Project Proposal – Group 6

Creating Supply Chain Efficiencies:
Assisting Warehouse Ordering by Predicting Sales

Team Members

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Project Description

This project aims at creating an efficient supply chain process for an anonymous company by analyzing the Purchase and Sales data for office products. This company acts as a distributor by purchasing the office products from manufacturers, holding them and then reselling them to its business customers.

The purpose of the project deliverable is to add more automation to the product ordering process based on the demand, inventory at hand, and shipment times. Another objective is to help identify the products that are highest contributor to overall sales and prioritize them to increase the company's overall profitability.

The project objective will be achieved by completing time series analysis. This analysis uses the following methods:

- Moving Averages
- Exponential Smoothing
- AutoCorrelation Function (ACF)
- Partial AutoCorrelation Function (PACF)
- AutoRegressive model
- SARIMAX (Machine Learning model)

This project outcome will assist in making predictions for the optimal order quantities for each product category to achieve the highest profitability.

Target Audience

The intended target audience who will benefit from this project will be the following company officials:

- Supply Chain team with focus on Procurement

Data Sources

The data used for this project comes from CSV files obtained from the company. The original data has been anonymized for the purpose of this project. The CSVs have 5-years worth of data (2018 to 2022) for Purchase, Sales and Products.

Platforms Used:

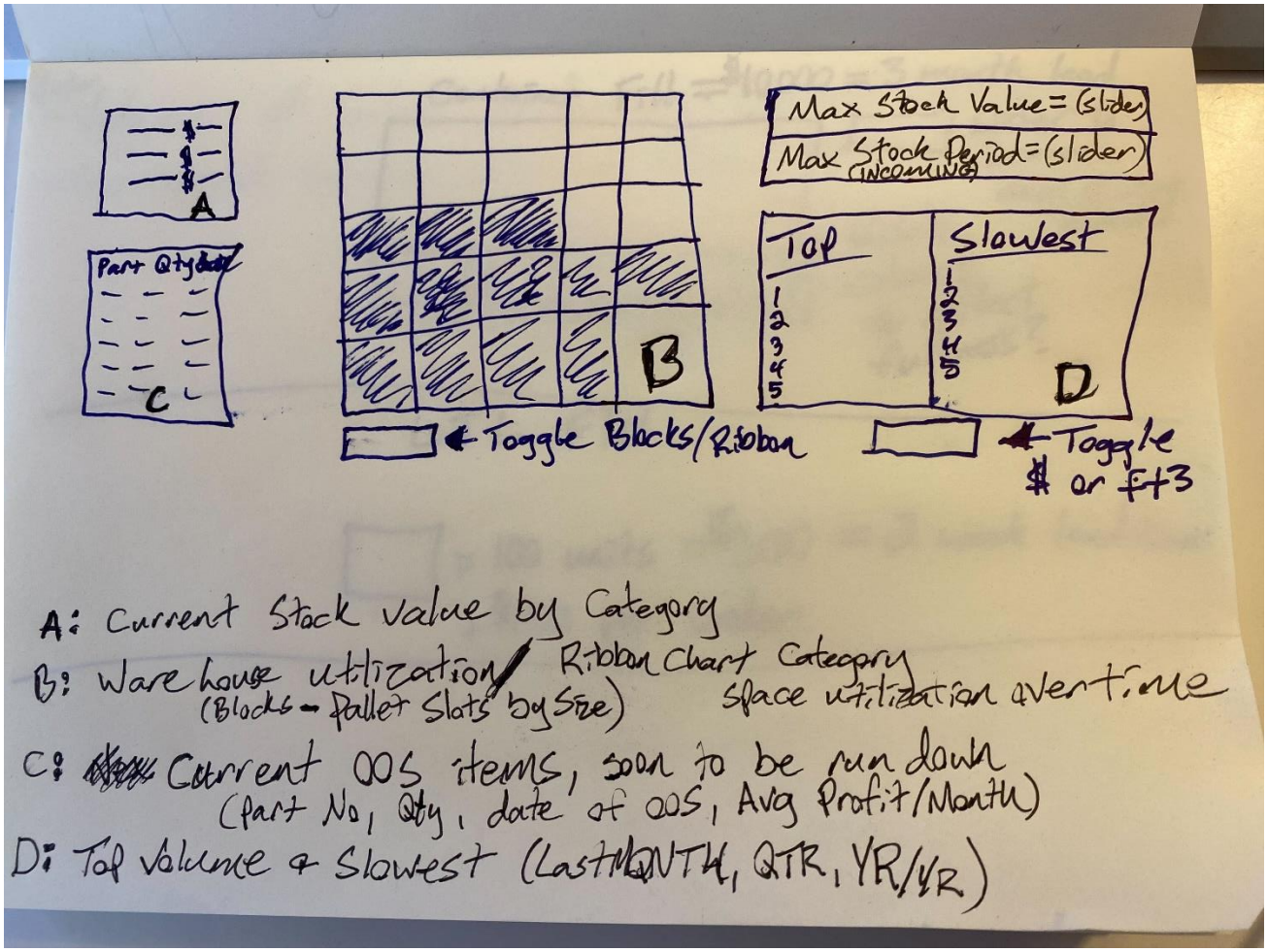
The following platforms will be used for ETL, machine learning and creating the dashboard:

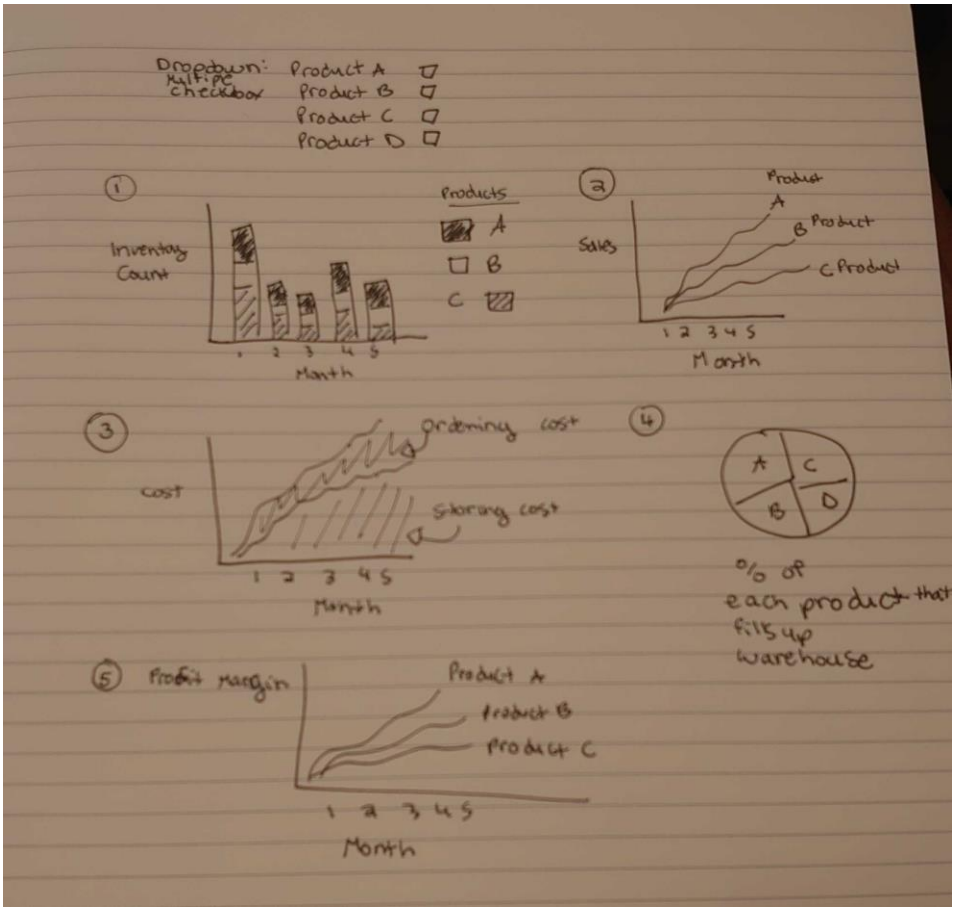
- PySpark for ETL

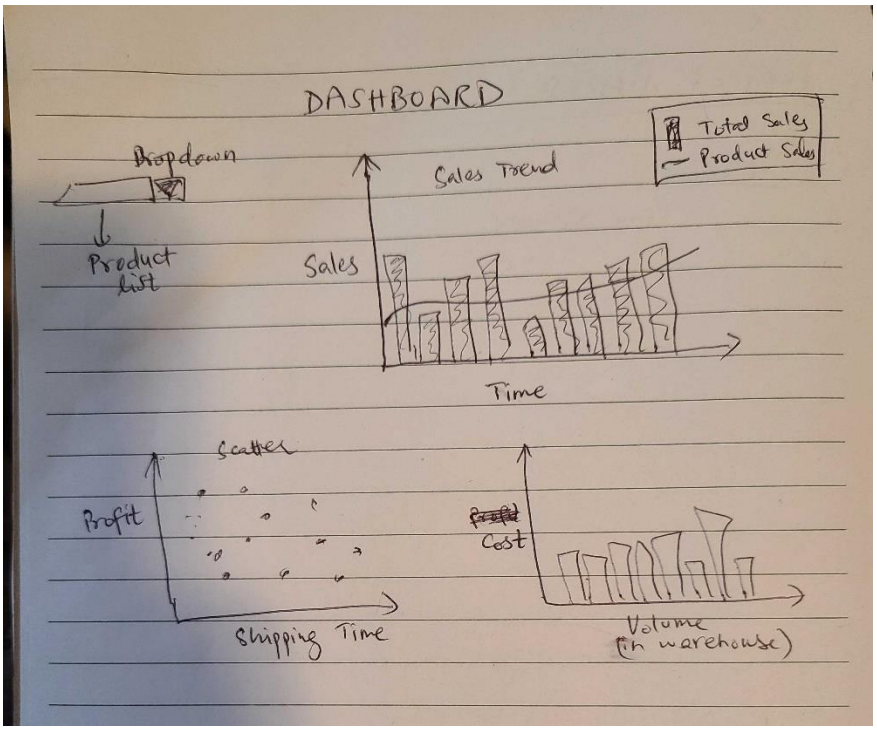
- Amazon AWS for hosting the data
- Python for Time Series analysis, Machine Learning models and optimization
- Python Model and JavaScript for visualizations
- HTML/CSS/Bootstrap for dashboard

Napkin Drawings:

Following are some napkin drawings we created to give an idea about what the dashboards will look like:




Dropdown: Multiple checkbox
Product A
Product B
Product C
Product D
1
Inventory Count
Products
A
B
C
1 2 3 4 5
Month
2
Sales
Product A
Product B
Product C
1 2 3 4 5
Month
3
cost
ordering cost
storing cost
1 2 3 4 5
Month
4
A
C
B
D
% of each product that fills up warehouse
5
Profit margin
Product A
Product B
Product C
1 2 3 4 5
Month


DASHBOARD
Dropdown
Product list
Sales Trend
Total Sales
Product Sales
Sales
Time
Scatter
Profit
Shipping Time
Cost
Volume (in warehouse)