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Cloud Computing for Retail Businesses

Overview of Cloud Advantages, IaaS, PaaS, SaaS,
and Security

Key Advantages of Cloud Computing

- Scalability: Adjust resources for high-traffic events.
- Cost Efficiency: Pay for what you use.
- Data Security & Backup: Built-in security features.
- Faster Deployment: Quickly launch new stores and campaigns.
- Enhanced Customer Experience: Use AI and data analytics.

IaaS, PaaS, SaaS Explained

- IaaS: Rent virtual servers (e.g., Amazon EC2).
- PaaS: Build apps without managing servers (e.g., Google App Engine).
- SaaS: Use software without managing backend (e.g., Shopify).

How Auto-Scaling Helps

- Auto-scaling adjusts server capacity during high-traffic events.
- Prevents crashes, ensures performance.
- Example: Toy store uses AWS Auto Scaling during Christmas sales.

Security Concerns with Cloud

- Data Encryption: Protects customer data.
- Access Control: Restricts access with passwords and multi-factor authentication.
- Compliance: Follows standards like PCI DSS.
- Example: Electronics retailer uses TLS encryption.

On-Premise vs. Cloud Deployment

- Cost: Cloud is pay-per-use; on-premise has high upfront costs.
- Scalability: Cloud easily scales, on-premise is limited.
- Maintenance: Cloud is managed by providers.
- Disaster Recovery: Cloud has built-in backup and recovery.

API Development

Model Selection: Falcon-7B-instruct : Lightweight, instruction following model and computationally efficient.

API Creation: Created using FASTAPI which is a high performance web framework.

End Points:

Chatbot: Receives customer queries and provides product recommendations.

Feedback: Collects feedback to improve the chat bots accuracy.

Data Processing: Data was loaded and processed using techniques such as tokenization, lemmatization and stop word removal .

API Development

Fine tuning and Optimization: Fine tuning the chatbot involves adjusting the model based on dataset of customer queries.

Alteryx-Based Data Analytics on Retail Sales & Inventory

Introduction

- **Objective:** Provide insights into sales trends and inventory levels for optimal stock management.
- **Tools Used:** Alteryx Designer
- **Datasets:**
 - Retail Sales Data (Sales amount, Region, Product ID, Customer Category)
 - Inventory Data (Stock Level, Reorder level, Supplier Details)

Sales & Inventory Analysis

1. Top-Selling Products:

- Analyse sales by region to identify top-selling products.

2. Stock Availability:

- Compare stock quantity to reorder level.
- Identify products at risk of stockouts.

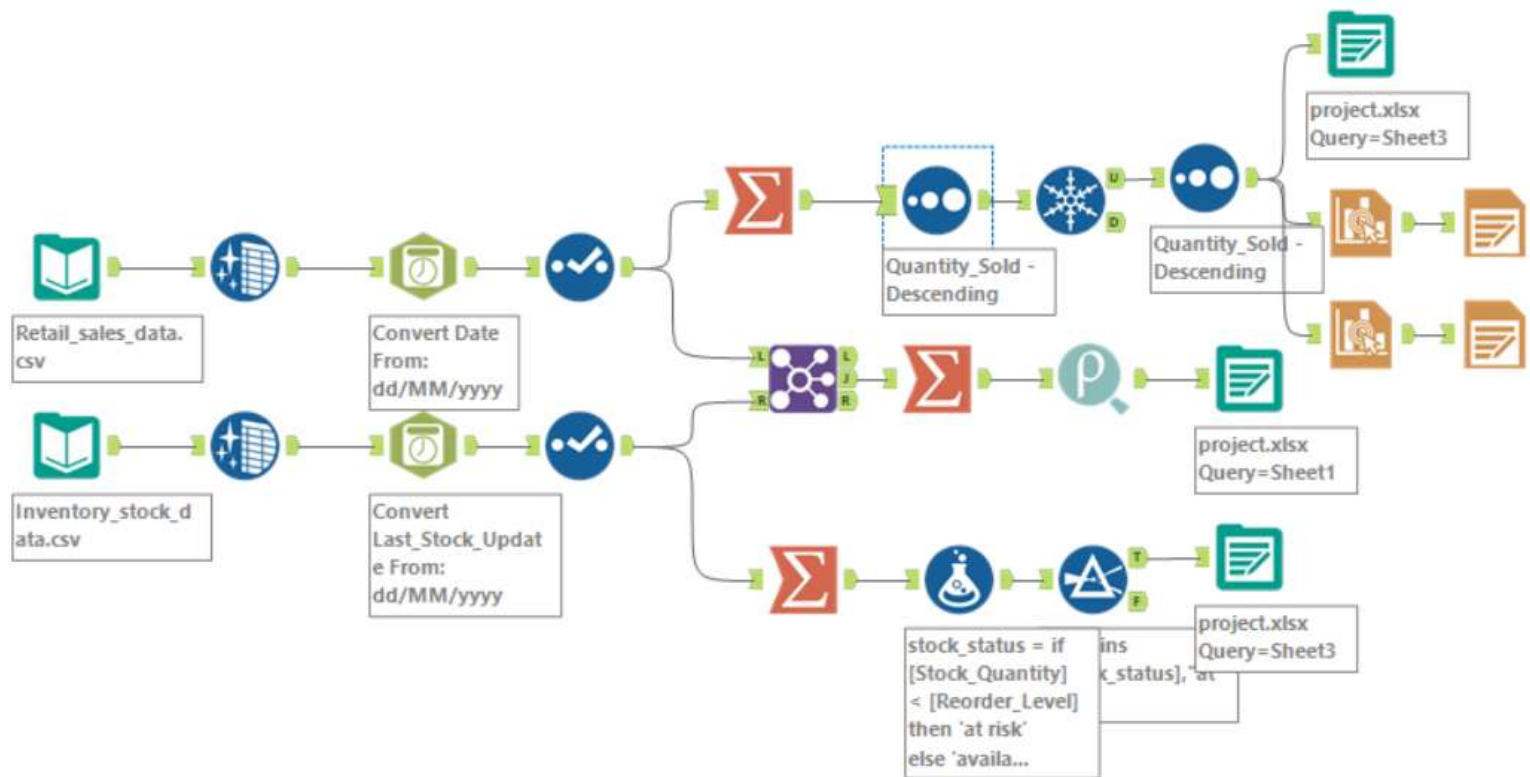
3. Correlation Analysis:

- Analyse trends between sales amounts and inventory levels.

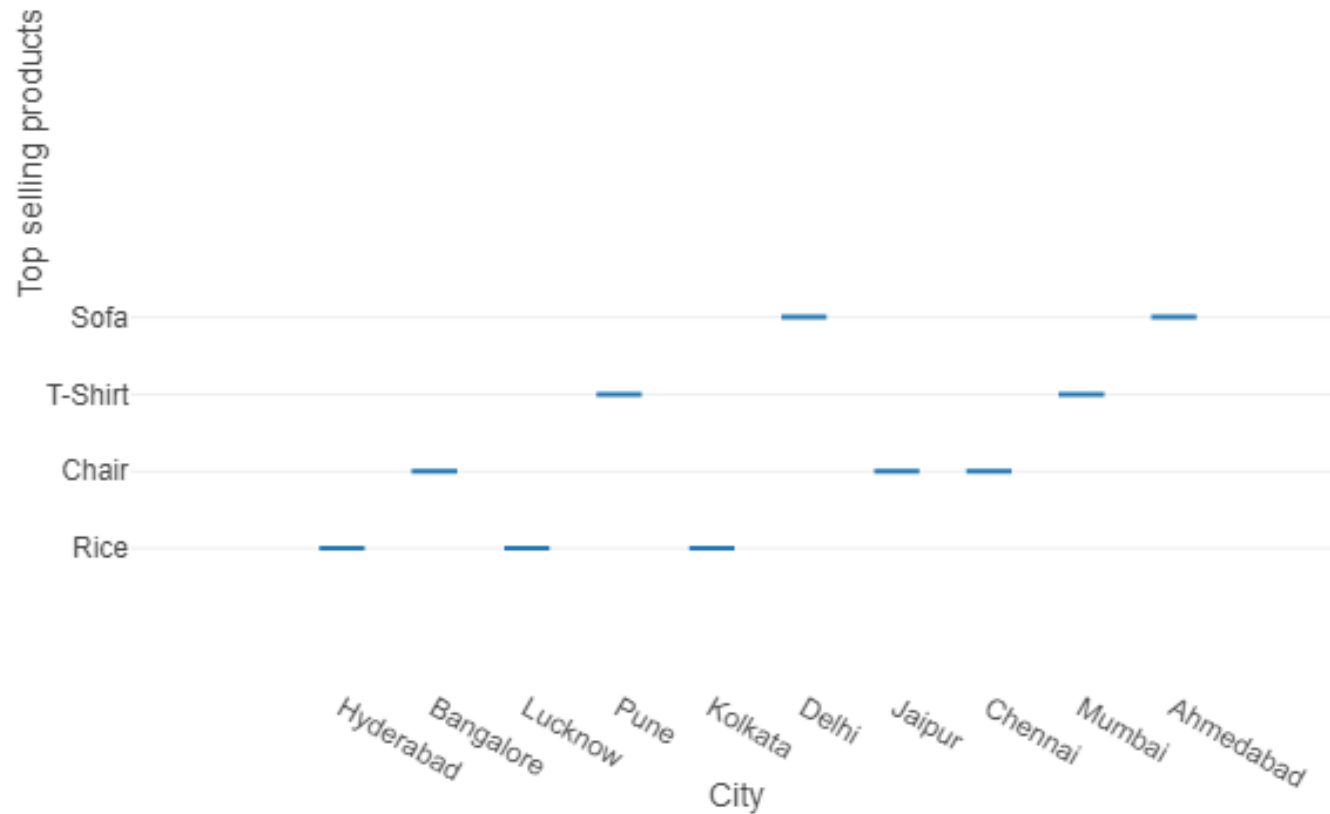
Workflow Overview

- Load Datasets
- Data Cleaning & Preparation
- Sales & Inventory Analysis
- Correlation Analysis
