

Trend analysis and forecasting

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Singapore (新加坡) / CC BY-SA 2.0

NoSo – Co-Founder

William Lee – 14 years experience (Import & Export)

- (Co13) - Currently working on NASA project in Medgar Ever College
 - Senior Research Market Analysis for small business

Roger Ren – MS. Data Science, MS. Materials Engineering

- (Co12) Research scientist at Amazon Alexa AI (Boston)

Hans Lau - Biomedical Engineer

- (Co11) Currently working as Senior Analyst, Data Sciences at Wavemaker

NoSo - Who we are?

- Startup company for small business.
- 1. Analyze data for small businesses: Market research, consumer, new customer, existing customer, products quality and quantity.
- 2. Identify business needs and problem, provide solution & suggestion for improvement.
- 3. Build models such as forecasting Trends, Sales forecast, Recommendation and classification of products.
- 4. Create platform to identify market needs, estimate market size and find market opportunity based on their needs.

Contents

- Purpose
- Target clients
- Data
- Web Trends
- E-commerce capacity and production
- Algorithms design
- Prediction based on Model
- Forecasting Trend

Two dataset.

Option 1. Online dataset.

1. ETA & proof concept analysis
2. Build Final product.

Option 2. Inventory dataset.

1. Explore data, identify patterns
2. Create model/algorithm for reorder items & Inventory control.

First Client – USJH

01

Small business
owners (\$20 -30
millions sale
revenue)

02

Data set: E-
commerce data
only

03

Fashion Industry:
Wholesale &
Importers for
women and men
accessories.

Second Client – UNO

01

Small business
owners (\$5 - 10
millions sale
revenue)

02

Data set: Sale
revenue &
Inventory

03

Fashion
Industry:
Distributor for
women
accessories.

Data set

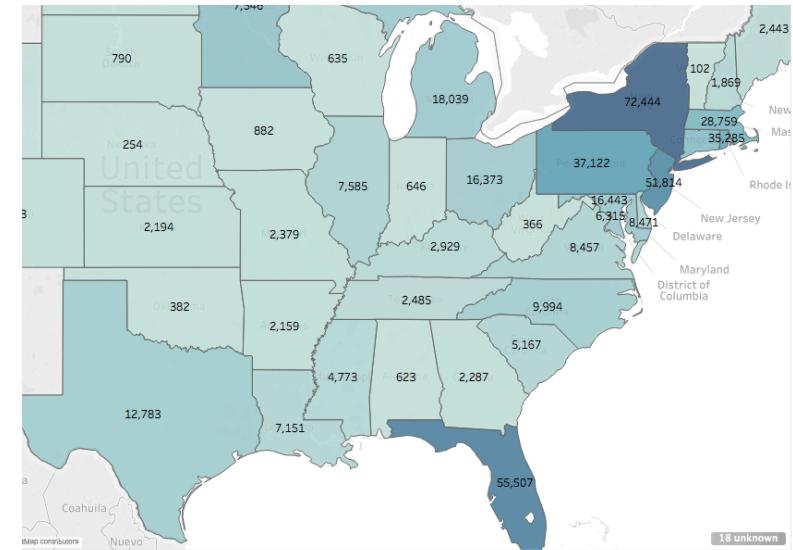
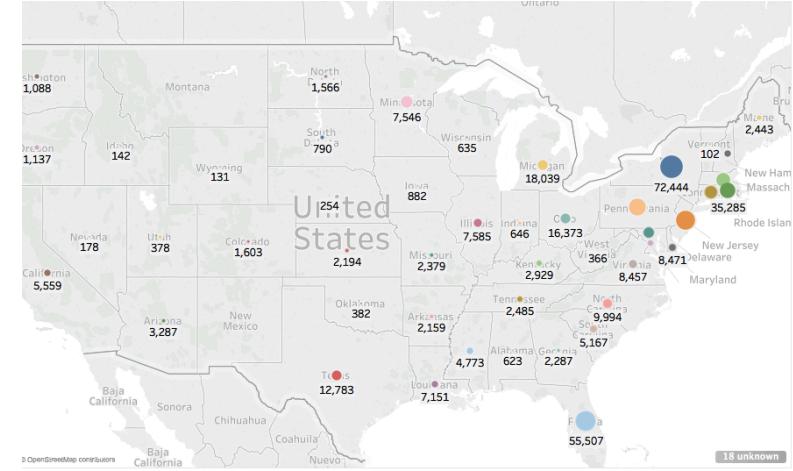
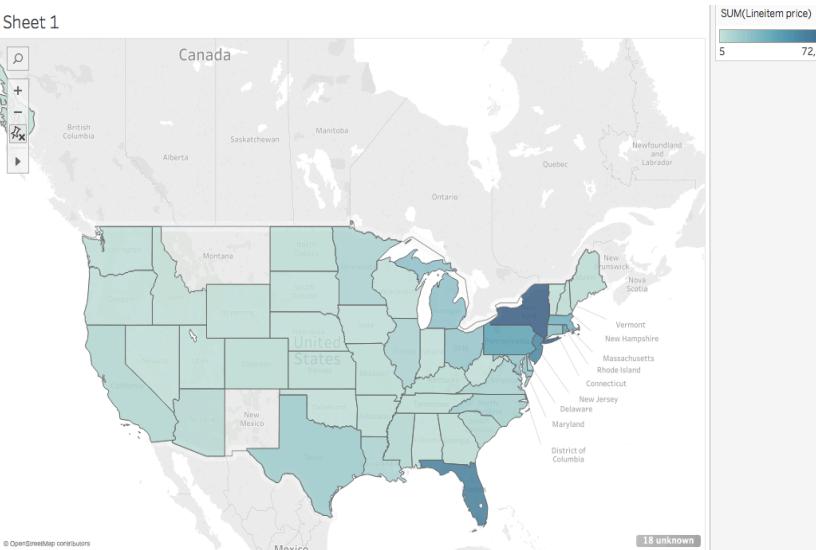
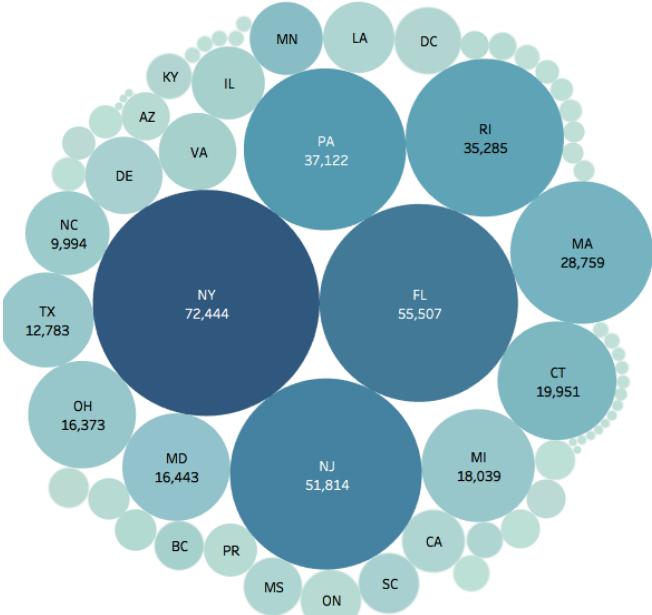
- Everyone who will participating in the project must sign non-disclosure agreement.
- Real data set (e-commerce) 2015-2018
- Depending on the size of the participants (1-2 different set of data will be provided)

