

Data Prediction Model

A MINI PROJECT REPORT

Submitted by

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GUJARAT TECHNOLOGICAL UNIVERSITY



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CERTIFICATE

This is to certify that the project report submitted along with the project entitled **Data prediction Model** has been carried out by **Jill Joshi 201310132059** under my guidance in partial fulfilment for the degree of Bachelor of Engineering in Information and Communication Technology, 8th Semester of Gujarat Technological University, Ahmadabad during the academic year 2023-24.

Dr. Mani shekhar

Dr.Ajay Kumar Vyas

Internal Guide

Introduction

Purpose

The purpose of a data prediction system is to analyse historical data and identify patterns, trends, and relationships within that data in order to make informed predictions about future outcomes or events. Overall, the purpose of a data prediction system is to leverage historical data to gain insights into future events or outcomes, thereby enabling organizations out future data points.

Some common purposes and applications of data prediction systems include:

- **Forecasting:** Predicting future trends, such as sales, stock prices, weather patterns, or demand for products and services.
- **Risk Management:** Identifying potential risks and predicting the likelihood of certain events occurring, such as credit defaults, fraudulent activities, or equipment failures.
- **Optimization:** Optimizing processes and resource allocation based on predicted outcomes, such as inventory management, supply chain optimization, or resource scheduling.
- **Personalization:** Providing personalized recommendations or services based on predicted user behaviour or preferences, such as movie recommendations, targeted advertising, or personalized healthcare recommendations.
- **Decision Support:** Assisting decision-making processes by providing insights and predictions based on data analysis, such as in financial investment decisions, healthcare diagnosis, or marketing strategy planning.
- **Preventive Maintenance:** Predicting equipment failures or maintenance needs based on historical usage and performance data, in order to schedule maintenance activities proactively and minimize downtime.

Overall, the purpose of a data prediction system is to leverage historical data to gain insights into future events or outcomes, thereby enabling organizations to make better-informed decisions and improve efficiency, effectiveness, and competitiveness.

Product Scope

Model offers a comprehensive solution for predicting laptop prices based on key features such as processor speed, RAM size, storage capacity, and weight. Its product scope encompasses various applications and integration possibilities across industries, including:

- Laptop Pricing Tools: Integration into software applications or web-based tools for retailers, manufacturers, or consumers to estimate laptop prices.
- E-commerce Platforms: Real-time price predictions for laptop shoppers to make informed purchasing decisions.
- Retail Analytics Solutions: Analysis of market trends and consumer preferences for optimizing inventory management and pricing strategies.
- Customized Pricing Models: Tailored pricing strategies based on specific market segments and customer preferences.
- Mobile Applications: Integration into mobile apps for price comparison and real-time pricing information.
- API Integration: Exposure as an API for seamless integration into third-party applications and services.
- Consulting and Advisory Services: Providing insights and recommendations to businesses for optimizing pricing strategies and improving competitiveness.

Overall, the model serves as a versatile tool for decision-making, market analysis, and enhancing the customer experience in the laptop retail sector.

Overall Description

Product Perspective

Our model represents a pioneering advancement in the realm of predictive analytics, specifically tailored to the dynamic landscape of laptop pricing. By harnessing cutting-edge machine learning algorithms, it offers unparalleled accuracy and insight into the pricing dynamics of laptops based on a multitude of key features.

At the forefront of data-driven decision-making, our model provides a robust solution for retailers, manufacturers, and consumers alike. By seamlessly integrating into various platforms and applications, it empowers users to make informed choices, optimize pricing strategies, and stay competitive in the ever-evolving laptop market.

Product Functions

Major functions performed by the laptop price prediction model :

Data Analysis: It analyses historical data on laptop prices and features to identify patterns and relationships.

Feature Extraction: The model extracts relevant features from the dataset, including processor speed, RAM size, storage capacity, and weight, which are crucial factors in determining laptop prices.

Model Training: Using machine learning techniques such as linear regression, the model is trained on the extracted features and corresponding price data to learn the underlying relationships between them.

