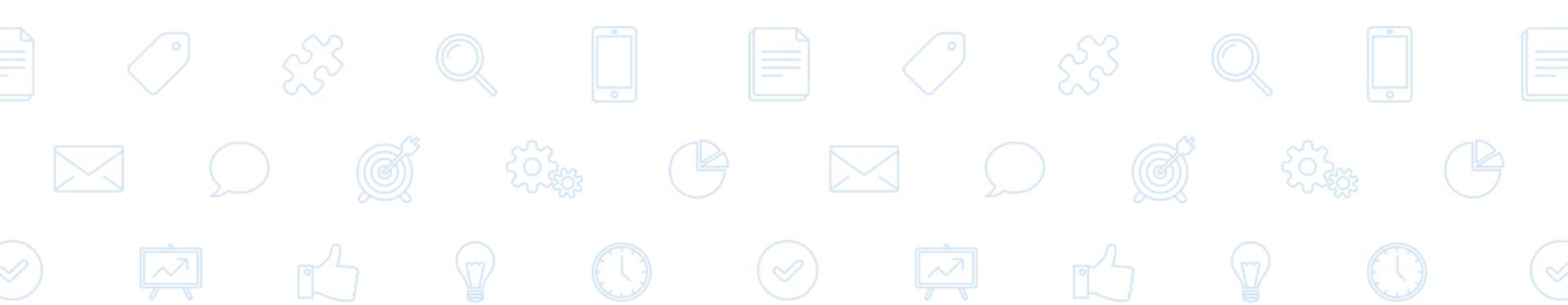




# THE COMPANY

Presented By

**Dominick Russo**



# When Do Brands Matter?

Case Study 1

## CASE STUDY

1

# When Do Brands Matter?



**Brands are chosen over others because of...**

- ▶ Trust/Reputation
- ▶ Quality Perception
- ▶ Recognition
- ▶ Positive Experiences

## CASE STUDY

1

# Do Brands Matter for Industrial Products?

Brands matter less for:

- ▶ Low cost items
- ▶ Disposable items

Brands matter more for:

- ▶ Higher cost items
- ▶ Long-term use items

To Whom...? Customers!



# How Do We Know When Brands Matter?

## CASE STUDY

1

When consumers pay more for similar items

- ▶ Spending more on identical item

When consumers tell us they matter

- ▶ Buying only specific brands
- ▶ Indicating decision was based on brand

# When and Why Do Brands Matter?

*"When it is difficult to determine the quality of a product before purchase and the consequences of poor quality are significant, it makes economic sense for consumers to rely on brand names and the company reputations associated with them. By paying more for a brand-name product in those circumstances, consumers are not acting irrationally. Consumers know that companies with established reputations for consistent high quality have more to lose if they do not perform well—namely, the loss of the ability to continue to charge higher prices."*

~ Benjamin Klein  
from "Brand Names"

*The Library of Economics and Liberty*  
[LINK](#)

# Detecting When Brands Matter



## Find The Data:

- ▶ Company data
- ▶ Web scraping
- ▶ 3<sup>rd</sup> party data
  - ▶ Open-source
  - ▶ Purchase

## Prepare The Data:

- ▶ Clean
- ▶ Standardize
- ▶ Format for use

# Detecting When Brands Matter



## Analyze The Data:

- ▶ Price/Volume Relationship
  - ▷ Does purchase volume of a more expensive brand indicate preference?
- ▶ Reviews
  - ▷ Which brands are consistently rated higher than lower-priced identical products?
  - ▷ Sentiment Analysis: Can we find positive/negative sentiment for brands using NLP?
- ▶ Customer Profiles
  - ▷ Find demographics that show strong brand preferences



