ML Take-Home Assignment: Demand Sensing Problem

A store planning team has asked for a reliable **daily 1-month-out** demand forecast to better prepare their workforce. They are asking you to forecast the daily number of items sold ('sales' field) over all stores and products. You are in **September 2019** and you need to forecast the sales for the whole month of **October 2019**.

What you need to do:

- Explore and analyze the sales data.
- Train a **basic and simple ML model** that forecasts the sales for the requested month.
- Validate your model properly with historical data.
- Design and implement an efficient API that uses the trained model and returns the forecast for a given day. Example: api/predict?date=22102019 should return the forecasted sales for 22/10/2019.

Deliverables:

1. The codebase for your analysis and API.
2. A brief README file explaining the structure of your codebase.
3. A short presentation, containing two parts:
    A. General
        i. The problem and solution overview
        ii. An explanation of your model evaluation method
        iii. Your main findings
        iv. A comparison between your model's performance and a "baseline" model, using a few appropriate performance metrics
    B. Technical
        i. A one-page schematic/architectural view of your API and analysis, showing how the components are connected and related.
        ii. [optional] An analysis of how well your API will work under heavy demand, e.g. 100 requests per second and what can be done to improve its resilience.

Notes:

- The focus of this assignment is not perfecting the ML model. The main ask is a robust API design and implementation.
- Make sure that you follow good software engineering standards, your code is well commented, styled, and readable.