Forecasting

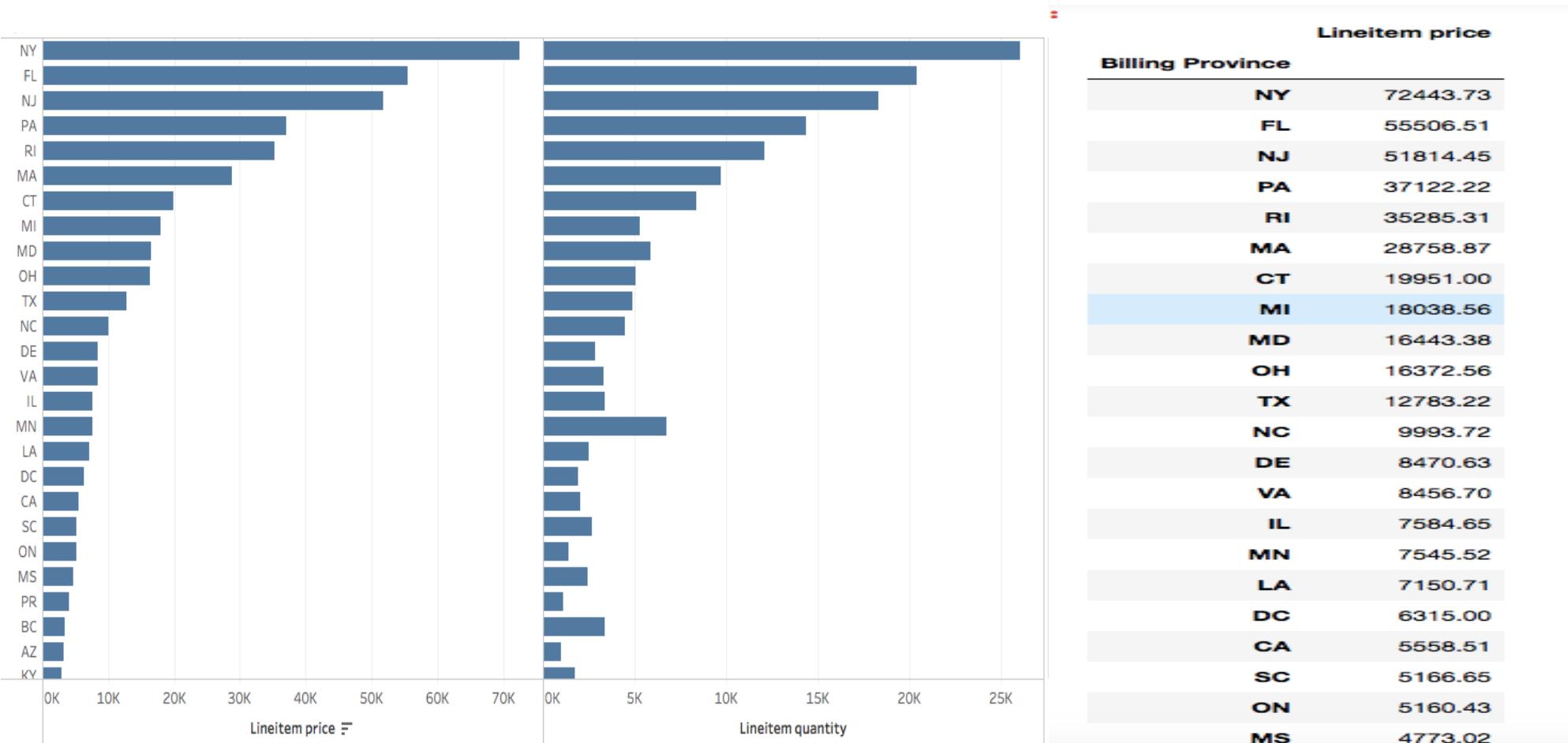
Forecasting Trends based on Location and time (Seasonality)

- Category: Necklace, earring, bracelet and ring
- Material: Stone, Metal, Brass and etc
- Color: Gold, Silver, Pink and so on.
- Size: Ring (5-12), Bracelet (one size, stretchy..), necklace: (

