

Machine Learning Approach of Price Prediction

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Abstract -This paper presents a Laptop price prediction system by using the supervised machine learning technique. The research uses multiple linear regression as the machine learning prediction method which offered 81% prediction precision. Using multiple linear regression, there are multiple independent variables but one and only one dependent variable whose actual and predicted values are compared to find precision of results. This paper proposes a system where price is dependent variable which is predicted, and this price is derived from factors like Laptop's model, RAM, ROM (HDD /SSD), GPU, CPU, IPS Display, and Touch Screen. Price prediction is a useful feature for consumers as well as businesses. A price prediction tool motivates users to engage with a brand or evaluate offers in order to spend their money wisely. Price prediction enables businesses to set pricing in a manner that builds customer engagement and loyalty. With Machine Learning (ML) technology a price prediction problem is formulated as a regression analysis which is a statistical technique used to estimate the relationship between a dependent/target variable and single or multiple independent (interdependent) variables. In regression, the target variable is numeric. This project will focus on ML algorithm used for price prediction.

Keywords: Multiple Linear regression, Laptop Price, Regression model, Machine Learning.

1. INTRODUCTION

Laptop price prediction especially when the laptop is coming direct from the factory to Electronic Market/Stores, is both a critical and important task. The mad rush that we saw in 2020 for laptops to support remote work and learning is no longer there. In India, demand of Laptops soared after the Nationwide lockdown, leading to 4.1-Million-unit shipments in the June quarter of 2021, the highest in the five years. Accurate Laptop price prediction involves expert knowledge, because price usually depends on many distinctive features and factors. Typically, most significant ones are brand and model, RAM, ROM, GPU, CPU, etc. In this paper, we applied different methods and techniques in order to achieve higher

precision of the used laptop price prediction. With the rapid development of the Internet and the rise of e-commerce, more and more data are generated on e-commerce websites. In the face of such huge data, reasonable utilization will produce great value. For example, the development trend of Tmall platform can be estimated through the full amount of commodities calculated on Tmall platform. For the commodities of a certain industry and company, by calculating its GMV (Gross Merchandise Volume) at a specific time, and then doing year-on-year and sequential analysis, the development trend of the industry and company can be analyzed, which can be used as important references for Chinese concept stocks.

2. PURPOSE

In the field of finance and stock market trading, the purpose of using a machine learning approach for price prediction is to develop a model that can provide accurate and reliable predictions of future prices of financial assets. The use of machine learning algorithms and statistical models can analyse vast amounts of historical market data and identify patterns and trends that can be used to make informed predictions about the future performance of a particular asset. The primary goal of using machine learning for price prediction is to provide traders, investors, and financial analysts with actionable insights that can inform their decision-making. These insights can help to optimize trading strategies, reduce risk, and increase profitability. Additionally, machine learning models can adapt to changing market conditions and provide up-to-date predictions in real-time.

3. PROJECT SCOPE

The scope for using machine learning for price prediction is vast and constantly expanding. With the increasing availability of market data and the growing complexity of financial markets, machine learning models offer a powerful tool for predicting future price movements of various financial assets. One of the key advantages of using machine learning for price prediction is its ability to handle large and complex data sets. Machine learning models can process vast amounts of historical data, such as price, volume, and market

indicators, to identify patterns and trends that may be difficult for humans to discern. This enables traders, investors, and financial analysts to make more informed decisions based on the insights provided by the model.

4. PROJECT GOALS AND OBJECTIVES

The goal of using machine learning for price prediction is to develop an accurate and reliable model that can predict future prices of financial assets. The objectives of this goal include analysing historical market data, incorporating market indicators and news events, evaluating model performance, and providing real-time predictions. Achieving these objectives can provide traders, investors, and financial analysts with valuable insights for informed decision-making in the financial markets.

The goals for predicting the price can depend on various basis. Here we have given some of the basics goals to be achieved through our project.

