

7-Days Passenger Forecasting (May 28,2025 – June 03,2025)

Date	Local Route	Light Rail	Peak Service	Rapid Route	School
2025-05-28	13984	9509	283	16664	3943
2025-05-29	13984	9509	283	16664	3943
2025-05-30	13984	9509	283	16664	3943
2025-05-31	3484	5169	0	7577	0
2025-06-01	3484	5169	0	7577	0
2025-06-02	13984	9509	283	16664	3943
2025-06-03	13984	9509	283	16664	3943

Algorithm:

The algorithm processes historical passenger data to predict future demand by averaging recent observations, adjusted for weekday and weekend differences.

Steps:

- 1. Preprocessing:** Load the dataset, convert dates to datetime, filter anomalies (Local Route < 100), and flag weekdays (Monday-Friday) versus weekends(Saturday-Sunday).
- 2. Moving Average Calculations:** Compute separate 7-day moving averages for weekdays and weekends using the last 60 days of data for each service type.
- 3. Forecasting:** Assign the appropriate average(Weekday or weekend) to each forecast day, setting Peak Service and School to zero on weekends, reflecting observed patterns.
- 4. Output:** Generate a 7-day forecast table and visualize historical (last 30 days) and forecasted data.

The moving average smooths daily fluctuations, while the weekday/weekend split accounts for significant demand drops on weekends(eg. Local Route: 16,500 weekdays vs 3,500 weekends).

Mode Parameters:

- **Window Size(window = 7):** The no of days used to compute the moving average. A 7-day window aligns with weekly cycles, balancing smoothness and responsiveness to recent trends.

- **Recent Data Period:** The lookback period for selecting recent data. Sixty days ensures sufficient samples (including multiple weeks) while focusing on current patterns, avoiding distortion from older data(e.g., COVID-affected periods).
- **Anomaly Threshold:** Filters out erroneous low values(e.g., Sept 25-29,2024), ensuring reliable averages. This threshold is specific to Local Route, as it consistently has high counts.