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Build for Bharat

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Team Name: Algoaces

Team Leader Name: Ann Mariya Francis

Team Member Names: Mohit Mande, Sesna Tomy

Problem Statement Category: Scalable Solution

Problem Statement: Prize Optimization Engine

Architecture & Design for the innovative solution.

1. Modular architecture

Retail price optimization can be tackled as a regression problem, where the objective is to predict the optimal price for a given product, based on various factors such as product features, competitor prices, and customer behavior.

Regression is a statistical technique used to analyze the relationship between two or more variables. Here we use **RandomForestRegressor**, a popular regression technique based on the Bagging method of Ensemble learning, Random Forest.

Architecture & Design for the innovative solution.

2. Tech evaluation

- **Extensibility:** We assess the ability of our solution to accommodate new pricing strategies or product categories. The modular architecture allows for easy integration of additional features and functionalities without significant modifications. We leverage APIs and flexible configuration options to extend the solution's capabilities and adapt to changing business requirements.
- **Scalability:** Our solution is designed to handle large volumes of pricing data and user requests efficiently. We analyze scalability in terms of both horizontal and vertical scaling to ensure optimal performance under increasing workload.

Define customization & deployment options of your proposed solution.

Customization Options:

Customize the preprocessing function predict() to handle newly added features and ensure seamless integration with the existing model.

The user interface of the Streamlit app includes interactive visualizations and advanced analytics dashboards.

Deployment Option:

Developed a webapp that was hosted in Streamlit

Test cases & data (as applicable) against which the eval criteria can be assessed

Prediction Accuracy:

The accuracy of our model is 94.77%

Use a test dataset with known outcomes to assess the model's predictive performance.

Model Robustness:

Our model is robust across different product categories, customer segments, and market conditions. It generalizes well to new data and unseen scenarios.

Performance Testing:

We Assessed the performance of our system under various load conditions, including peak usage periods.

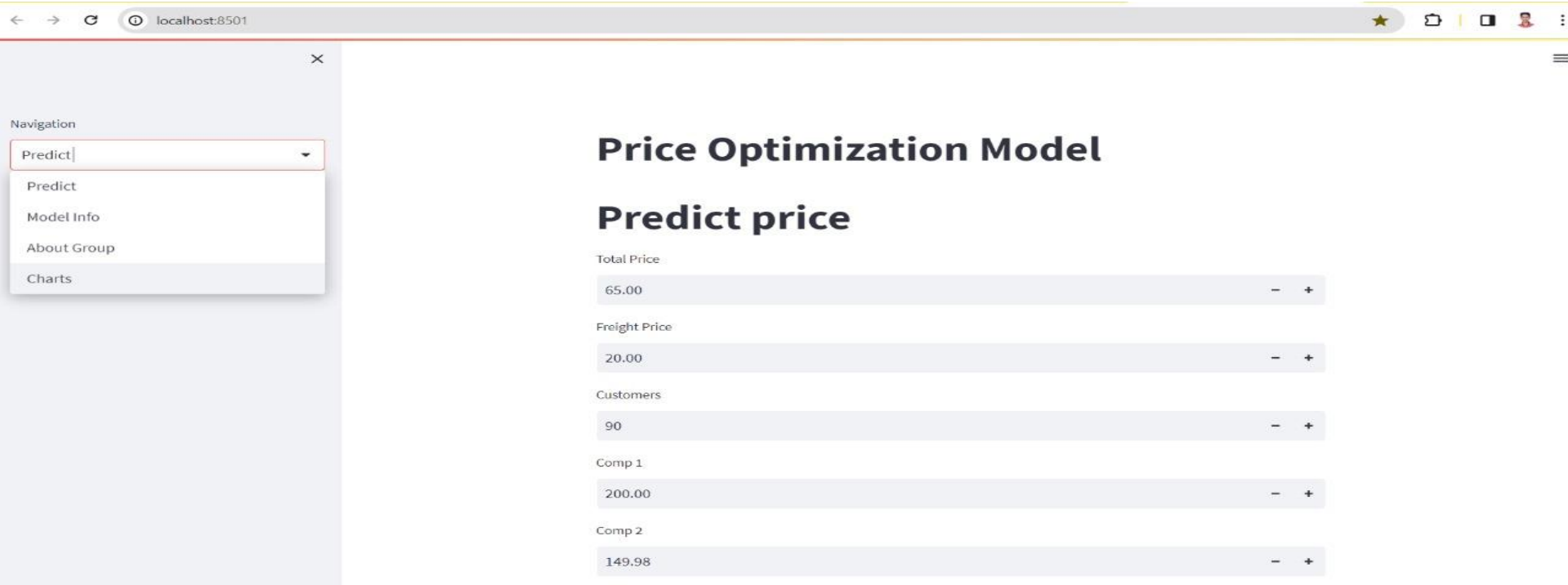
We measured response times for price predictions and system scalability.

Integration Testing:

We tested the integration of different system components, such as predictive models, and user interfaces.

We Verified that data flows smoothly between components and the outputs are consistent across the system.

Demonstrate working of the solution to the evaluation team



Navigation

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Price Optimization Model

Predict price

Total Price	65.00	-	+
Freight Price	20.00	-	+
Customers	90	-	+
Comp 1	200.00	-	+
Comp 2	149.98	-	+

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Demonstrate working of the solution to the evaluation team

Navigation

Charts

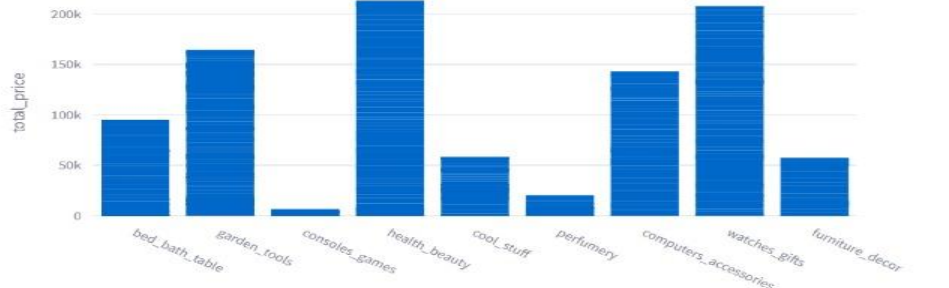
Price Optimization Model

Charts

Select Chart Type

Chart 1

Total Price by Product Category



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Important Links:-

- [GitHub Public Repository Link](#)
- [Link to test cases and data files](#) – ran the solution locally within our system
- [Video Link](#)



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