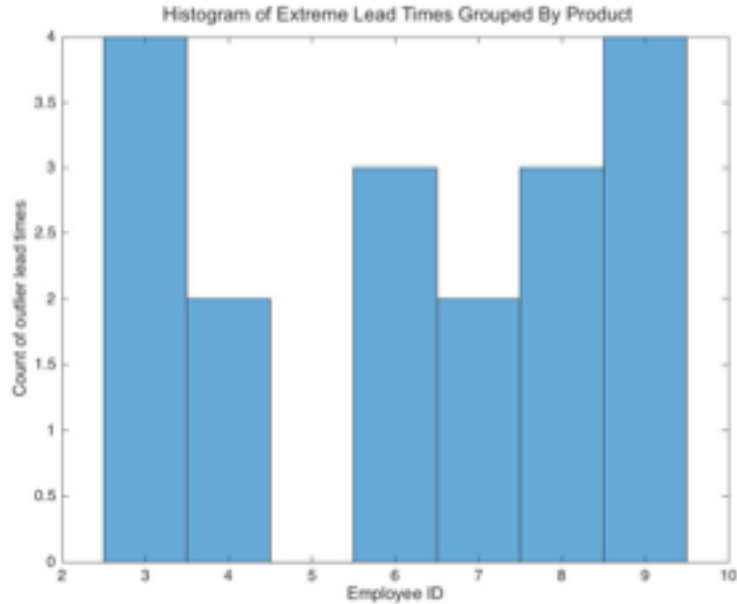| EmployeeID	Number of late shipments	Mean lead time	Number of orders	Relative number of late shipments
1	7	7.545	314	0.022
2	14	8.267	232	0.060
3	13	8.548	321	0.040
4	27	8.648	409	0.066
5	1	6.752	117	0.009
6	5	8.549	164	0.030
7	10	8.281	171	0.058
8	13	8.620	250	0.052
9	12	10.404	104	0.115

From examining the relative number of late shipments (number of late shipments/number of orders) and average lead time, it can be seen that Employee 9 has been identified as being an outlier in terms of negative performance.

In contrast, employee 5 has a particularly low average lead time. These metrics may be useful to guide staff training.

Of note, examining the number of late shipments in absolute terms is misleading.

Staff Lead Times: Grouped by Product.

Histogram of Extreme Lead Times Grouped By Product

In the previous slide, average lead times were examined. However this analysis may be misleading without considering the product type.

The current analysis, demonstrates that both employee 3 and 9 had the most amount of extreme lead times (considered as high outliers) in comparison to their colleges for the same products.

In contrast, employees 1,2, and 5 recorded no lead times considered as extreme.

Volume of Employee Sales

Number of Sales Orders - Absolute and Relative to Time in Employment
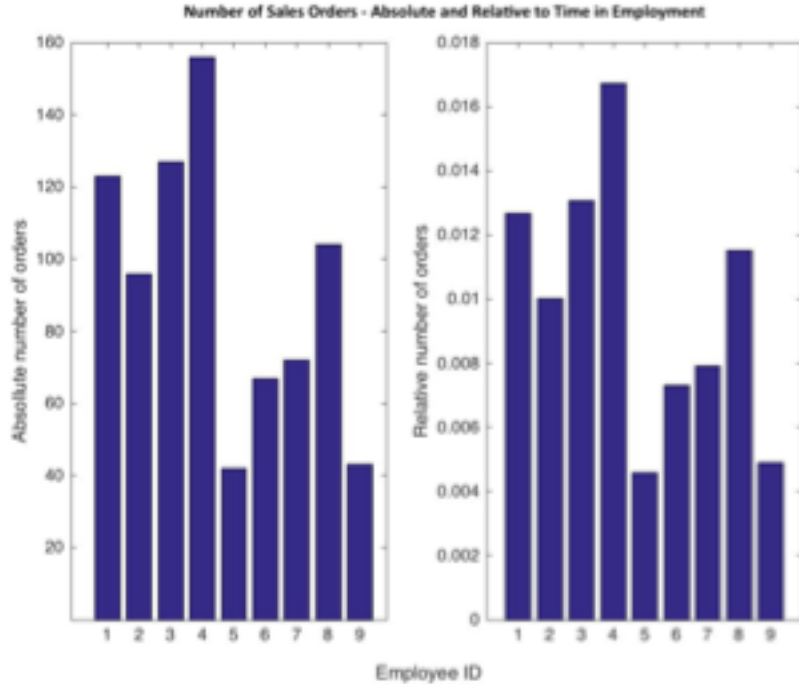
This analysis considers employee performance via absolute orders taken and relative to the number of days in employment.

As per both graphs, it can be seen that employee 4 has had a large number of sales.

In contrast, both employee 5 and employee 9 has the lowest sales.

It is worth note that employee 5's role as a manager may have influenced the number of orders taken by this employee.

Summary Report

- This report identified one product which has above average demand and needs to be reordered (Slide 2).

- Further analysis of stock identified a number of products with low demand and a high stock level. These products should be explored as a means of reducing incurred storage costs. In addition, some products have a large average lead time despite being in stock. This should be investigated further (Slide 3).

- In terms of staff performance, employee 9 was identified as an area of concern in terms of both number of late shipments and average lead time (Slide 4). Further analysis identified that employees 3 and 9 had the most amount of extreme lead times in comparison to their colleges for the same products (Slide 5).

- In terms of order frequency, employee 9 is again identified as a possible poor performer. While employee 5 also had low sales, this may be explained by their function as a manager. This analysis is of course limited by the lack of information on profitability of these sales (Slide 6).

- The top performer overall (high orders and low errors) was employee 1.