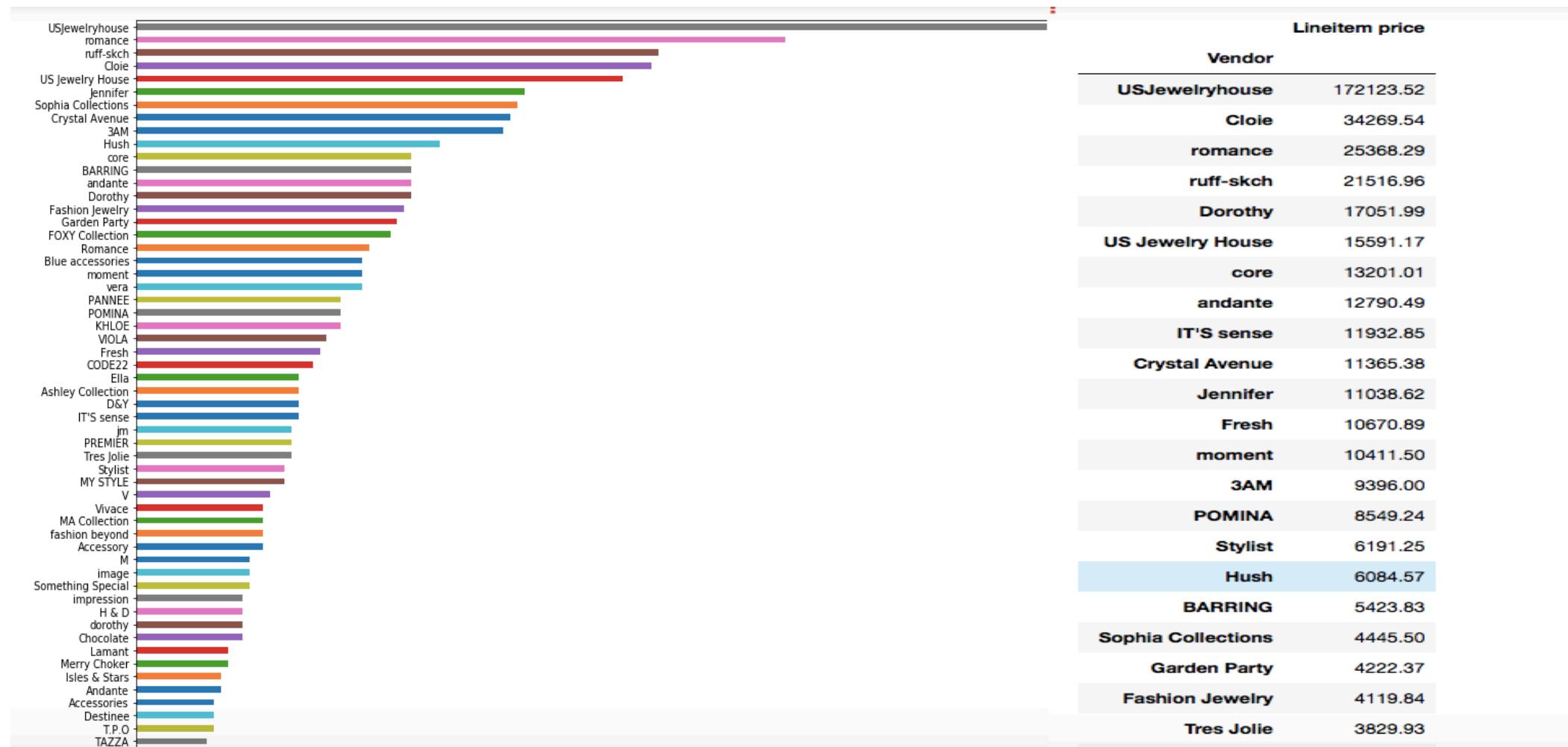
Summary: Top hot states



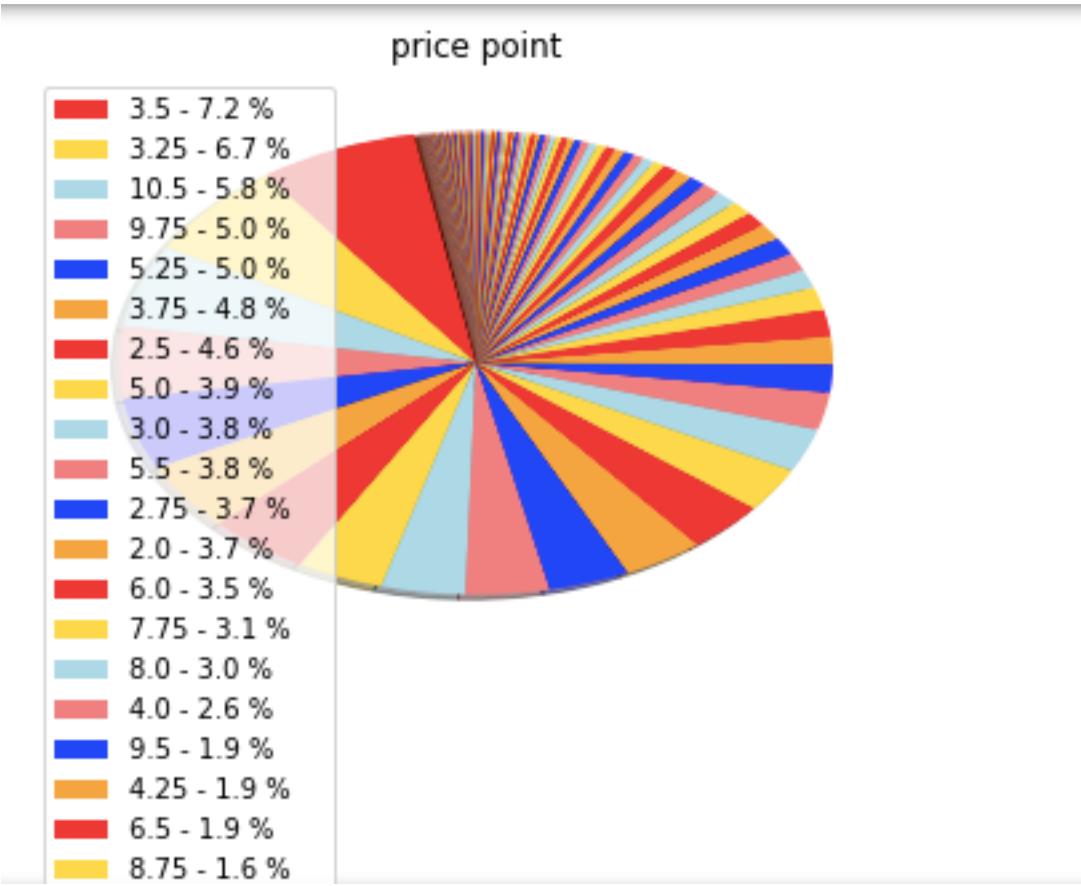
Summary: Top 20 states – Total purchase



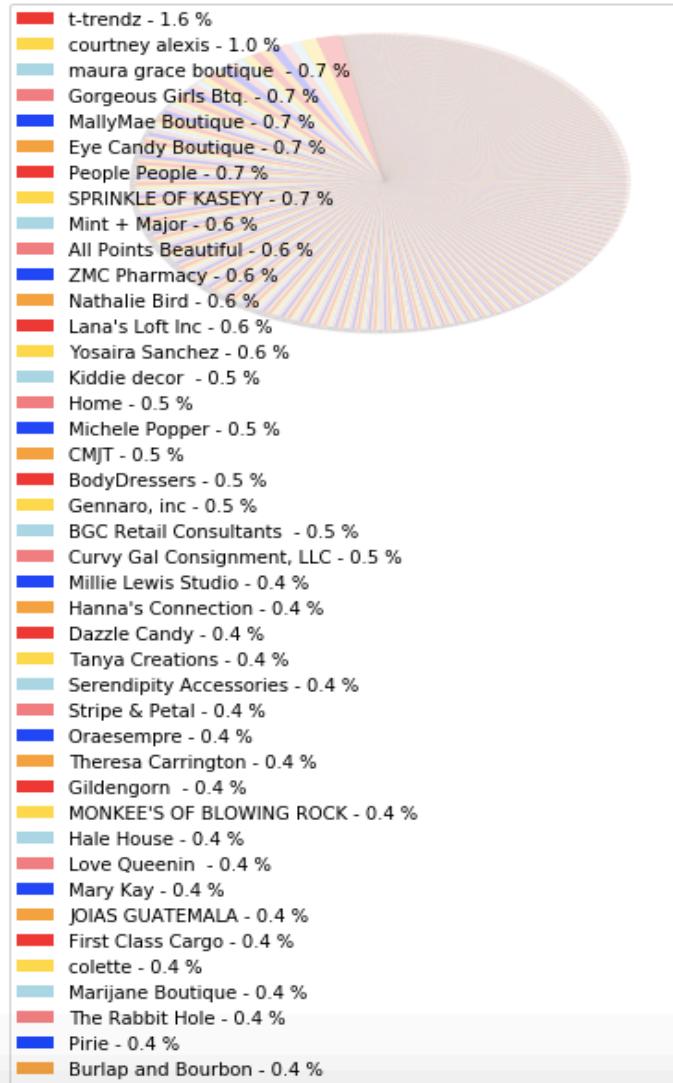
Summary: Top 20 best vendors – Online sale



