Project: Pricing Optimization and Analysis for Retail Products

Description: Instead of focusing solely on sales forecasting, this project aims to optimize pricing strategies for retail products using the M5 Kaggle dataset. By analyzing historical sales data, product attributes, and pricing information, you can identify optimal pricing points for different products and explore the impact of pricing on sales performance. The project will involve data analysis, price elasticity modeling, and visualization to gain insights and develop pricing strategies.

Dataset Source: (feel free to use other datasets)
The M5 Kaggle Dataset can be found on the Kaggle competition page:
`https://www.kaggle.com/c/m5-forecasting-accuracy/data`

Data Exploration and Preprocessing:

- Explore the M5 dataset and understand the provided variables, including product attributes, sales data, and pricing information.
- Perform data cleaning, handle missing values, outliers, and perform necessary preprocessing tasks.

Data Visualization and Analysis:

- Visualize the relationship between prices and sales volumes for different products and product categories.
- Analyze the impact of pricing on sales performance, considering factors such as price fluctuations, promotions, and discounts.
- Formulate interesting questions for analysis, such as:
  - How does price affect sales volumes and revenue?
  - Are there price points that maximize profitability for specific product categories?
  - What is the price elasticity of demand for different products?

Feature Engineering:

- Create additional features that capture relevant information for pricing analysis, such as price change indicators, price levels relative to competitors, or product-specific variables.

Price Elasticity Modeling:

- Develop a price elasticity model to estimate the responsiveness of demand to price changes for different products.
- Use statistical techniques such as regression analysis to estimate price elasticities and identify price sensitivity.

Pricing Optimization:

- Utilize the price elasticity model to optimize pricing strategies for different products.
- Identify optimal price points that maximize sales, revenue, or profitability based on the estimated price elasticities.

Visualization and Interpretation:

- Visualize the optimized pricing strategies and their expected impact on sales and profitability.
- Communicate insights and recommendations through informative visualizations and clear interpretations.

Project Documentation and Presentation:

- Document the project, including the problem statement, methodology, and results.
- Deliver a web application for optimising price.
- Summarize the key findings, pricing strategies, and their potential impact on sales performance.
- Create a compelling presentation to showcase the project's outcomes, challenges, and recommendations.

Ensure that you adapt the timeline based on your specific project requirements and available resources. This project will provide you with valuable experience in pricing optimization and analysis using real-world retail data. Good luck!