Project:

**Business Objective:** To minimize inventory-related operational costs and lost sales opportunities by accurately predicting whether a product is at risk of stockout or overstock. This prediction enables proactive decision-making in procurement, demand planning, and supply chain management, thereby optimizing service levels and reducing holding and shortage costs.

**Our company wants to improve the efficiency of our inventory management system. Currently, we suffer from both excess stock (leading to high holding costs) and frequent stockouts (leading to missed sales and poor customer satisfaction). We need a predictive system that can flag items at risk of overstock or stockout, allowing procurement and supply chain teams to take timely corrective action.”**

**Data Set Details:**

* Name: Stock Risk Prediction Dataset
* Size: 5,000 rows × 11 columns
* Type: Tabular data
* Format: Excel (.xlsx)
* Target Column: stock\_status (binary: stockout, overstock)

| **Column Name** | **Description** | | |
| --- | --- | --- | --- |
| current\_stock | Current stock available in inventory (units) | | |
| avg\_daily\_demand | Average daily demand of the item (units/day) | | |
| lead\_time\_days | Number of days it takes to receive stock after ordering | | |
| reorder\_point | Threshold level at which new stock should be ordered (units) | | |
| sales\_last\_30\_days | Total quantity of the item sold in the past 30 days | | |
| stock\_turnover\_ratio | How often the inventory is turned over (sales/inventory) | | |
| forecast\_error | Deviation between predicted and actual demand (units) | | |
| season | peak, off-peak | Seasonal classification |
| item\_category | essential, non-essential | Business-critical or not |
| supplier\_reliability | high, low | Supplier's delivery reliability |

**Target Column**

|  |  |  |
| --- | --- | --- |
| stock\_status | stockout, overstock | Binary label indicating inventory risk type |

**Acceptance Criterion:** Need to deploy the end results using Streamlit etc.

**Milestones:**

30 days to complete the Project

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Duration** | **Task start - End Date** |
| Kick off and Business Objective discussion | 1 day |  |
| Data set Details | 1 Week – 1 ½ week |  |
| EDA | 1 Weeks – 1 ½ week |  |
| Model Building | 1 Week – 1 ½ week |  |
| Model Evaluation | 1 Week |  |
| Feedback |
| Deployment |  |
| Final presentation | 1 day |  |

Protocols:

1. All participants should adhere to agreed timelines and timelines will not be extended.
2. All the documentation – Final presentation and R/python code to be submitted before the final presentation day.
3. All the participants must attend review meetings.