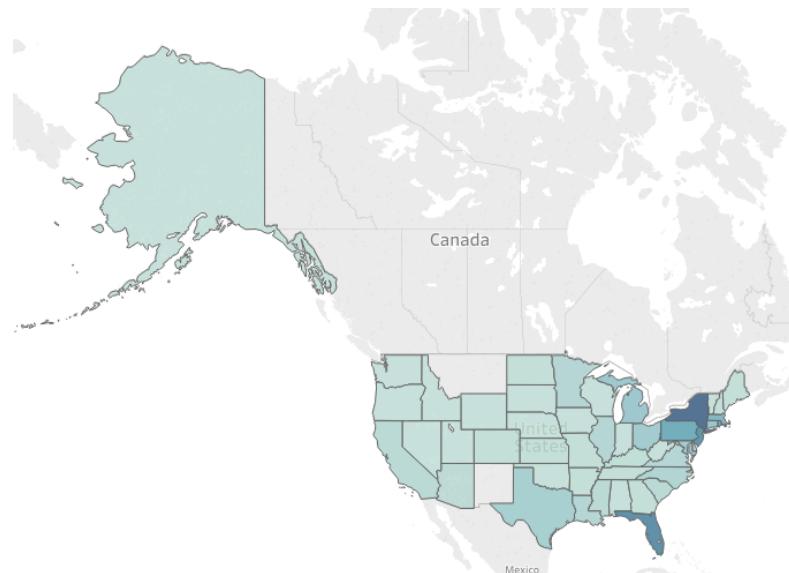
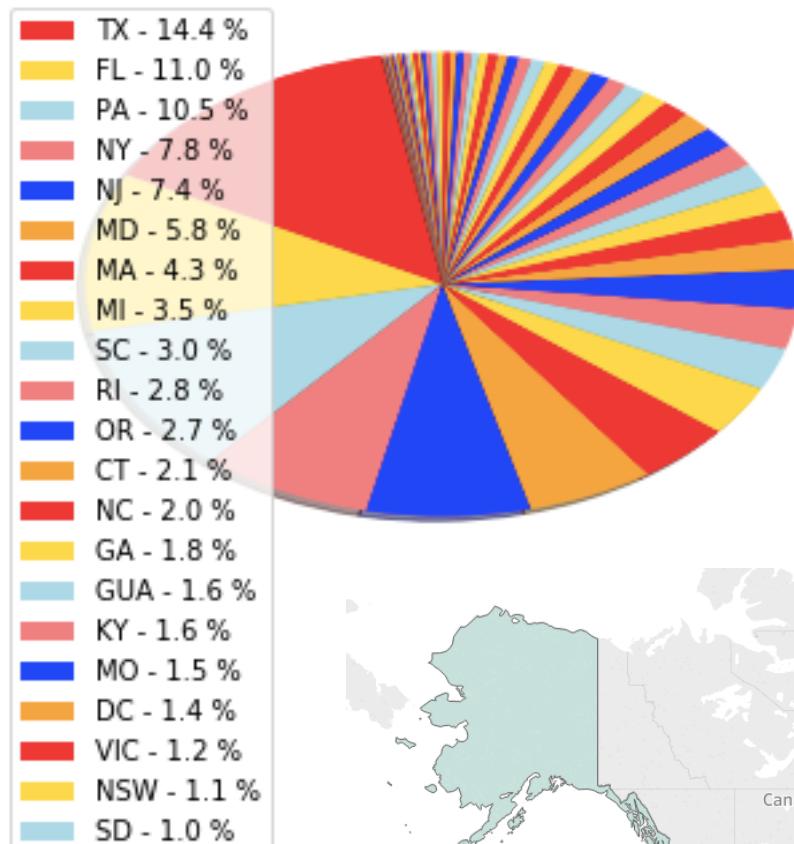
Summary: Top 20 best price point – Online sale