# Making Recommendations

Case Study 2

# CASE STUDY 2

## The Raw Data

"order_number"	"I1"	"I2"	"I3"	"sku"	"brand"	
"168266"	"Power Tools"	"Power Saws and Accessories"		"Reciprocating Saw Blades"	"265105"	"2768"
"123986"	"Safety"	"Spill Control Supplies"		"Temporary Leak Repair"	"215839"	"586"
"158978"	"Hardware"	"Door Hardware"	"Thresholds"	"284756"	"1793"	
"449035"	"Electronics, Appliances, and Batteries"	"Batteries"		"Standard Batteries"	"12579"	"1231"
"781232"	"Motors"	"General Purpose AC Motors"		"General Purpose AC Motors"	"194681"	"2603"
"701116"	"Motors"	"General Purpose AC Motors"		"General Purpose AC Motors"	"310296"	"1068"
"555497"	"Motors"	"Motor Supplies"	"Capacitors"	"306732"	"1068"	
"282317"	"Safety"	"Footwear and Footwear Accessories"	"Insoles"	"148549"	"2696"	
"644437"	"Hand Tools"	"Sockets and Bits"	"Crowfoot Socket Wrenches"	"283869"	"3356"	
"830236"	"Security"	"Two Way Radios and Accessories"		"Handheld Two Way Radios"	"99449"	"2830"
"483827"	"HVAC and Refrigeration"		"Air Filters"	"Pleated Air Filters"	"301809"	"123"
"595763"	"Cleaning"	"Trash Bags and Liners"		"Trash Bags"	"268122"	"4355"
"834301"	"Hand Tools"	"Tool Storage and Transfer Tanks"		"Tool Storage Accessories"	"285224"	"4692"
"190274"	"Electrical"	"Raceways"	"Raceways"	"205118"	"2438"	

# CASE STUDY 2

## Recommendation System Approach

### Market Basket Analysis

Use association analysis to find items that are frequently purchased together (frequent itemsets)

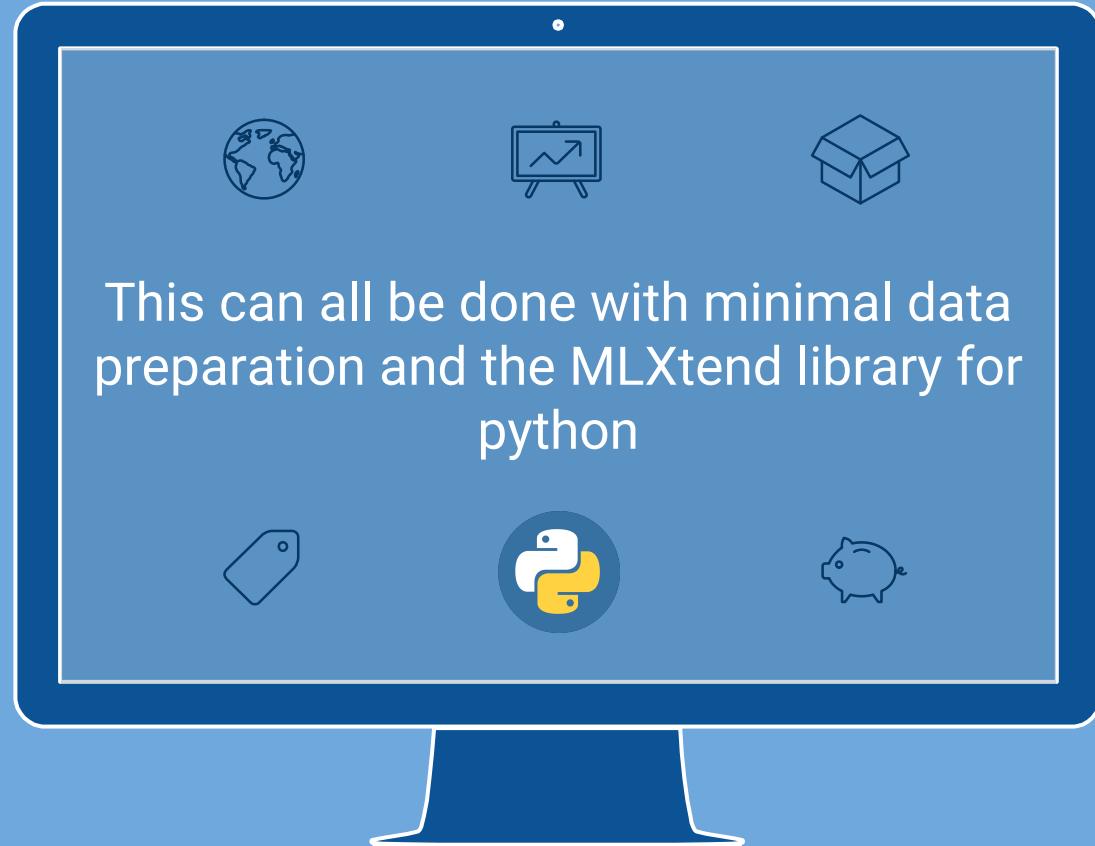
### Association Rule Mining

Generate rules for frequent itemsets with metrics that can adjusted as desired for specificity

