



ANALYZING OF BOXIFY DATASET

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INTRODUCTION

- Objective-:

1. Cleaning the Data
2. Analyze Sales Data to Derive Insights
3. Calculate Inventory Performance Metrics
4. Provide Actionable Recommendations
5. Visualize Insights Effectively

METHODOLOGY

- Data Preprocessing:
 - Checked for missing values and duplicates.
 - Structured data for analysis.
- Exploratory Data Analysis (EDA):
 - Sales trends, top products, low-stock items.
- Metrics Calculated:
 - Inventory Turnover Ratio, Stock-to-Sales Ratio.
- Recommendations based on findings.

CLEANING THE DATA

Data cleaning is a critical step in ensuring the accuracy and reliability of the analysis. For this project, the cleaning process involved the following key steps:

1. Checking the Duplicates in dataset.

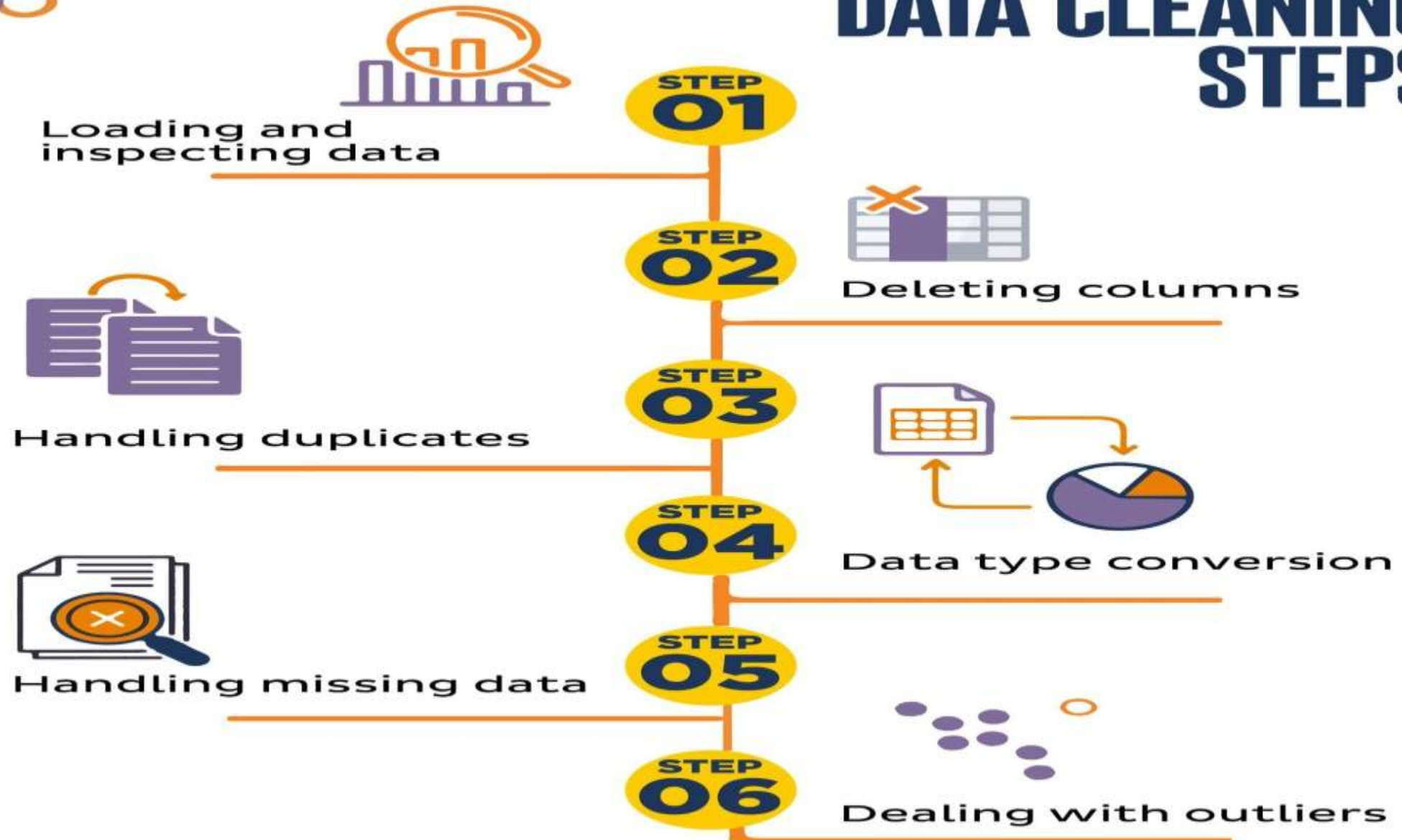
→ We have to check that is any duplicate rows or matching rows are in given dataset but in my project no any duplicates are found. If we got any duplicates then we use “dropna()” function to handle it.

