



NORTHWIND
COMPANY

RECOMMENDATIONS
FOR STAKEHOLDERS

Overview

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- Today's shareholders meeting data analysis agenda:
 - Approach
 - Statistical Tests Used
 - Hypothesis Tests & Findings
 - Company Stakeholder Key Takeaways



Approach

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- Approach
 - Meaningful business driven hypothesis tests were created using the data provided by Northwind.
 - There were three statistical metrics used:
 - Cohen's D, ANOVA test, and Student t-test.
 - The goal of the statistical tests is to increase the profit margin of Northwind.
 - Increase profit margins by decreasing marketing on certain products, selecting the correct suppliers, and pricing products to find the sweet spot in each region to maximize profits/reduce supplier costs.
- Statistically significant differences were found in two of the three hypothesis tests.



Hypothesis Tests & Findings

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- The following hypothesis tests were conducted:
 - *Is there a statistically significant difference between discounted and non discounted products?*
 - *Is there a statistically significant difference in having the top product vs. having a product in the top 5 bestselling products?*
 - *Is there a statistically significant difference between the supplier's total profit and quantity ordered by customers?*
 - *Does the price of the product change based on region?*



H_0 vs. H_A



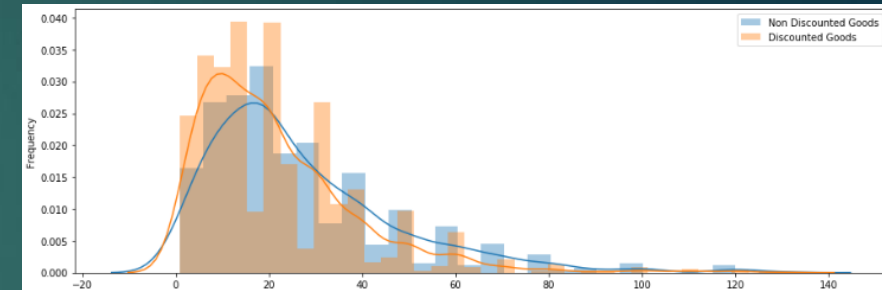
Hypothesis Tests & Findings

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- *Is there a statistically significant difference between discounted and non discounted products?*
- **Null Hypothesis:** there is no difference in order quantity between discounted vs. non discounted goods
- **Alternative Hypothesis:** there is a difference in order quantity between discounted vs. non discounted goods
- **Results:** There is a statistical significant difference between the order quantity of discounted vs. non discounted goods.
 - After further analysis, there is a statistical difference for quantity of products ordered for 5%, 10%, 15%, 20%, and 25% discounted goods.

Distribution of Discounted vs. Non-Discounted Goods



Discount Level	T-Score	P-Value
5%	4.42	1.06e ⁻⁰⁵
10%	2.42	1.55e ⁻⁰²
15%	4.41	1.10e ⁻⁰⁵
20%	3.6	3.26e ⁻⁰⁴
25%	4.3	1.78e ⁻⁰⁵



Hypothesis Tests & Findings

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- *Is there a statistically significant difference in having the top product vs. having a product in the top 5 bestselling products?*
- **Null Hypothesis:** there is no difference in order quantity between top 5 products
- **Alternative Hypothesis:** there is a difference in order quantity between top 5 products
- **Results:** There is not a statistical significant difference between the top selling product and the remaining top four products. Having the most popular item does not matter.

Product Name	Quantity
Camembert Pierrot	1577
Raclette Courdavault	1496
Gorgonzola Telino	1397
Gnocchi di nonna Alice	1263
Pavlova	1158

