🧠 **Presentation Script – Retail Sales Forecasting**
🎤 **By: Manas R. Das | June 2025 | Under the supervision of Mr. Sambit Subhasish Sahu**

🟢 **Slide 1: Title**
Script:
Good [morning/afternoon], everyone.
I'm Manas R. Das, and today, I'll be presenting my machine learning project titled **"Retail Sales Forecasting"**.
This project is an advanced, interactive dashboard solution designed for sales analysis and prediction, developed using **Python and Streamlit**.

🔵 **Slide 2: Objective**
Script:
The objective of this project is to address key challenges in retail analytics using an interactive ML-powered dashboard.
Our goals include:

- Visualizing historical sales using dynamic graphs,
- Tracking KPIs for performance monitoring,
- Forecasting future weekly sales using XGBoost,
- Explaining predictions using SHAP for transparency,
- Allowing custom filters by Store, Department, Season, etc.,
- Enabling easy retraining with new data,
- And finally, presenting everything through a user-friendly Streamlit interface.

🟣 **Slide 3: Technical Specification**
Script:
We've used a rich ecosystem of tools and libraries:

- **Python** and **Streamlit** for development,
- **Pandas**, **NumPy**, **Matplotlib**, and **Plotly** for data processing and visualization,
- **scikit-learn** and **XGBoost** for model building,
- **SHAP** for interpretability,
- And **Joblib** for model persistence.
  These technologies work in sync to deliver a fast, responsive, and insightful dashboard.

🟠 **Slide 4: Project Architecture**
Script:
The dashboard follows a modular multi-page Streamlit architecture:

- The **Dashboard Page** allows filtering and visual analysis,
- The **Forecasting Page** shows model performance and enables sales predictions,
- The **Retrain Page** lets users upload new datasets and update the model.
  This modularity enhances scalability and maintenance.

🟡 **Slide 5: Output**
Script:
The output of the project includes:

- Interactive dashboards with line, bar, pie, and box plots,
- KPIs like Total Sales, Weekly Avg., Unique Stores and Depts.,
- A future forecast plot for user-selected store & department,
- Detailed downloadable sales tables,
- And a retraining status update when new data is uploaded.

🟤 **Slide 6: Outcome**
Script:
The impact of this project includes:

- Better business intelligence via visual analytics,
- Higher accuracy in forecasting,
- Efficient inventory planning,

- Strategic planning support,
- And continuous learning through on-demand retraining.
  Ultimately, it empowers decision-making with data.

🔴 **Slide 7: Real-Life Problems**

Script:

Let's briefly look at the real-world problems we are solving:

- **Sales Volatility** due to promotions, holidays, or external factors,
- **Inventory mismatch** due to guesswork-based planning,
- **Inefficient resource allocation** due to lack of foresight,
- **Lack of data-driven decisions**, and
- **Model obsolescence** as market trends evolve.

🟩 **Slide 8: Solutions**

Script:

Here's how our system addresses them:

- XGBoost reduces sales volatility by considering many influencing factors,
- Accurate forecasts prevent over- and under-stocking,
- Future demand predictions guide staffing and logistics,
- KPIs and SHAP enable explainable and data-driven decisions,
- And the retraining module keeps the model up-to-date.

🟦 **Slide 9: Model Performance + Forecasting**

Script:

The model performance is evaluated using:

- **R-squared**, **MAE**, and **RMSE**.
- SHAP explains which features—like markdowns, holidays, temperature—are impacting predictions.
- Users can interactively forecast weekly sales for any store-department combo.

🟧 **Slide 10: Future Scope**

Script:

This project opens up many possibilities:

- Integrating **Prophet, LSTM**, or ensemble models,
- API integration for real-time data (e.g., weather, social sentiment),
- User authentication and access control,
- Migration from CSV to databases,
- What-if analysis tools,
- Confidence intervals for forecasts,
- Automated retraining via CI/CD,
- Granular markdown and holiday logic,
- Outlier detection, customizable dashboards, and
- Scalability for large-scale retail datasets.

🟫 **Slide 11: Conclusion**

Script:

In conclusion, this project demonstrates how machine learning and modern data visualization can transform retail operations.
It enables proactive planning, enhances forecasting accuracy, and ensures adaptability with retraining.
It's not just a dashboard—it's a decision-making engine.

⚫ **Slide 12: Thank You**

Script:

Thank you for your attention.
I'm open to questions and suggestions.
You can reach me at **dasmanasranjan2005@gmail.com**.