### Make Recommendations

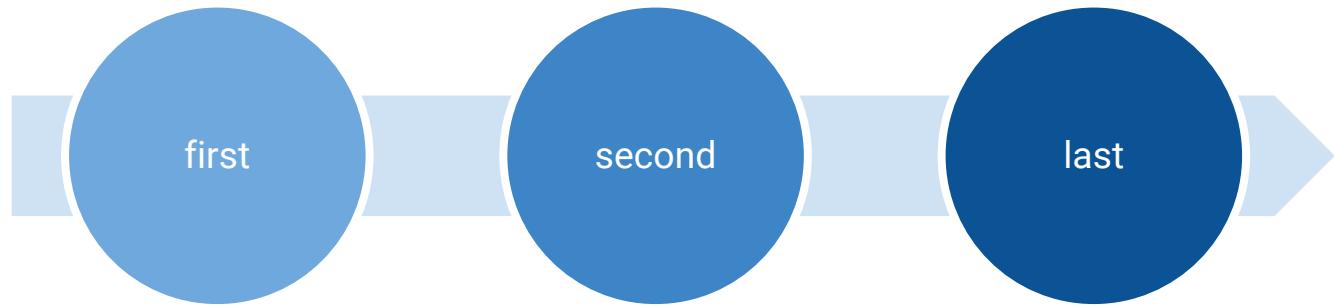
Use association rules to recommend other products that are frequently associated. Use popular products to drive sales of others

# CASE STUDY 2



# CASE STUDY 2

## Recommendation System Implementation



### Data Prep

- ▶ Group by order number
- ▶ Predict L3 Category
- ▶ One-hot encode

### Assoc. Rules

- ▶ Apriori algorithm
- ▶ Find frequent itemsets
- ▶ Generate Association rules

### Get Recs.

- ▶ Filter associations
- ▶ Support
- ▶ Lift
- ▶ Confidence

# CASE STUDY 2

## Outcome

### Key Terms

- ▶ **Support:** Relative frequency items are in the same transactions.
- ▶ **Lift:** Ratio of the observed support to what is expected if the association was random  
Greater than 1 = “interesting” association
- ▶ **Confidence:** Reliability measure for the association rules.

### Recommendation Parameters

- ▶ Support  $\geq 1$
- ▶ Lift  $\geq 6$
- ▶ Confidence  $\geq 80\%$

# CASE STUDY 2

## Recommendations Generated (Sample Best/Worst)

Antecedents (Items)	Consequents (Recommendations)	Support	Confidence	Lift
Lock Nuts, Hex Nuts, Lock Washers	Flat Washers	0.013127	0.923201	7.892349
Trash Bags, Disposable Gloves, Toilet Paper	Paper Towels, Rolls	0.010004	0.822864	12.547244
Lock Nuts, Flat Washers, Hex Nuts, Lock Washers	Hex Head Cap Screws	0.011447	0.872019	8.676589
Flat Washers	Pipe Sealant Tape, Lock Washers	0.010042	0.085847	6.956559
Cut-Resistant Gloves	Standard Batteries, Cut-Resistant Sleeves	0.010767	0.086561	6.180698
Flat Washers	Hex Nuts, Black Pipe	0.010996	0.094007	6.888870

# CASE STUDY 2



## Notebook & Code:

[https://github.com/deejayrusso/E-Commerce-Recommendations/blob/master/E-Commerce Recommendation Notebook.ipynb](https://github.com/deejayrusso/E-Commerce-Recommendations/blob/master/E-Commerce%20Recommendation%20Notebook.ipynb)



## CASE STUDY

# 2

# Improvements

- ▶ Automate pipeline
- ▶ Automate formatting of data for new orders
- ▶ Use more varied data for better recs
- ▶ Increase strictness of parameters
- ▶ Periodically retrain model
- ▶ Explore more complex association mining methods



# THANKS!

**Any questions?**

You can find me at

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- ▶ <http://www.github.com/deejayrusso>