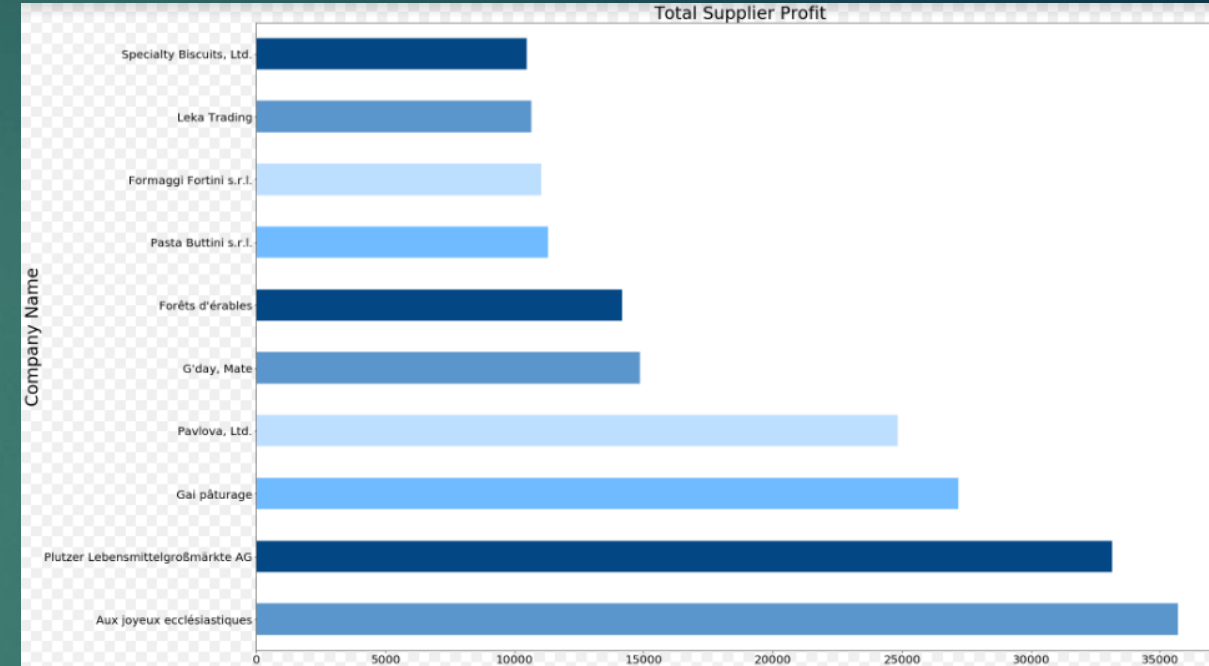


Hypothesis Tests & Findings

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- *Is there a statistically significant difference between the supplier's total profit and quantity ordered by customers?*
- **Null Hypothesis:** there is no difference between the suppliers quantity ordered and the total supplier profit
- **Alternative Hypothesis:** there is a statistical difference between the suppliers quantity ordered and the total supplier profit
- **Results:** There is a statistically significant difference between the total profit of a company and the quantity ordered



The above graph shows the top ten suppliers' profit.

The top three companies were:

1. Aux Joyeux 2. Plutzer. 3. Gal Paturage



Hypothesis Tests & Findings

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- *Does the price of the product change based on region?*
- **Null Hypothesis:** there is no difference in the price of product throughout regions
- **Alternative Hypothesis:** there is a statistical difference between the price of products throughout regions
- **Results:** The price of the product will be priced differently across different regions.

Region	Total Price of Total Products
Western Europe	\$4369
North America	\$2475
South America	\$1697
British Isles	\$1089
Northern Europe	\$824

Distribution of Price across regions

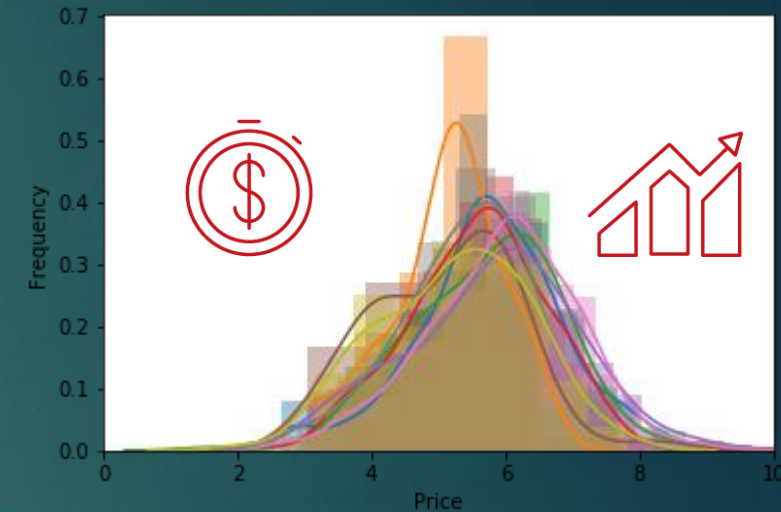


Key Takeaways

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- Company Stakeholder Key Takeaways:
 1. Do not focus on the number one selling product, instead push the top five products (may want to look into pushing the top 15 products)
 2. Be cautious of suppliers, be more selective and try to push the suppliers with the largest profits as they will sell the most goods.
 - Maybe something with look at the products the top supplier profiting are selling and push those products more
 3. Ensure all products are carefully priced in order for demand to be in line with their regions pricing market.



The background features a complex, abstract pattern of 3D rectangular blocks and prisms. These shapes are arranged in a way that creates a sense of depth and perspective, with some blocks appearing to rise from a base and others recede into the distance. The color palette is primarily grayscale, with varying shades of gray and black. Two thin, horizontal red lines are positioned near the top and bottom edges of the image, framing the central text area.

Thank You,
for your time!