- Develop an accurate and reliable machine learning model for predicting future prices of financial assets.
- Analyse vast amounts of historical market data to identify patterns and trends that can be used to inform the model.
- Incorporate various market indicators and news events that may affect the price of a particular asset into the model.
- Evaluate the performance of the model using metrics such as mean absolute error, mean squared error, or root mean squared error.
- Optimize the model for improved performance by adjusting hyper-parameters and feature selection.
- Test the model on out-of-sample data to validate its predictive capabilities and assess its generalizability.
- Provide actionable insights to traders, investors, and financial analysts for informed decisionmaking in the financial markets.

The main objective of the project is to develop an accurate and reliable machine learning model for predicting future prices of financial assets. To achieve this objective, the project will involve collecting and preprocessing vast amounts of historical market data, including price and volume data, market indicators, and news events. This data will be used to identify patterns and trends that can be used to inform the machine learning model.

5. SYSTEM FEATURES

Some common system features found in DSD software: These functional requirements are crucial to the success of the Machine Learning Approach of Price Predictor project, as they define the core functionalities of the system and the tasks that it must perform to achieve its goals.

1. **Data Collection:** The system must collect relevant data from reliable sources, including historical price data, economic indicators, news articles, and social media sentiment.
2. **Data Preprocessing:** The system must preprocess the collected data to remove noise, outliers, and missing values. This includes data cleaning, normalization, feature selection, and dimensionality reduction.
3. **Model Selection:** The system must select appropriate machine learning models, including regression, decision trees, neural networks, and ensemble methods, based on the characteristics of the data and the prediction task.
4. **Model Training:** The system must train the selected models using the preprocessed data and appropriate machine learning algorithms, including gradient descent, random forest, and deep learning.
5. **Model Evaluation:** The system must evaluate the trained models using appropriate metrics, including mean squared error, R-squared, and accuracy, to ensure their performance meets the desired criteria.
6. **Prediction Generation:** The system must generate accurate and timely predictions of future prices based on the trained models and the latest available data.
7. **Visualization:** The system must present the predictions and relevant data in an intuitive

6. SYSTEM ARCHITECTURE DESIGN

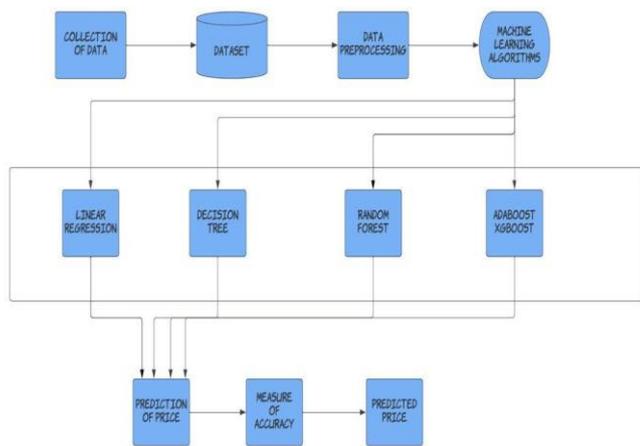


Fig – 1: System Architecture

7. SUB-SYSTEM DEVELOPMENT

The first module involves data preprocessing, which is essential to ensure the quality of the data that will be used for price prediction. This module typically includes the following steps:

1. Data Collection: In this step, the relevant data is collected from various sources and compiled into a single dataset.
2. Data Cleaning: Here, the collected data is cleaned by removing any missing or irrelevant data, ensuring consistency across the dataset.
3. Data Transformation: The data is transformed into a format that can be used by the machine learning algorithms. This may involve scaling, normalization, or other types of data manipulation.
4. Data Splitting: The dataset is split into training and testing sets to evaluate the performance of the machine learning models.

The second module involves the development of the machine learning model that will be used for price prediction. This module typically includes the following steps:

1. Model Selection: In this step, the appropriate machine learning algorithm is selected based on the characteristics of the dataset and the specific problem being addressed.
2. Feature Selection: Here, the most relevant features are selected from the dataset to improve the performance of the machine learning algorithm.
3. Model Training: The selected model is trained on the training data to learn the underlying patterns and relationships in the data.

4. Model Evaluation: The performance of the trained model is evaluated on the testing data to ensure that it is accurate and robust.

