NOVA IMS Information Management School

Many Gifts UK:
Recommendation System

Group Y:

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Context

- Recommender Systems are crucial to e-commerce and online platforms.

Some popular examples

35 %
Revenue due to RS

33.3 %
Increase in monthly subscriptions thanks to RS

60 %
Amount of clicks due to recommendations

23.7 %
Increase in revenue after adopting RS

Amazon's Choice

Spotify
Cannot be redeemed for the Spotify Family or Student plans. Terms Apply.

YouTube

BEST BUY

Context

- **_Situation:_**

ManyGiftsUK wants correctly recommend items to customers in order to increase sales
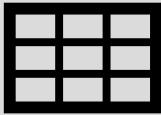
Benefits:

- These recommendations can introduce customers to items previously unknown;
- When faced with easy choices, customers tend to buy more;
- These systems are proven to help increase sales.
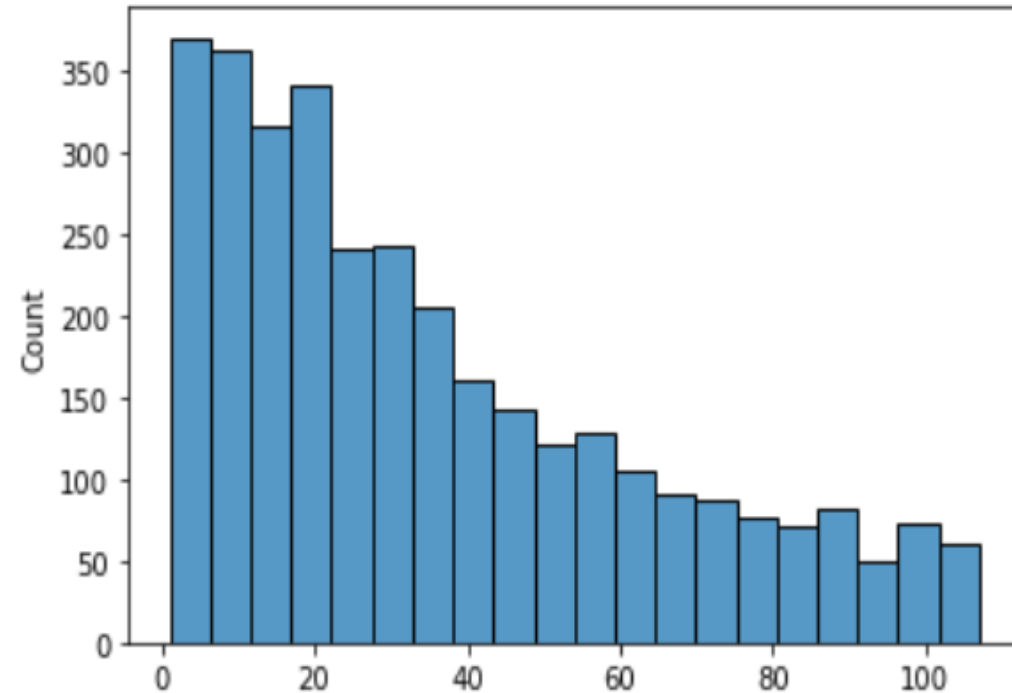
How we going to achieve this:

- Using Collaborative Filtering to implement a Recommender System with Implicit Data