2. Checking the null values (missing values) and handle it.

→ After checking the duplicates we checked that is any column consists null values and this time we got 2 columns that have null values. So we handle the null value by filling 0 at the place of null values



DATA CLEANING STEPS



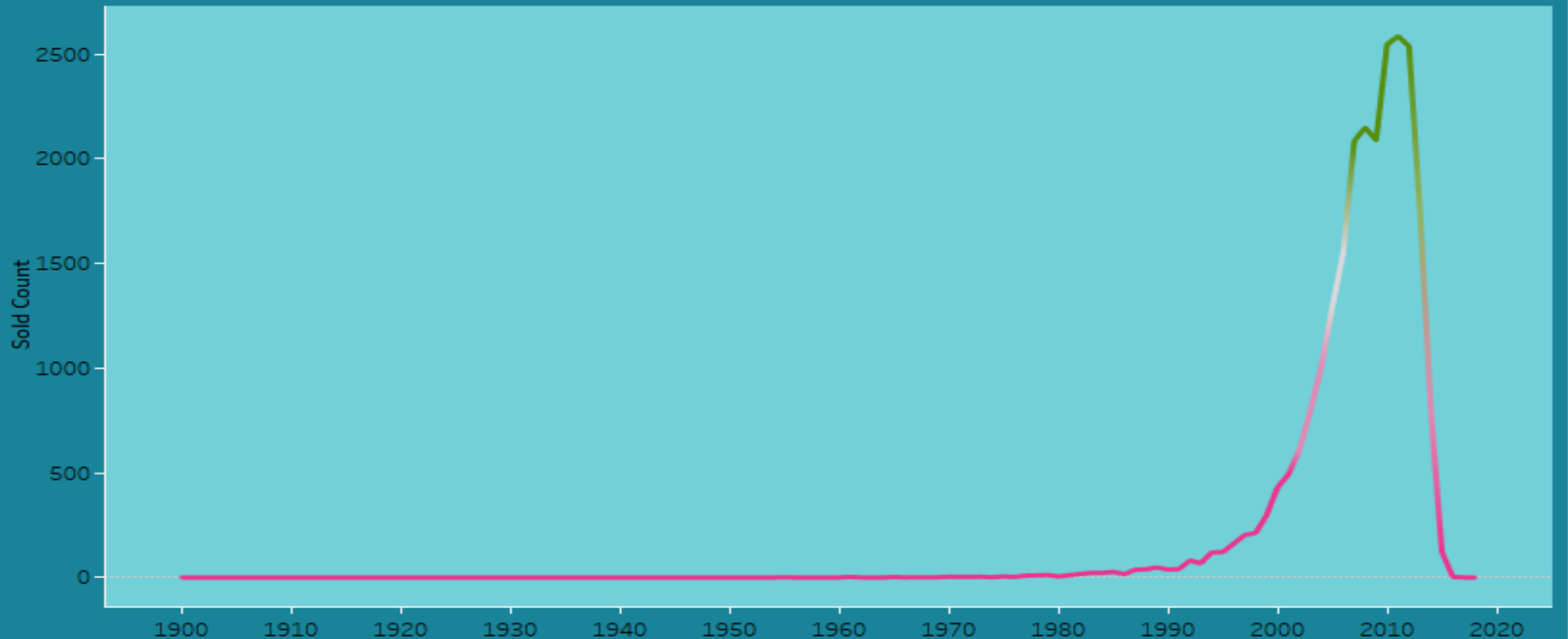
ANALYZE SALES DATA TO DERIVE INSIGHTS

1.Examine sales trends over time to understand seasonal or long-term demand patterns.