Number of count for customers

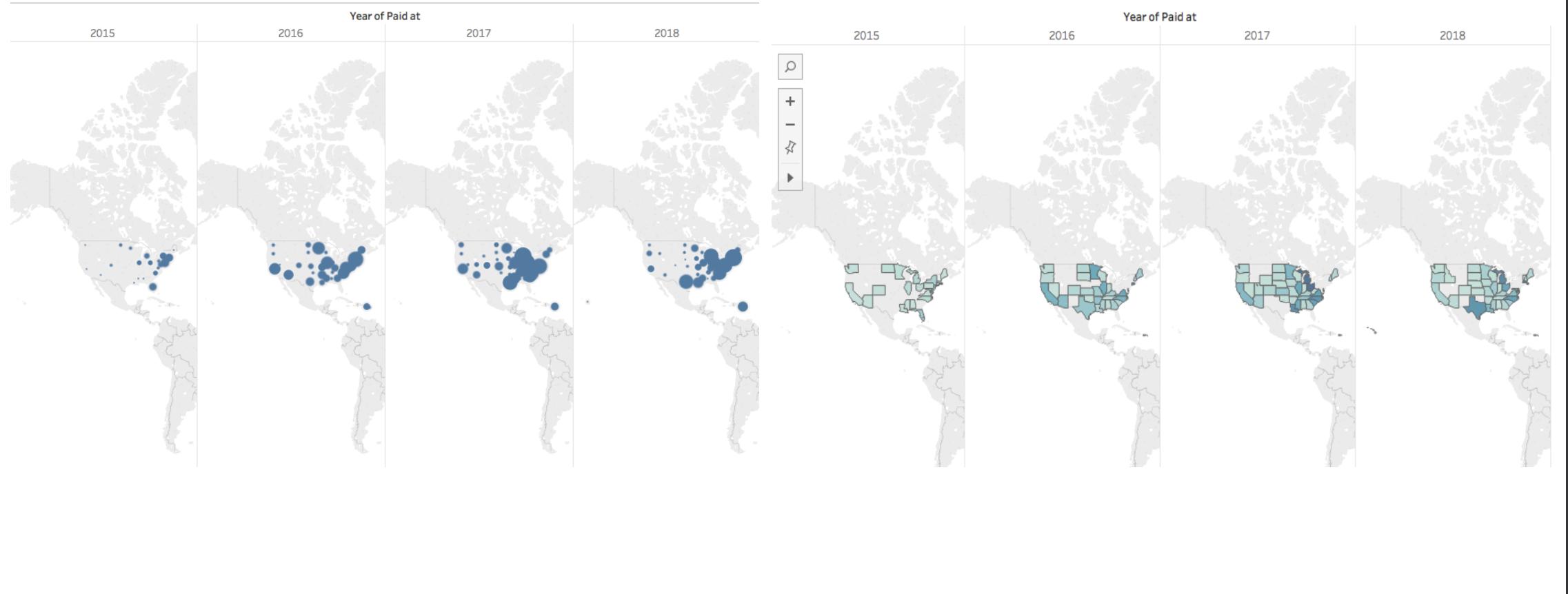


Distribution by state



E-commerce capacity and production

Look in the slide notes below for topics to consider talking about

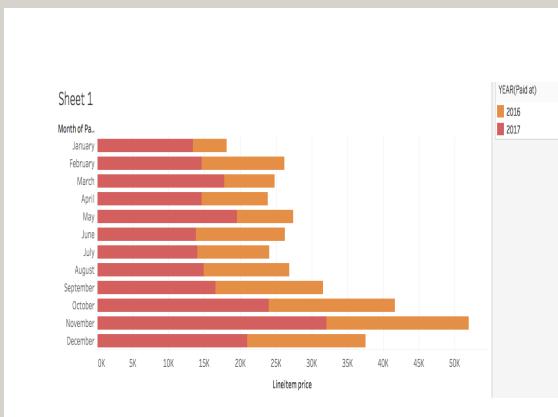
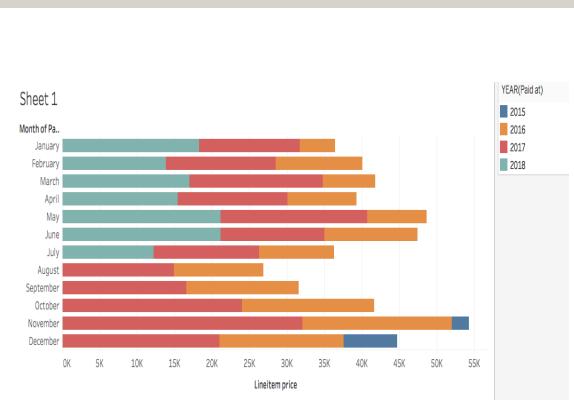
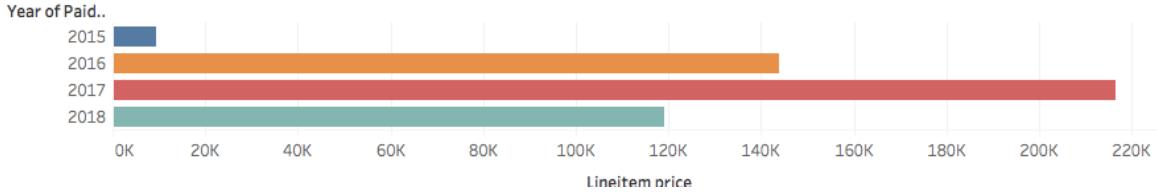


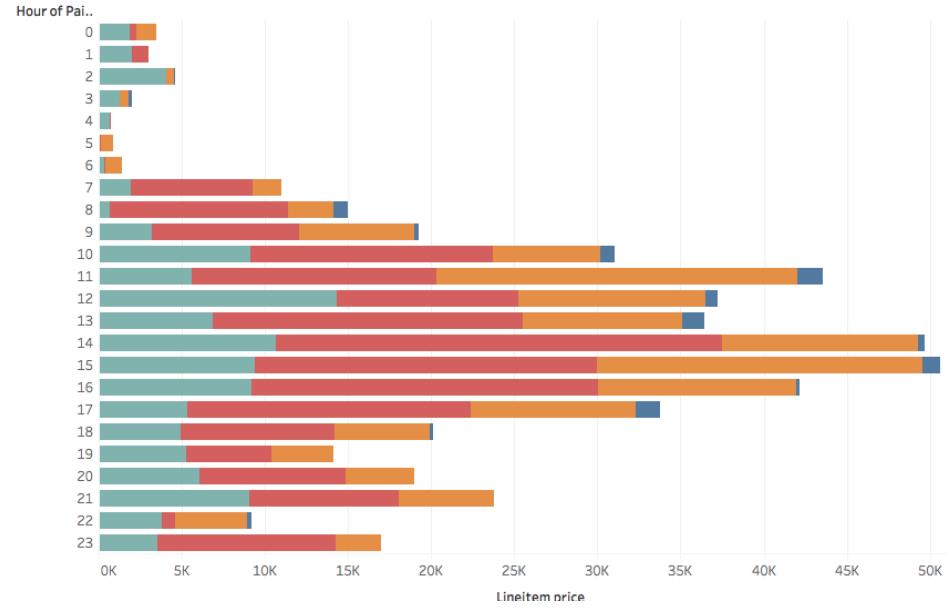
2015 – 2018 States order through US Jewelry Online

Look in the slide notes below for topics to consider talking about

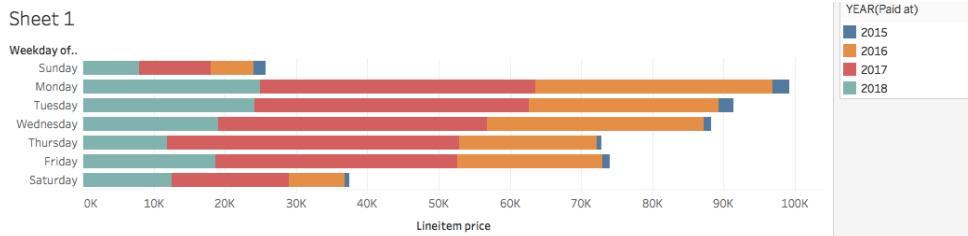
Economics – Shopify best product sold 2015-2018

