

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 R^2 (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