→ In this part we find that how many items sold in which year and make a line chart to make more easy to understand and for the seasonal or long-term demand we made another column named seasonal trends in which we show that if the no of items sold per year is less than 20 then it is downfall year and the no of items sold per year is greater than 20 and less than 200 then it is average year and the no of items sold in per year is more than 200 then Profitable year.

SALES TRENDS CHART

Sales trends and variations over time

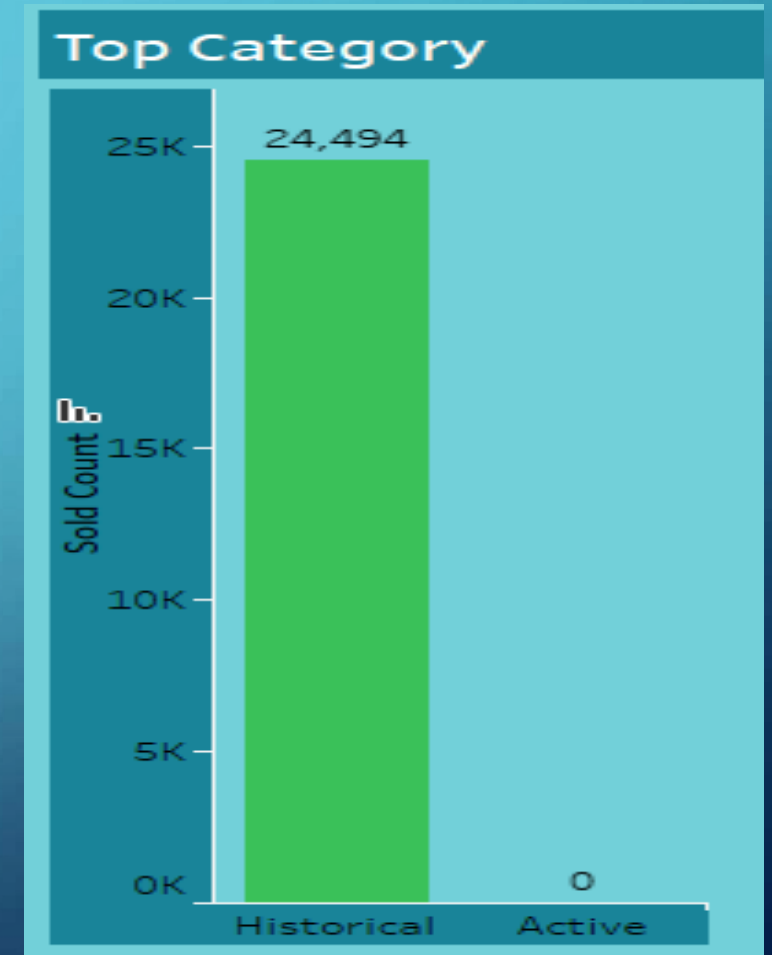
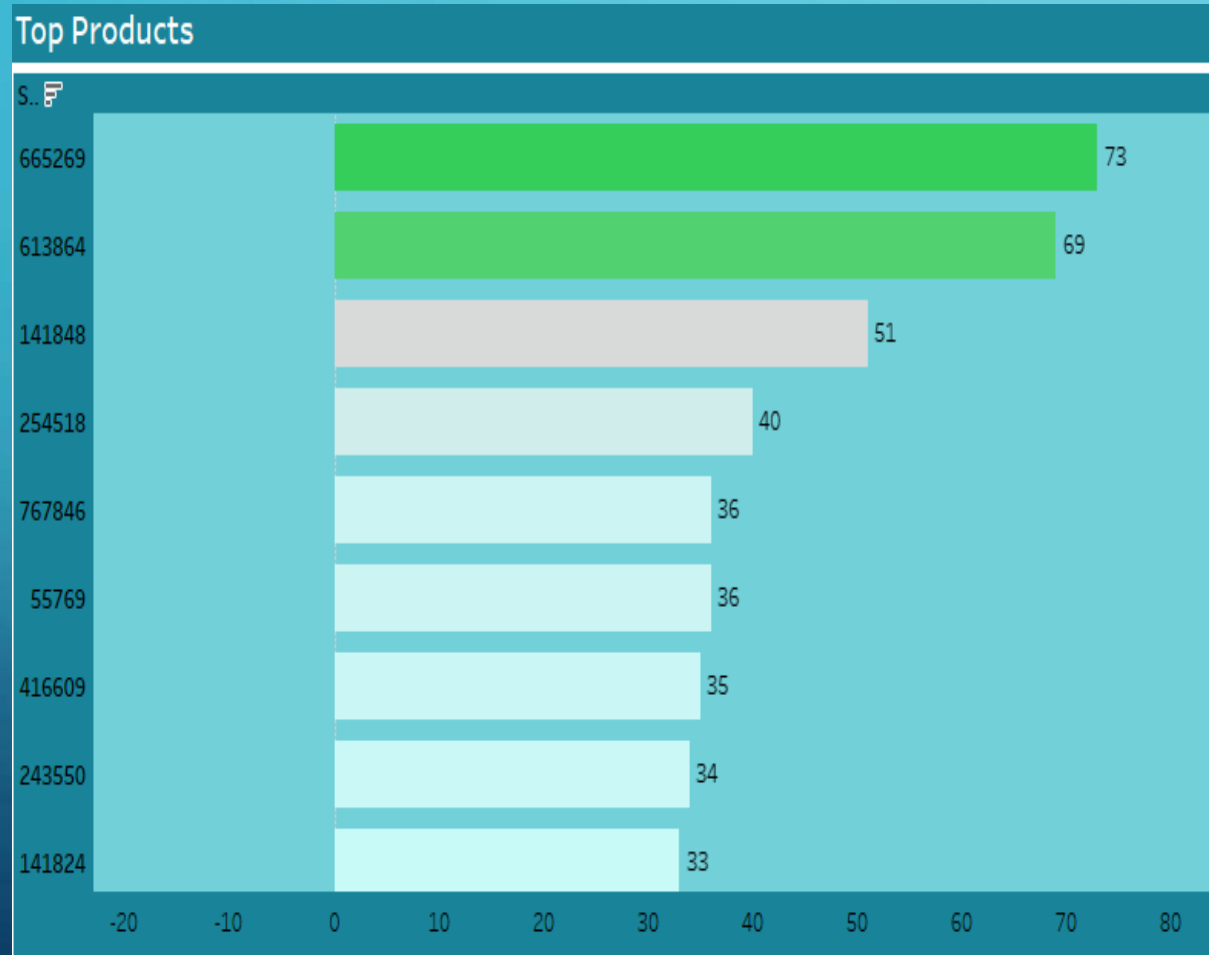