- 2017 highest sold
- **High sold & traffic Months**
- October & November
- **High traffic weekdays**
- Monday and Tuesday
- **2018 high traffic hour are**
10:00, 12:00, 14:00, 15:00 PM





Sheet 1



Small-scale to Large scale

Machine Learning Models

Look in the slide notes below for topics to consider talking about

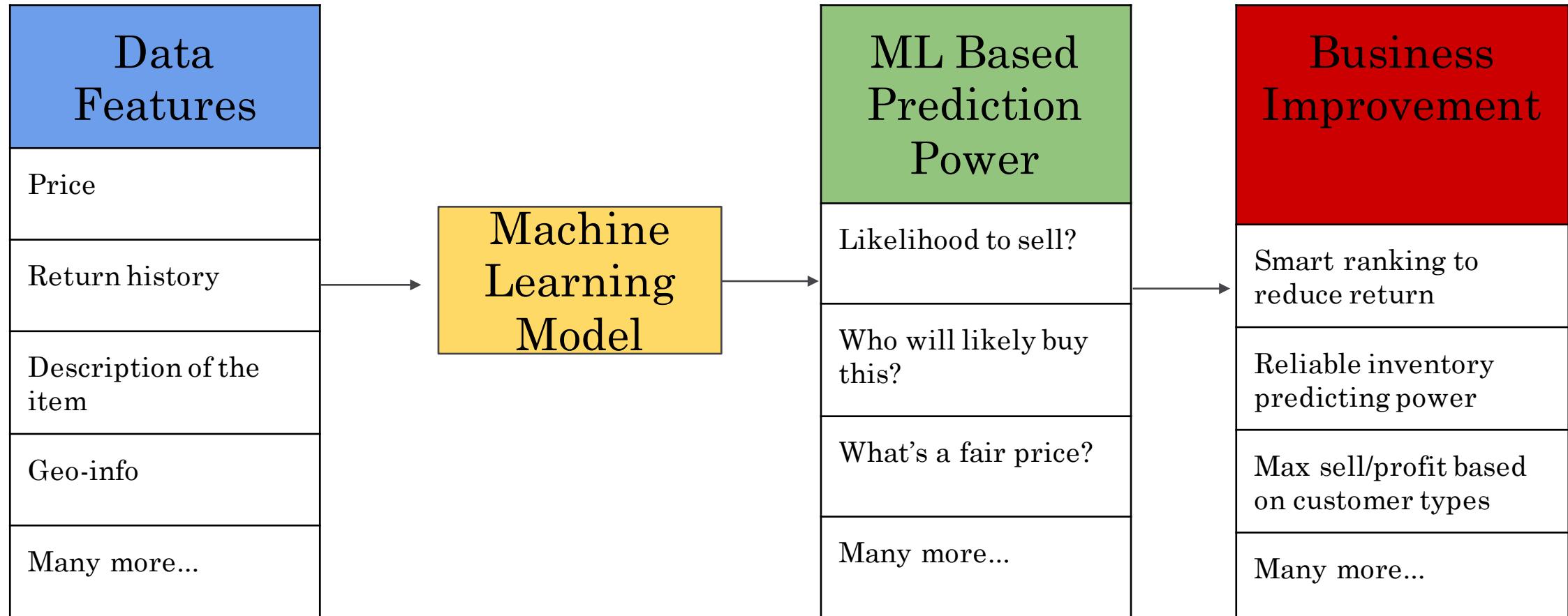
Go beyond just descriptive

- What descriptive models is able do:
 - Over all summary of the business performance
 - Highlight important dates, times and items
 - Give some numerical values for future decision reference
- What descriptive models is **NOT** able to do:
 - Find what features make an item popular / unpopular?
 - Predict what items will likely to sell right away / stay in inventory?
 - Study customer's taste based on geo-information to tailor promotion?
 - Many more ...

Algorithms – recommendation, Clustering, and time series

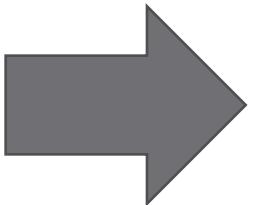
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Data to Business