Price Prediction: Once trained, the model can predict the price of a laptop based on its features. This functionality allows retailers, manufacturers, and consumers to estimate the price of a laptop before making purchasing decisions.

Evaluation: The model evaluates its performance using metrics such as mean squared error and R-squared to assess how well it predicts prices compared to actual prices in the dataset.

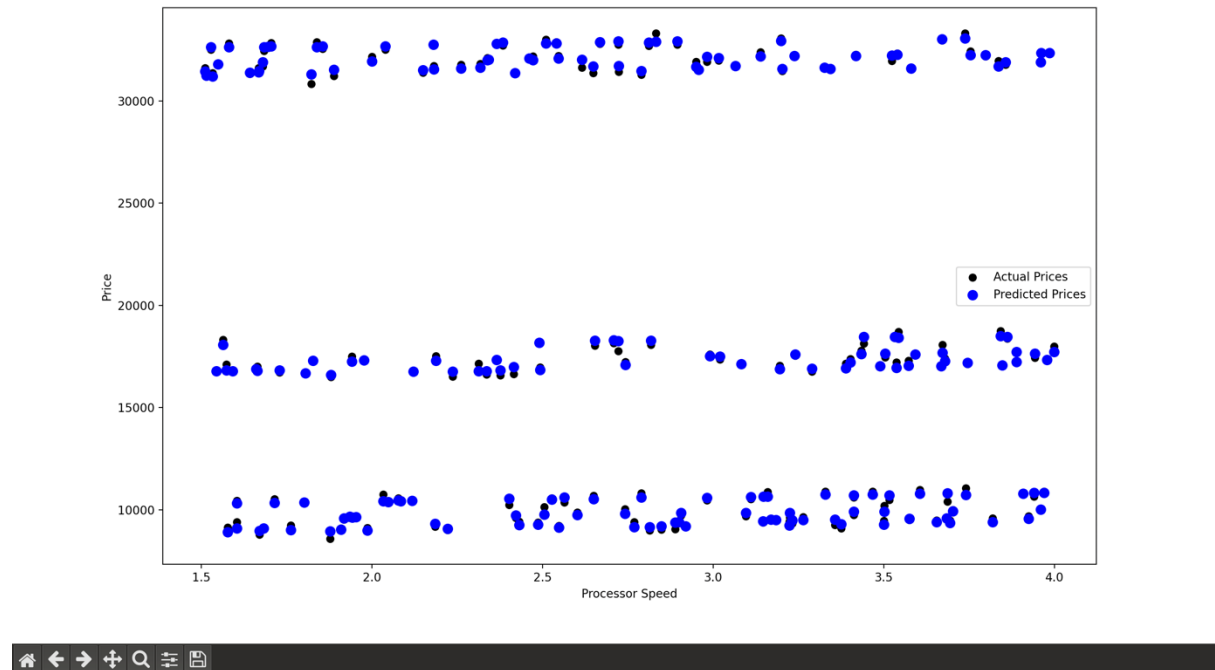
Visualization: It provides visualizations, such as scatter plots, to illustrate the relationship between predicted and actual prices, aiding in understanding the model's performance.

Real-time Prediction: The model allows for real-time prediction of laptop prices, enabling users to obtain price estimates quickly and efficiently.