Data Understanding

- 541909 rows
- 8 columns
- 4372 different customers
- 4070 unique items
- 5176450 total items sold
- transactions in between 01/12/2010 and 09/12/2011
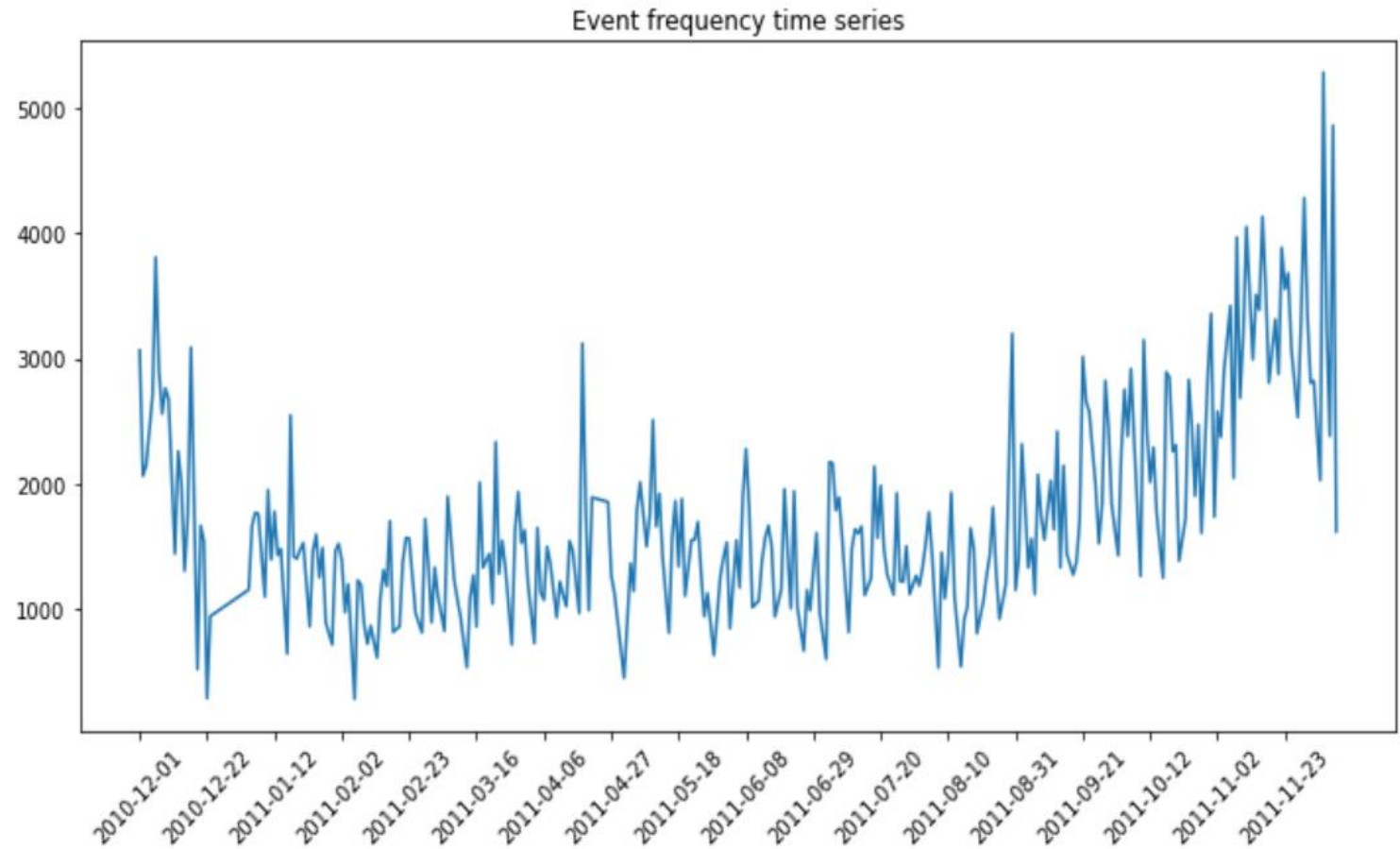- 25900 purchases, 98,36% customers re-order

Histogram of Customers per Number of Invoices

Data Understanding

Seasonality at the end of each year, could be explained by the proximity of Christmas

1-day big spikes can be explained by holidays

Event frequency time series

How did we do it?

Preprocessing:
- Data cleaning
- Removed adjustments in inventory
- Eliminated products that did not have enough items sold or unique user interested

Machine Learning:
- Collaborative Filtering to make predictions using Unsupervised Algorithms

Model evaluation

We applied different algorithms from the Implicit library using a K-fold fashion:

- Logistic Matrix Factorization

- Alternating Least Squares

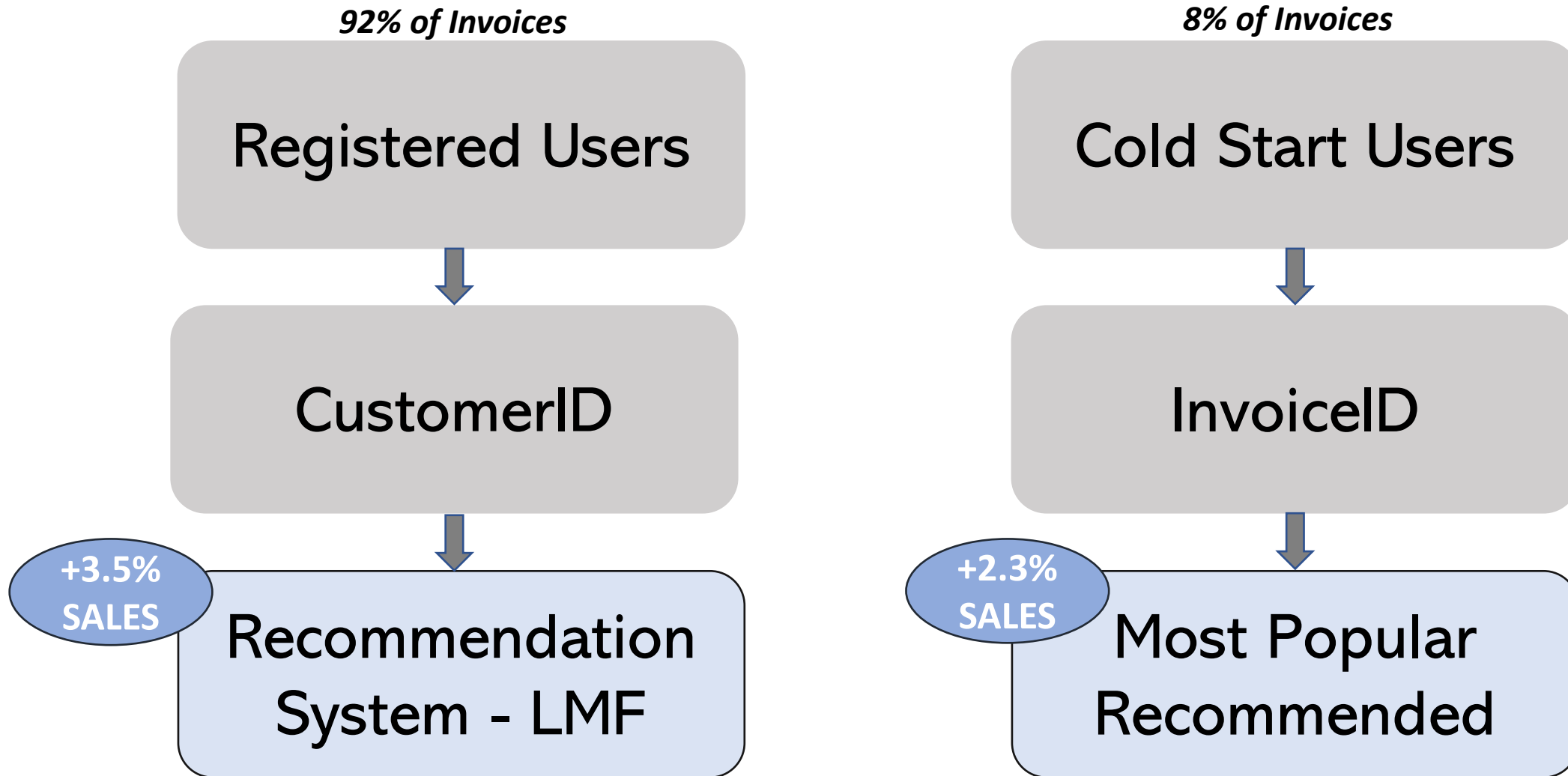- Bayesian Personalized Ranking

- the Popular Naive Recommender

Registered Users

	pop_model	als_model	bayes_model	log_model
precision	0.099680	0.049015	0.057682	0.089361
map	0.049113	0.020124	0.021745	0.038025
ndcg	0.112403	0.050547	0.055736	0.089364
auc	0.521571	0.508786	0.510599	0.517492

Cold Start Users

	pop_model	als_model	bayes_model	log_model
precision	0.281910	0.024793	0.174472	0.101010
map	0.137527	0.005813	0.076364	0.032473
ndcg	0.235188	0.018139	0.153950	0.080198
auc	0.511305	0.498188	0.505730	0.500787

Registered vs. Cold Start Users

92% of Invoices

8% of Invoices

Registered Users

Cold Start Users

CustomerID

InvoiceID

+3.5% SALES

Recommendation System - LMF

+2.3% SALES

Most Popular Recommended

Suggestions

Discount/Gift Card
for New Users

↓

Bigger Customer
Data Platform

↓

Better Recommender
System

Review of Purchased
Products

↓

Recommender System
with Explicit Data

↓

Better Recommender
System

Thank you!