Predict trend from online media

Online Media



Trend Data with
Timestamp

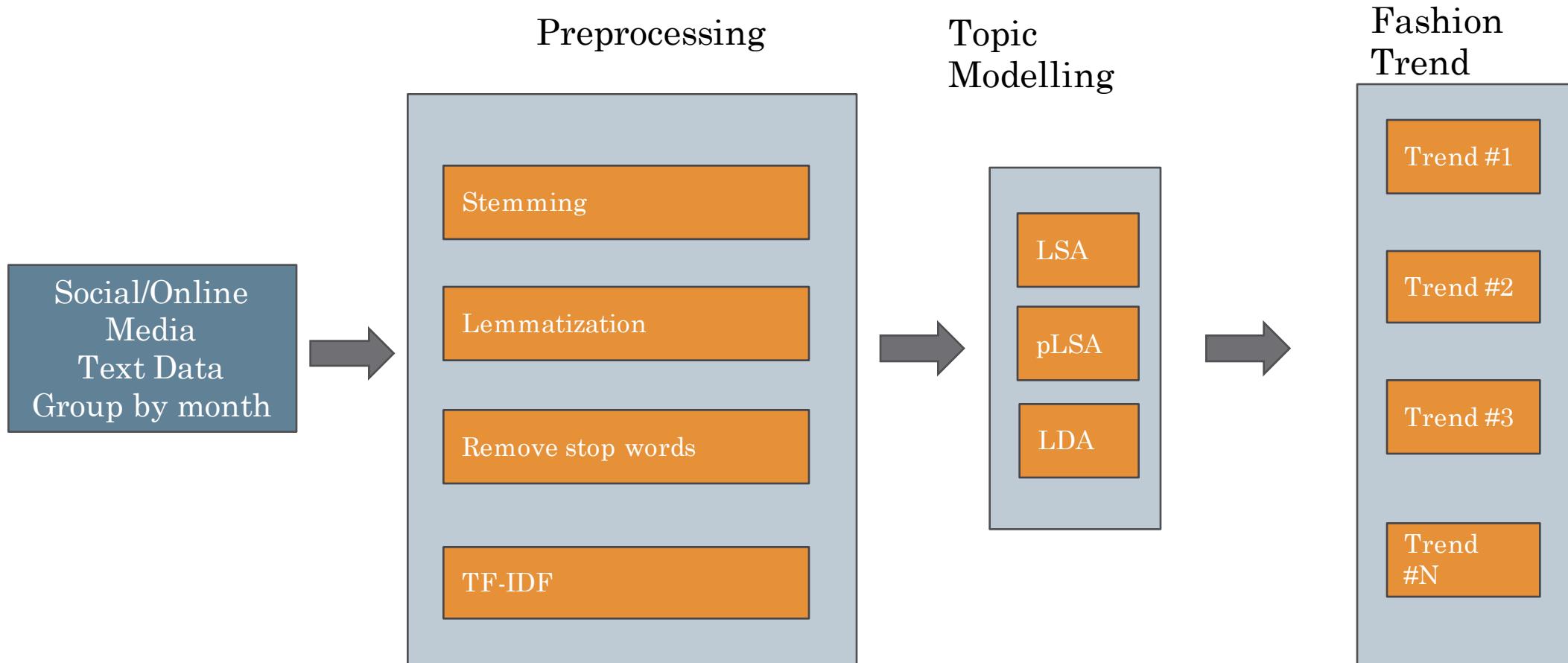


“We are obsessing over these graphic tees for Fall!
Which one is your favorite?!#pinklily
#thepinklilyboutique #graphictees #love#obsessed”

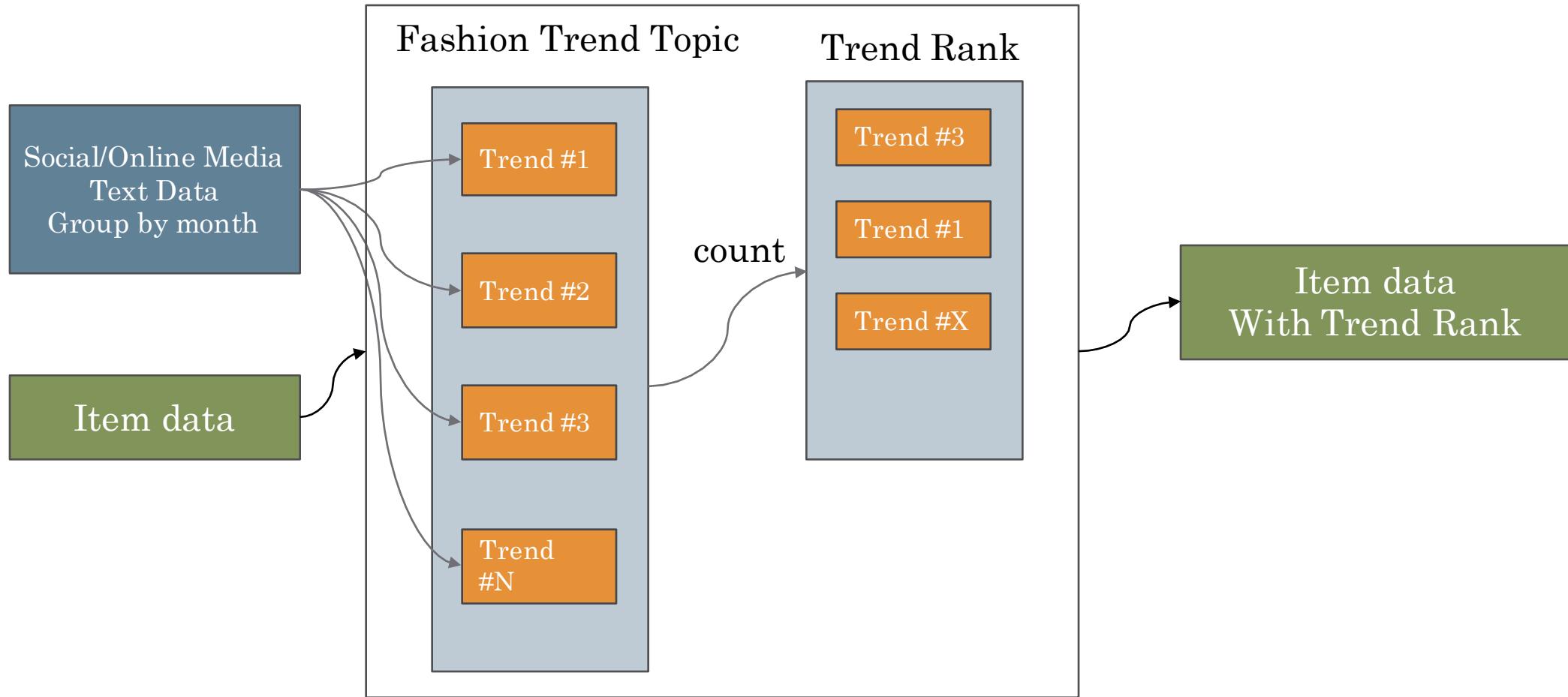
“ It's hard to imagine life without graphic t-shirts.”

“graphic t-shirts sit squarely at the apex of several
different cultural waves”

Proposed trend analysis work process



Proposed trend analysis work process



Machine Learning Models



- Clustering

- Modelling product categories
- K-means, Gaussian mixture...
- Increase signal/noise for model training



- Regression Analysis

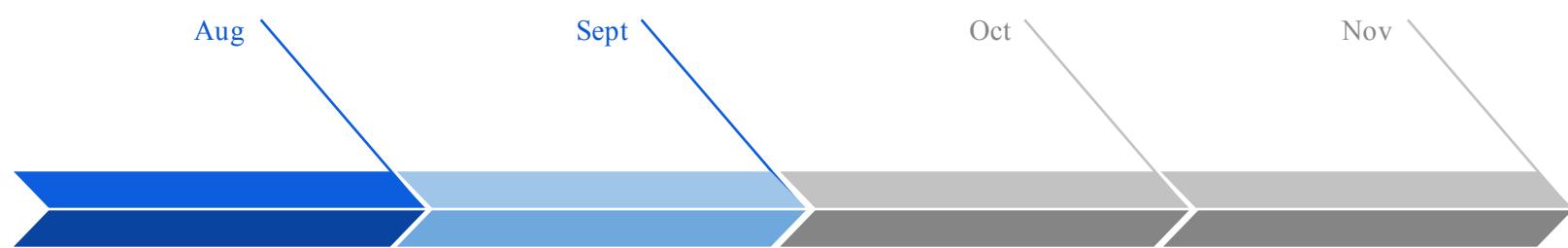
- Target: return rate, price, sell ability
- Random forest, XGboost...
- Allow predicting power



- NLP

- Feature extraction
- Stemming, TF-IDF, RNN ...
- Enable manager to tell the nuances leads to good products selection