ANALYZE SALES DATA TO DERIVE INSIGHTS

2. Top selling products and categories

- In top selling product part I found that top 10 SKU_numbers for which the most items was sold in given dataset.
- In top categories part I found that for which category the most item was sold in given dataset.

TOP PRODUCTS AND CATEGORIES CHARTS



ANALYZE SALES DATA TO DERIVE INSIGHTS

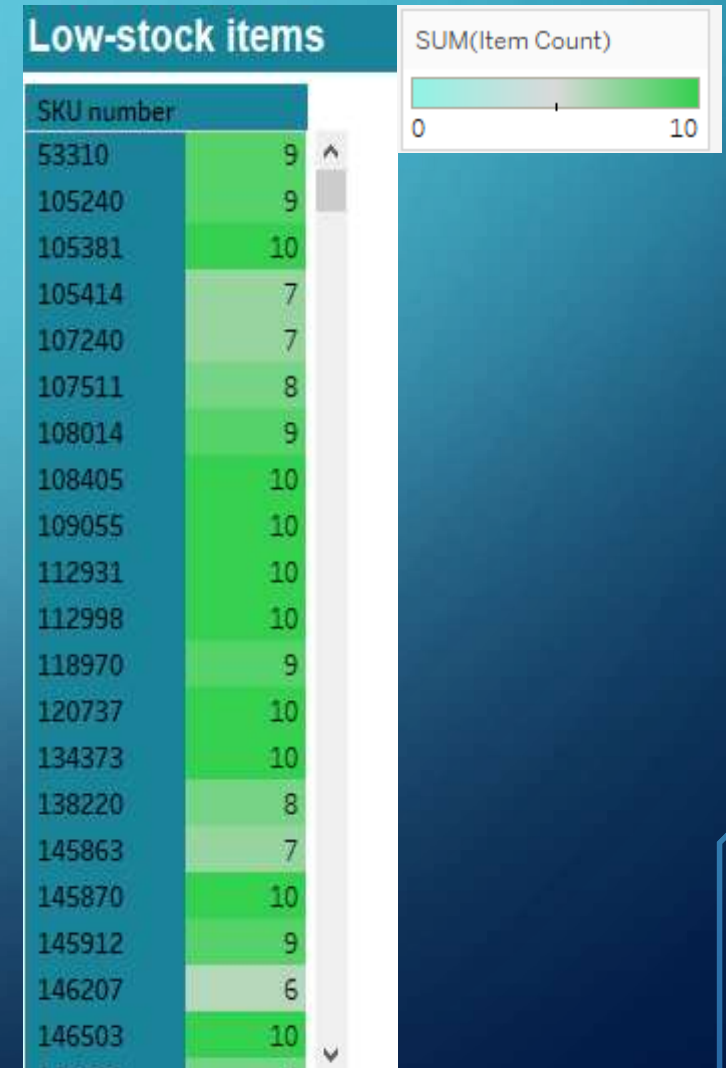
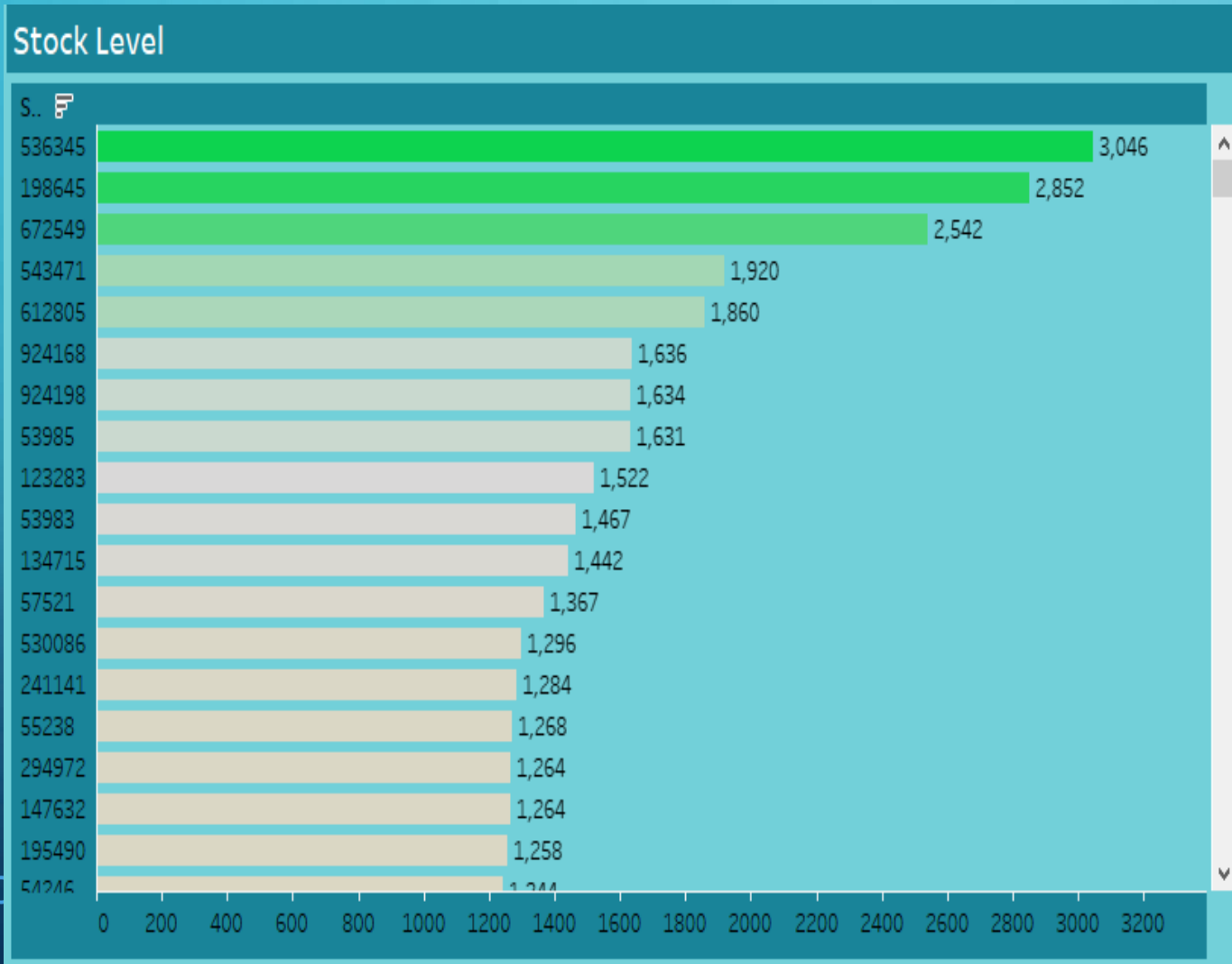
- **Stock level and Low stock items**

