**Problem 1**

I worked with Rohan Ponramesh, who shared his repository. I accessed the data and ran the model.

**Problem 2**

**a. What is a demand planner?***.*

The demand planner is responsible for forecasting the demand of a specific product or service.

**b. Why would a demand planner need product forecasts?**  
Demand planners need forecasts to ensure supply meets demand, optimizing inventory levels and minimizing stockouts.

**c. Based on searching, what is the time frequency most likely needed for these forecasts?**

For fast-moving consumer goods (FMCG) or seasonal items, **weekly** or even **daily** updates might be needed. For industrial goods, **monthly or quarterly** forecasts may suffice.

**d. What data do you need to get started?**

* Historical sales data
* Product attributes (e.g., category, price, marketing spend).
* External factors that influence demand (e.g., employment rates, seasonality, promotions, competitor activities, events, weather).

**e. You are to meet with a couple of the demand planners. What are some questions you would like to ask them?**

* What factors do you believe most impact demand fluctuations?
* What are the most common challenges in the current forecasting process?
* How often do you need forecast updates, and how far ahead do you plan?
* What level of granularity do you need (e.g., per product, per region, per store)?
* How is forecast accuracy measured internally?
* Do you currently use any forecasting software or tools?

**f. After building the models, how would you show to the demand planners that the results should be trusted?**

* Performance metrics: Show MAPE (Mean Absolute Percentage Error), RMSE (Root Mean Square Error), and R² (coefficient of determination).
* Holdout validation: Test the model on unseen data.
* Feature importance analysis.
* Comparison with baseline models.
* Visualization: Present predicted vs. actual demand in a dashboard.

**g. Describe some characteristics of the data that would be needed to productionize the models.**

* Availability: Data should be accessible at the time of forecasting.
* Consistency: The format should remain stable over time.
* Automation: A pipeline should ensure real-time or scheduled updates.
* Data quality: Handle missing values and inconsistencies in advance.

**h. What is your best guess as to how they would want to receive the model results?**

* Preferred format: Excel, CSV, or an interactive dashboard (Power BI, Tableau, Looker, etc.).
* Custom reports: Allow filtering by product, region, or time period.
* Alerting system: If a major shift is predicted, they might want notifications (e.g., email alerts).

**i. What sources did you use to find these answers?**

* For item c.:

<https://www.linkedin.com/pulse/demand-forecasting-predicting-customer-accurately-optimize-76wie/>

* ChatGPT was used to improve answers clarity