Roadmap



Data Preparation

Collect, Clean and EDA

Model Building

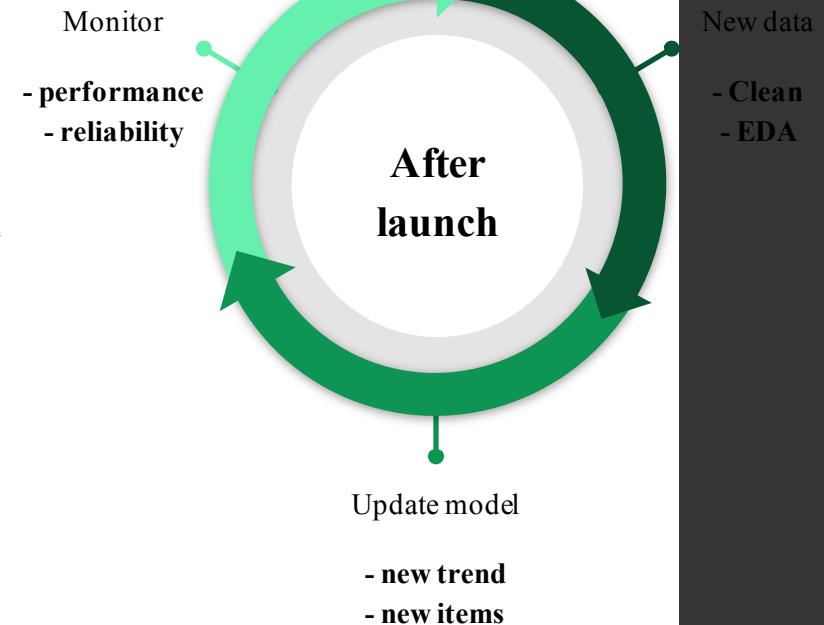
Build initial models,
iterate with clients

Testing

Test based on historical
data and small scale test in
store

Launching

Launch at larger scale and
keeps iterating based on
future data



Optional: Challenge work - Web Scraping

Web scrapping

Nordstrom
(only accessory
section)

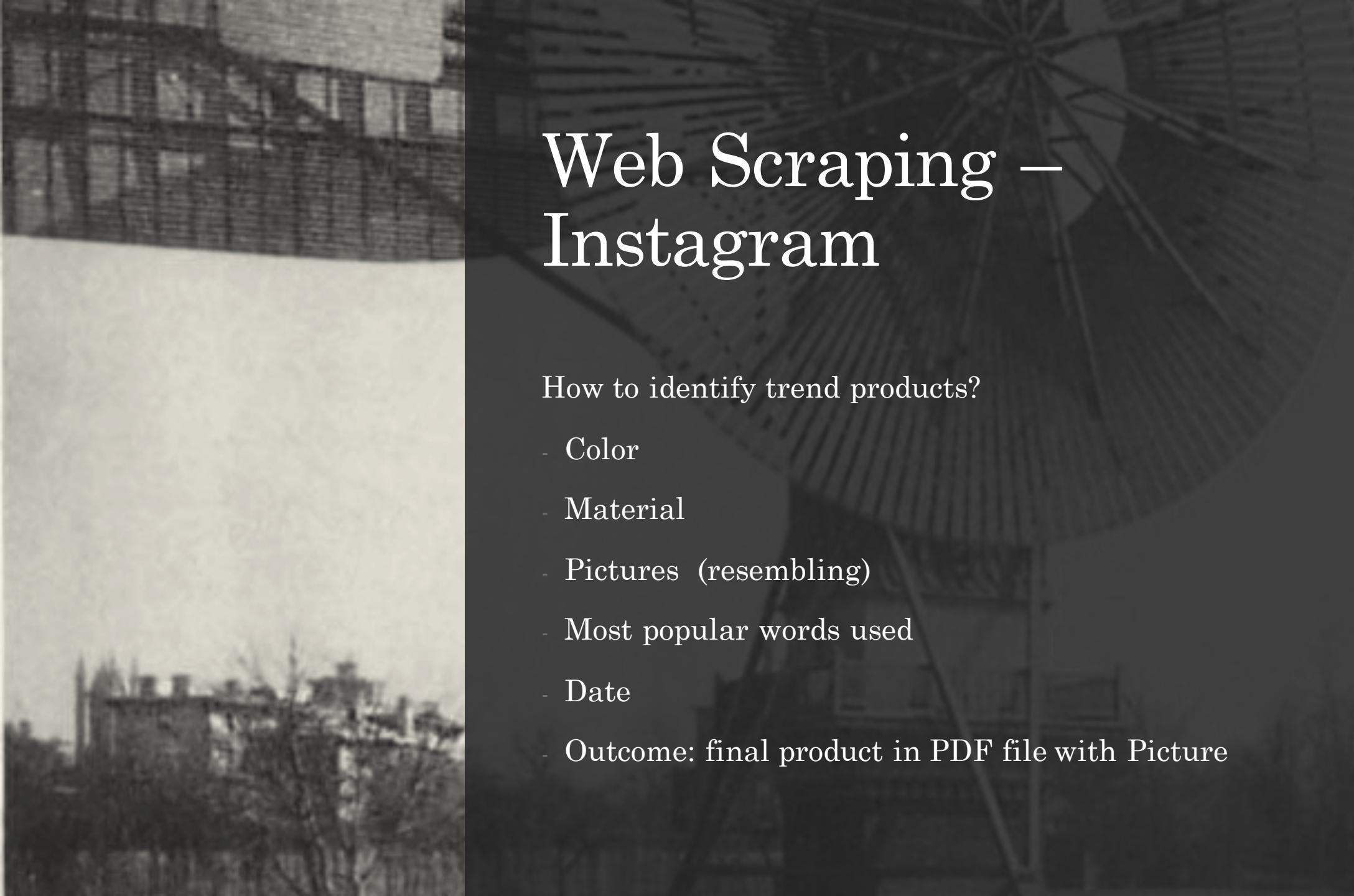
Web Scraping – Department store

Nordstrom

https://shop.nordstrom.com/c/necklaces?origin=topnav&cm_sp=Top%20Navigation--Women--Necklaces

Kohls

https://www.kohls.com/search/fashion-jewelry.jsp?CN=Trend:Fashion+Department:Jewelry&search=necklaces&S=1&PPP=60&cls_sbp=29903189072021914414272337518577493653&pfm=search%20refine



Web Scraping – Instagram

How to identify trend products?

- Color
- Material
- Pictures (resembling)
- Most popular words used
- Date
- Outcome: final product in PDF file with Picture