→ In stock level part I found that for which sku_numbers how many total items are available and convert it into a descending order to make more easy to understand for any person.

- **Low stock items**

→ In this part I found the low item count for per SKU_number and set a limit (threshold) which is 10 and after analyze it that if item count is less than my limit then it is low stock item and shown in the chart and if it's out of the limit its not showing in chart

STOCK LEVEL AND LOW STOCK CHARTS



CALCULATE INVENTORY PERFORMANCE METRICS

1. Inventory Turnover

→ It is a key performance metric that measures how efficiently a company sells and replaces its inventory over a given period. It indicates the number of times inventory is sold or used during that timeframe.

→ To find the inventory turnover

Inventory turnover = Total Sales / Average Inventory

Average inventory = Average of total item count

CALCULATE INVENTORY PERFORMANCE METRICS

1. Stock to Sales ratio

→ It measures the amount of inventory a business holds compared to the volume of sales it generates. This ratio helps businesses evaluate whether their inventory levels are aligned with sales performance.

➡ To find stock to sales ratio

$$\text{Stock to sales ratio} = \text{Average Inventory} / \text{Total sales}$$

CALCULATE INVENTORY PERFORMANCE METRICS

3. Reorder Point

→ It is the inventory level at which a business should reorder stock to avoid running out of inventory. It ensures that new stock arrives before existing stock is depleted, considering demand during the replenishment period.

I set the lead days is 7 and in our data set sales show in year wise so we get average daily sales by dividing total sales by 365.

→ **To get reorder point(ROP)**

$\text{ROP} = \text{Average daily sales} * \text{Lead days}$

$\text{Average daily sales} = \text{Total Sales} / 365$

PROVIDE ACTIONABLE RECOMMENDATIONS

1. In first parts of this I make top products to high demand products and convert top products into a sentence like “Ensure sufficient stock levels for SKU XXXXXX is high Demand Products” to make into a readable format.
2. In second part I make low stock items recommendation by using SKU_numbers and item count and make a sentence like “Reorder SKU XXXXXX as current stock (no of items which is below to the threshold) is low demand product” for easy to understand.

VISUALIZE INSIGHTS EFFECTIVELY

For Visualize this project I use one of the most popular visualization tool Tableau and make a chart to compare all the things which is given in questions.

1. Sales Trends and variation over time

Visualization Type: Line Chart

Purpose: sales trends over years.

Example:

x- axis: Years

y- axis: Sold Count

VISUALIZE INSIGHTS EFFECTIVELY

2. Top Selling Products and Categories

Visualization Type: Bar chart(top Products), Column Chart(Categories)

Purpose: Identify top-performing products or categories.

