Shivnagar Vidya Prasarak Mandal's

COLLEGE OF ENGINEERING

Malegaon (Bk.), Tal: Baramati,
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DEPARTMENT OF
COMPUTER ENGINEERING

A PROJECT REPORT ON

DATA SCIENCE

ON

"Product Demand Prediction"

Submitted by

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Under the Guidance of

Prof. Nimbalkar S. S.

[Academic Year 2021-22]

CERTIFICATE

This is to certify that the Internship report entitled

"Product Demand Prediction"

Submitted By

Jamdade Vishwajit Sandip
Kunjir Shubham Ganesh
Salunkhe Hrutika Ravindra

is a bonafide work carried out by them under the supervision of Prof. S. S. Nimbalkar and it is approved for the partial fulfillment of the requirement of Savitribai Phule Pune University for the award of the Degree of Bachelor of Engineering (Computer Engineering)

This Project report has not been earlier submitted to any other Institute or University for the award of any degree or diploma.

Prof. Nimbalkar S. S.   **Prof. Dabhade S.A.**

Internal Guide   Head of Department
Department of Computer   Department of Computer
Engineering   Engineering

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External Reviewer   Principal

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Date:

Place: SVPM's College of Engineering,Malegaon(Bk).

ACKNOWLEDGEMENT

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ABSTRACT

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You must have studied that the demand for a product varies with the change in its price. If you take real-world examples, you will see if the product is not a necessity, then its demand decreases with the increase in its price and the demand increases with the decrease in its price. If you want to know how we can predict demand for a product with machine learning, this article is for you. In this article, I will walk you through the task of product demand prediction with machine learning using Python.

INTRODUCTION

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A product company plans to offer discounts on its product during the upcoming holiday season. The company wants to find the price at which its product can be a better deal compared to its competitors. For this task, the company provided a dataset of past changes in sales based on price changes. You need to train a model that can predict the demand for the product in the market with different price segments.

The dataset that we have for this task contains data about:

1. the product id;
2. store id;
3. total price at which product was sold;
4. base price at which product was sold;
5. Units sold (quantity demanded);

I hope you now understand what kind of problem statements you will get for the product demand prediction task. In the section below, I will walk you through predicting product demand with machine learning using Python.

PROBLEM STATEMENT
_____

      To train a model that can predict demand of the product in the market with different price segments from the given dataset.