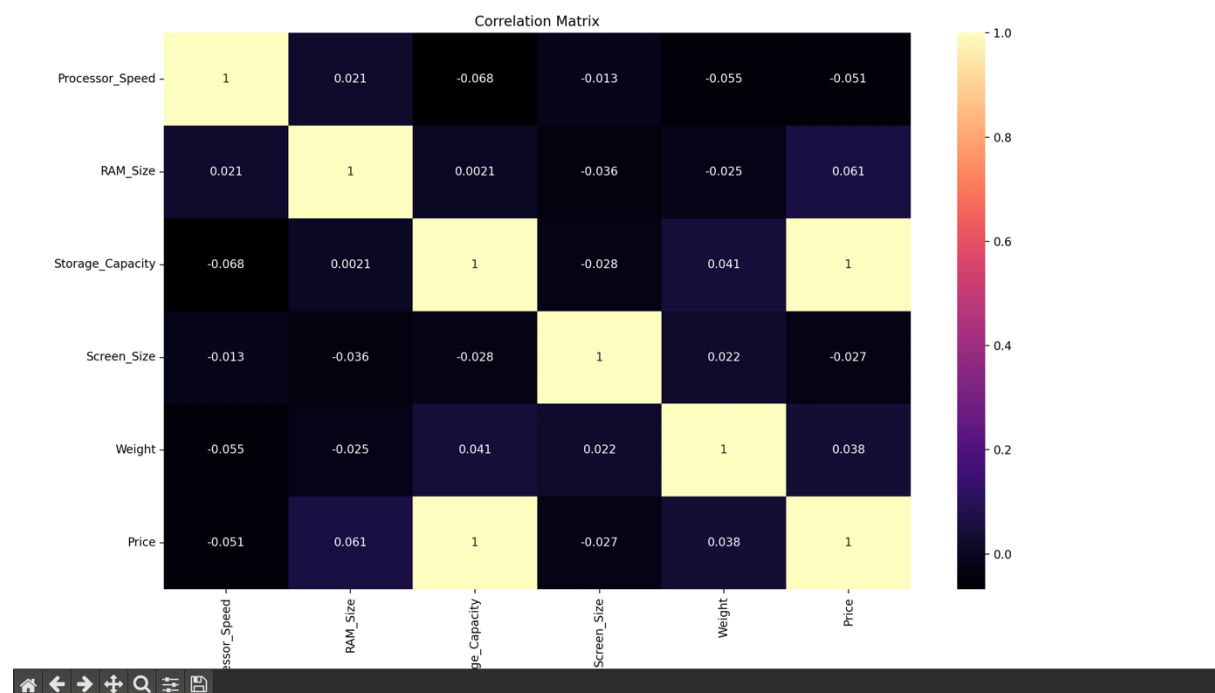
Scalability and Integration: The model is designed to be scalable and can be integrated into various applications and platforms, making it adaptable to different business needs and scenarios.

Graphs

Prediction Scatter Plot



Correlation Matrix



Libraries Used

```
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, r2_score
import matplotlib.pyplot as plt
from sklearn.preprocessing import PolynomialFeatures
import seaborn as sns
```

Accuracy, MSE value, R- square, New laptop price prediction

```
Accuracy 99.96504576784469
Mean Squared Error: 31737.23721260079
R-squared: 0.9996504576784468
Predicted Price for the New Laptop: 9279.916023782509
```

Weekly Task Report

1. 1st week
 - a. Had an introduction to the Devstree data science department and got my assignment.
 - b. Took the task of price prediction based on adidas large dataset.
 - c. Got the understanding of Data cleaning, Model Training and testing
2. 2nd Week
 - a. Completed my first linear regression model for price prediction of adidas dataset.
 - b. Reviewed my model by the guide and did the changes on the model to get better accuracy.
 - c. Started a building a new model on new dataset which is of different laptops.
3. 3rd week
 - a. Learnt to use corelation matrix to get better accuracy.
 - b. Used different graphs to understand the dataset.
 - c. Finally completed my model and the accuracy of the model was 99.96% .
4. 4th week
 - a. After three weeks of doing data prediction my mentor suggested to use natural language processing.
 - b. Learnt about new libraries like sci-kit learn.
5. 5th week
 - a. After exploring the sci-kit learn library, my mentor gave a project. In this project a dataset of different resume was present, I need to build a model which reads all the resume and provides me with the field that resume comes under like data science, PHP, HR etc.
 - b. The whole week was utilised in cleaning the dataset in order to use any further.
6. 6th Week
 - a. Had a progress meeting with the mentors and decided the flow for upcoming days.
 - b. Started Building the web app and completed it.

7. 7th Week

- a. To make the project more useful and accurate, sentiment analysis was suggested.
- b. Learnt about different ready made models like vader.