Top Products

x- axis: Sold Count

y- axis: SKU_number

Top Categories

x- axis: File Type

y-axis: Sold Count

VISUALIZE INSIGHTS EFFECTIVELY

3. Stock levels and Low-stock items

Visualization Type: Bar Chart

Purpose: To find the no of items are available.

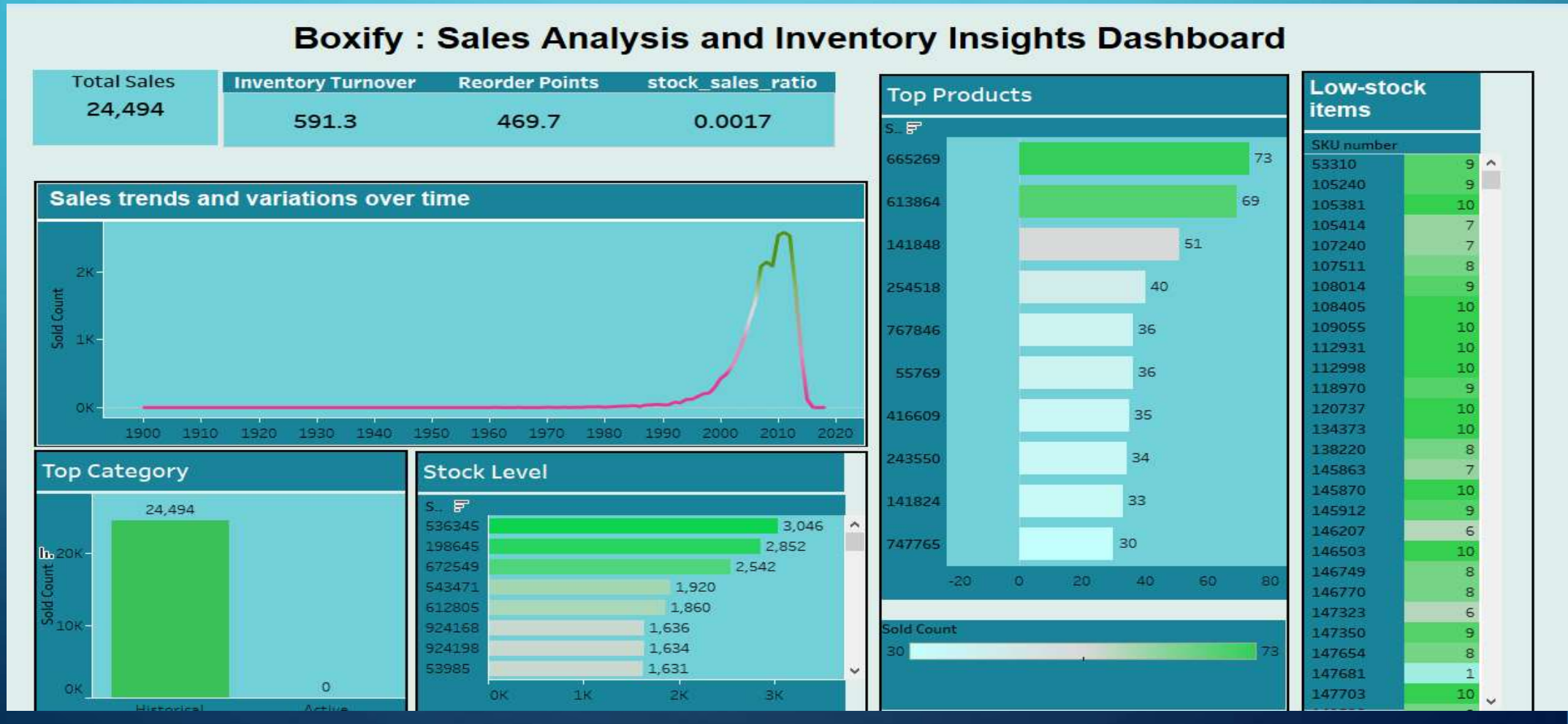
x-axis: Item Count

y-axis: SKU_number

:: For Low Stock item I make a table and colored it by in increasing order

VISUALIZE INSIGHTS EFFECTIVELY

After all I make a attractive dashboard where I mentioned all the charts and all the values which is needed for this project.



thank you