- Generate Report Output

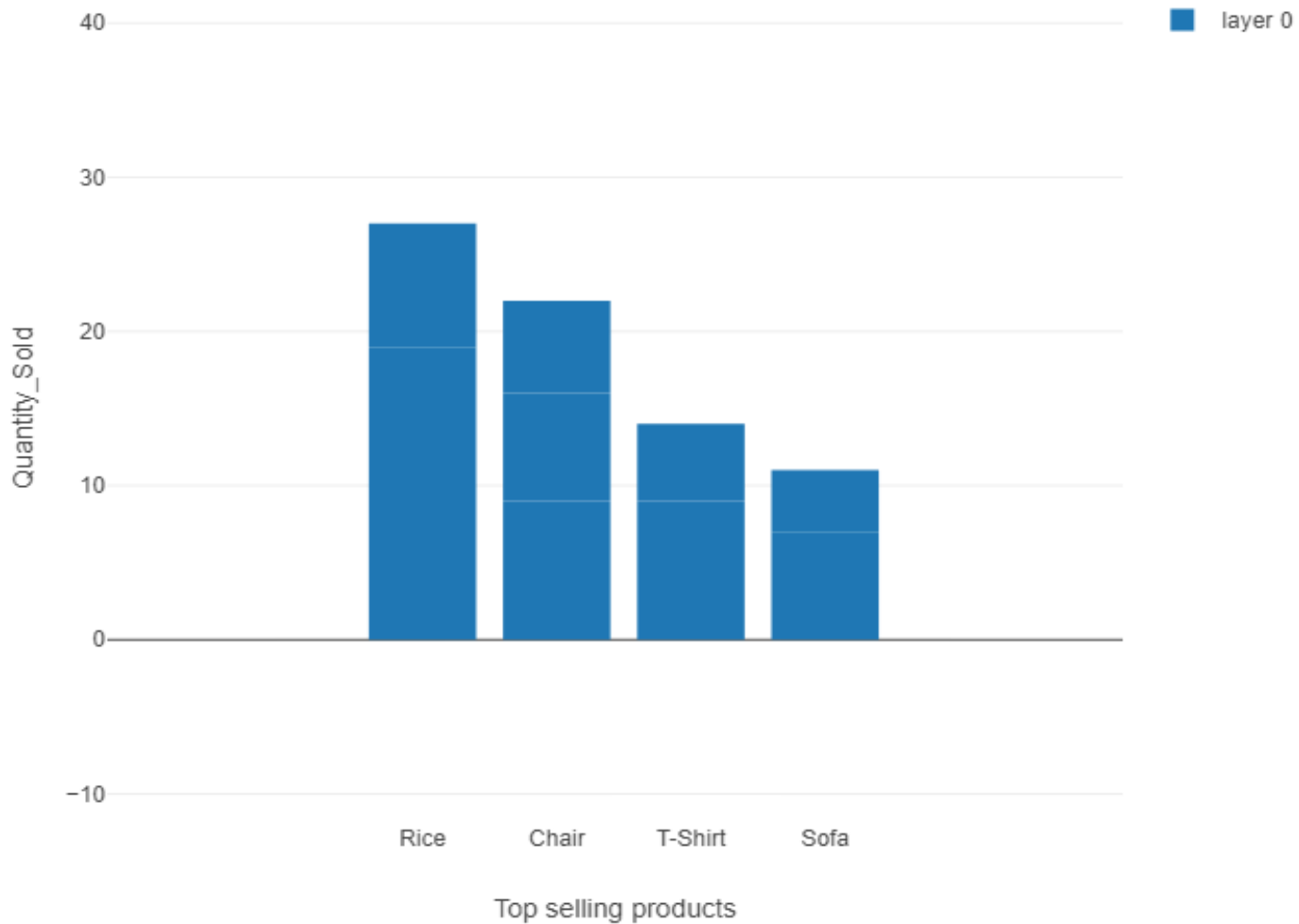
Workflow Diagram



City vs Top Products



Top Product vs Quantity Sold



Overall Output

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THANK YOU