Price Optimization Tool - Hiring Assessment

About Client:

A leading global enterprise seeks to improve and optimize its pricing strategy through the development of a Price Optimization Tool. This will allow users to input product data, analyze pricing trends, and optimal pricing recommendations.

Problem Statement:

In the digital era, efficient pricing is crucial for businesses to stay competitive. The client requires a web application that enables business users to determine optimal pricing strategies based on demand forecasts, and market conditions. The goal is to create a multi-functional interface that addresses these needs effectively. The application should integrate several functionalities while maintaining ease of use and performance efficiency.

Specific challenges include:

- **Dynamic User Roles and Permissions:** Implementing a flexible and scalable user authentication and authorization system that can dynamically assign roles and permissions based on changing business requirements.
- **Product management:** Ensure the accurate and secure management of product data including implementing robust search and filter capabilities, while adhering to data privacy regulations.
- **Demand Forecast Integration:** Create a module using user can analyze the demand for several products. They can see the demand trajectory for that product as part of visualization.
- **Pricing Optimization:** This determines the best product prices based on a set of inputs.

Functional Requirements:

The application should cover the following aspects:

PART A: Product Management

Product Management:

- Create and Manage Product:

    - Ability to create, view, update, and delete products.
    - Products should include details such as name, category, cost price, selling price, description, stock available and units sold till date.

- Search and Filter Products:
    - Implement advanced search functionality to find products based on multiple criteria (name).
    - Add filters to sort products by attributes like category.

PART B: Demand Forecast and Pricing Optimization

Demand Forecast Integration:

- The user should be able to show demand forecast for the product.
- Users should be able to see the forecasted demand of different products on a linear plot (demand vs selling price) based on the output

Pricing Optimization:

- The data should be shown in a tabular form having the product details along with optimized prices.

Technical Requirements:

1. User Authentication and Authorization:
   - Implement user registration and login functionality with email verification.
   - Role-based access control with different permissions for admin, buyer, and supplier roles, and support for custom roles.
2. Backend Framework:
   - Use Python (Django/Flask/FastAPI) for backend development, with a focus on scalability and security.
3. Frontend Framework:
   - Use modern JavaScript frameworks such as React.js or Angular for the frontend, with a responsive and intuitive design.
4. Database Services:
   - Utilize a relational database (e.g., PostgreSQL, MySQL) and follow normalization principles.
   - Implement database indexing for improved search performance.
5. Code Quality:
   - Ensure the code is structured, scalable, and well-commented.
   - Provide proper installation steps and an updated README.md file.
6. UI/UX:

- The user interface should be client-presentable, intuitive, and responsive.
- Utilize charting libraries (e.g., Chart.js, D3.js) for data visualization.

Data Attributes for Supplier Profiles and Purchase Orders:

Product Attributes:

- Product ID
- Name
- Description
- Cost Price
- Selling Price
- Category
- Stock Available
- Units Sold
- Customer Rating
- Demand Forecast
- Optimized Price

Submission Instructions:

1. Complete the test using your laptop.
2. Take screenshots of the UI and save them in a PPT or PDF format.
3. Share the code base along with the screenshots.
4. Submit your assignment as per the provided instructions.
5. **Include a README.md file with proper instructions to set up the project, an overview of the functionality, and a summary of what was your understanding of the assignment during the development process.**

Points to Remember:

- Timeliness: Adhere to the given timelines. The test is designed to be completed within 2 days.
- Documentation: Provide clear and concise documentation in the README.md file. This should include setup instructions, an explanation of the project's features, and key learnings from the exercise.