8. CLASS DIAGRAM

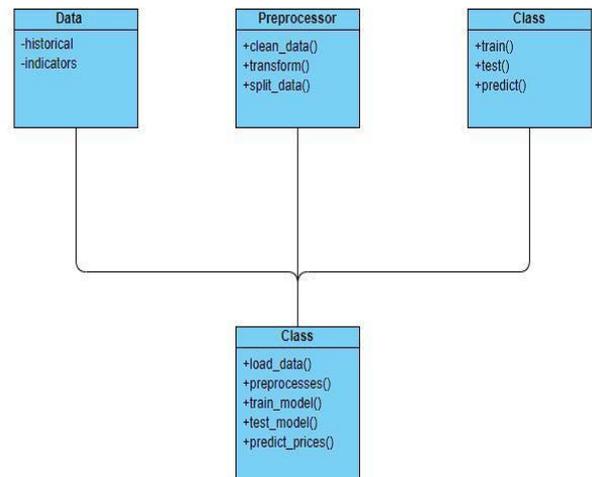
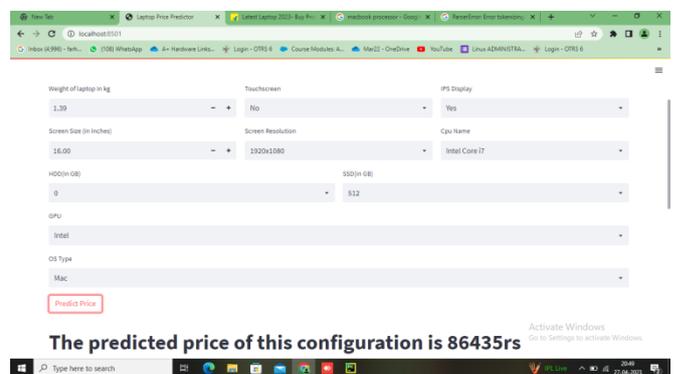
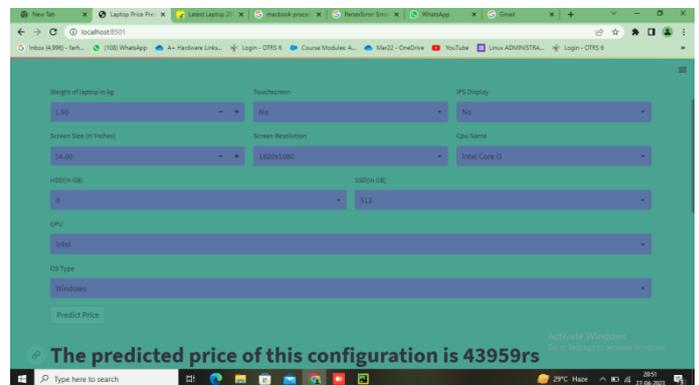
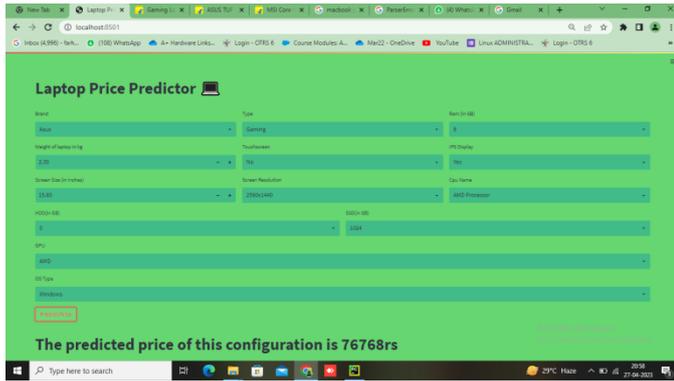


Fig – 2: Class Diagram

9. SCREENSHOTS





10. CONCLUSIONS

In conclusion, the "Machine Learning Approach of Price Predictor" project is a promising application of machine learning techniques in the financial domain. By predicting the prices of financial assets, the system can provide valuable insights to traders, investors, and financial institutions, and help them make informed decisions based on data analysis and prediction models. The project has identified and defined the functional and non-functional requirements of the system, including data collection, preprocessing, model training, prediction generation, reliability, usability, maintainability, portability, and performance. By following a structured project management approach, the team can develop and deliver a high-quality system that meets the user's requirements and expectations.

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