# Supply Chain Management Dashboard Documentation

## Overview

This documentation covers two Python scripts that together create an advanced Supply Chain Management Dashboard:

1. `Generate sample data for the dashboard.py`

2. `Supply Chain Management Dashboard.py`

These scripts work together to create a comprehensive dashboard for analyzing and visualizing supply chain data.

1. Generate sample data for the dashboard.py

#Purpose

This script generates synthetic supply chain data for demonstration and testing purposes.

# Key Features

- Generates 365 days of supply chain data

- Includes the following metrics:

- Order volume

- Inventory levels

- Shipping delays

- Supplier reliability

- Customer satisfaction

- Incorporates seasonal trends and random variations

- Adds specific anomalies to simulate real-world scenarios

# Usage

1. Run the script to generate a CSV file named 'supply\_chain\_sample\_data.csv'

2. The generated data can be used as input for the main dashboard application

# Key Functions

- `generate\_supply\_chain\_data(n\_days=365)`: Generates the synthetic data

## 2. Supply Chain Management Dashboard.py

# Purpose

This script creates an interactive Dash application for visualizing and analyzing supply chain data.

# Key Features

- Data upload functionality

- Multiple dashboard views:

- Main Dashboard

- AI Insights

- Real-time Tracking

- Supplier Network

- Chatbot Assistant

- Interactive graphs and visualizations

- AI-driven disruption prediction

- Global supply chain activity map

- Supplier network visualization

- Chatbot for user assistance

# Dependencies

- dash

- dash-bootstrap-components

- pandas

- plotly

- numpy

- scikit-learn

- dash-leaflet

- dash-cytoscape

# Main Components

1. Data Upload

- Allows users to upload their own CSV or Excel files

- Falls back to simulated data if no file is uploaded

2. Main Dashboard

- Displays key metrics over time:

- Order volume

- Inventory levels

- Shipping delays

- Customer satisfaction

3. AI Insights

- Uses Isolation Forest algorithm to predict supply chain disruptions

- Visualizes predictions in a scatter plot

4. Real-time Tracking

- Displays a global map with simulated supply chain locations

5. Supplier Network

- Visualizes the supplier network using a graph structure

6. Chatbot Assistant

- Provides a simple interface for users to ask questions about the supply chain

# Key Functions

- `update\_output()`: Handles file uploads and data processing

- `update\_main\_graphs()`: Updates the main dashboard graphs

- `update\_disruption\_prediction()`: Generates the AI insights graph

- `update\_supply\_chain\_map()`: Creates the global supply chain activity map

- `update\_supplier\_network()`: Generates the supplier network visualization

- `chatbot\_response\_callback()`: Handles chatbot interactions

# Running the Application

To run the dashboard:

1. Ensure all dependencies are installed

2. Run the script

3. Open a web browser and navigate to the URL provided in the console output (typically http://127.0.0.1:8050/)

# Customization

The dashboard can be customized by modifying the layout, callbacks, or adding new components as needed. The modular structure allows for easy expansion of functionality.