SYSTEM ARCHITECTURE
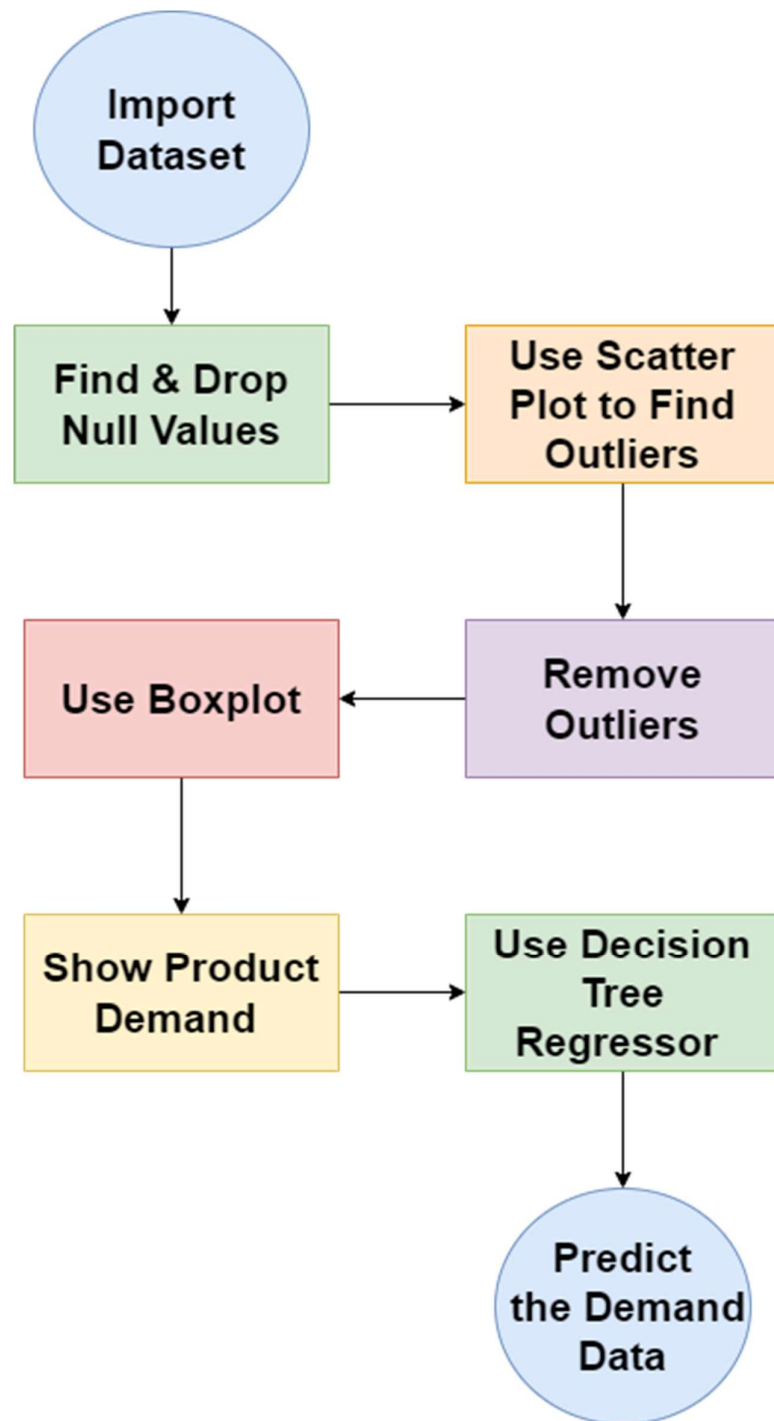
OBJECTIVES

_____

- The Objectives of Product Demand Prediction are:

- Financial planning,

- Pricing policy

- Manufacturing policy

- Sales, and Marketing planning

- Capacity planning and expansion

ALGORITHM

Step 1: Import all the necessary libraries

Step 2: Import dataset

Step 3: Check the dataset values
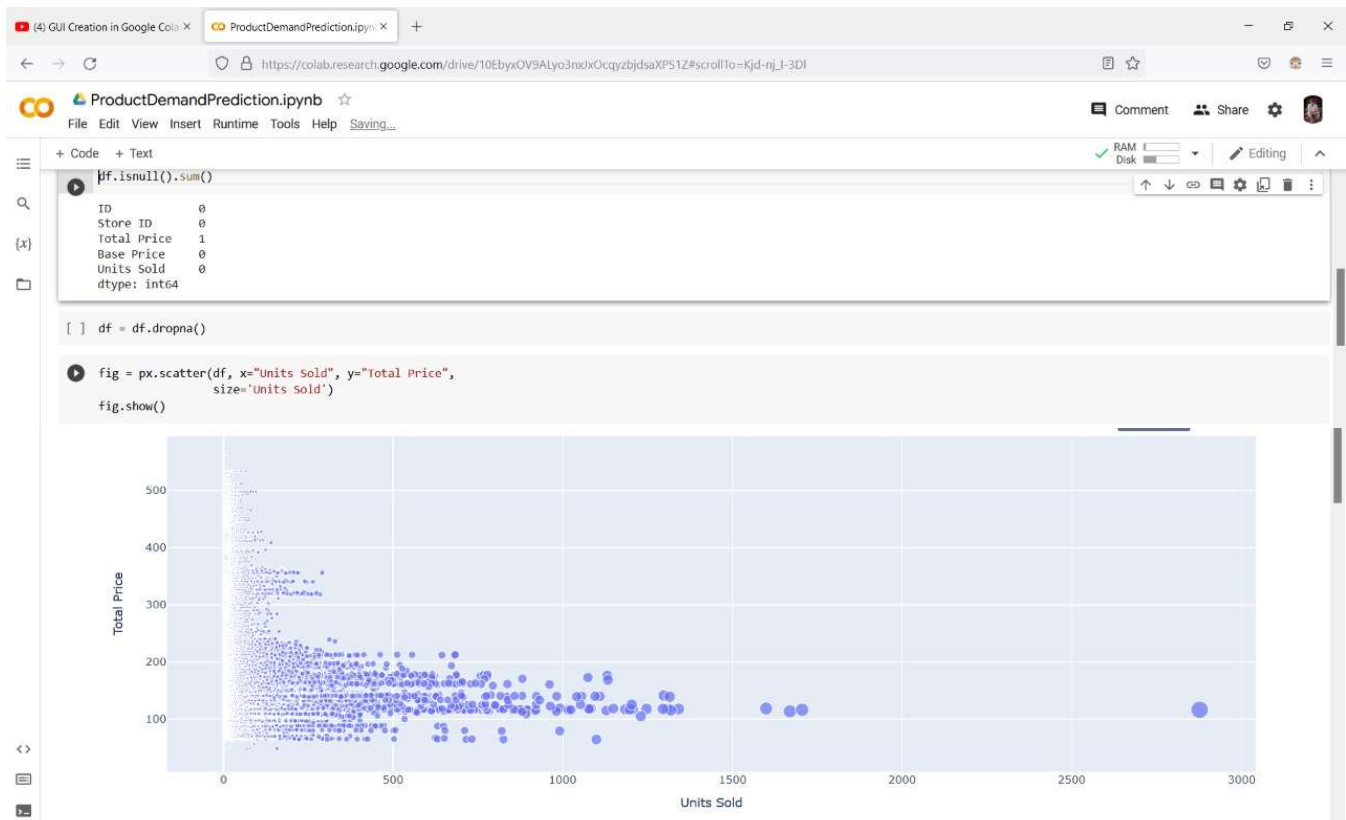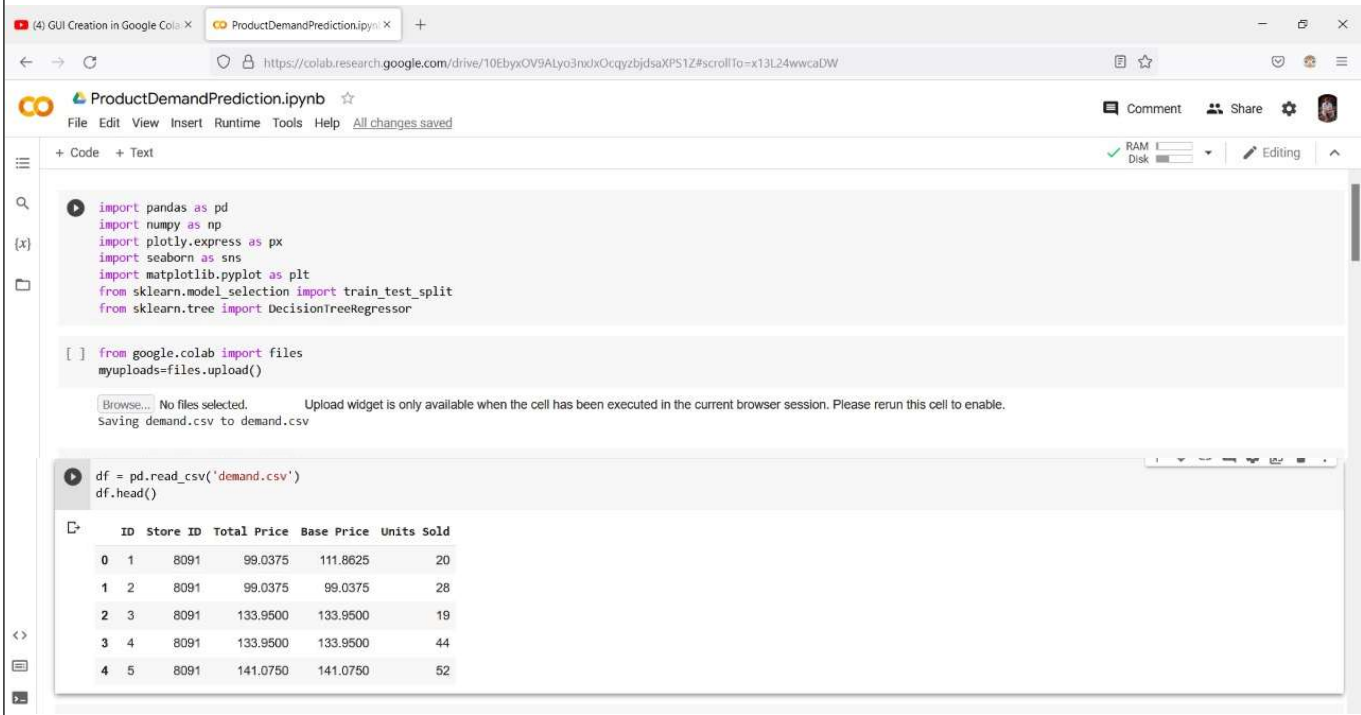
Step 4: Print the null values and drop them

Step 5: Use the scatter plot method to find

the outliers.

Step 6: Then correct the data by removing

outliers

Step 7: Use the box plot method to show the product demand

Step 8: Use Decision Tree Regressor to predict the demand data.

RESULT

_____

ProductDemandPrediction.ipynb ☆
File Edit View Insert Runtime Tools Help All changes saved

Comment   Share ⚙

+ Code   + Text

```
print(df.corr())
```

```
              ID    Store ID  Total Price  Base Price  Units Sold
ID        1.000000  0.007461     0.008473    0.018911   -0.010608
Store ID  0.007461  1.000000    -0.038315   -0.038855   -0.004369
Total Price 0.008473 -0.038315   1.000000    0.958885   -0.235625
Base Price  0.018911 -0.038855    0.958885    1.000000   -0.140022
Units Sold -0.010608 -0.004369   -0.235625   -0.140022    1.000000
```

```python
correlations = df.corr(method='pearson')
plt.figure(figsize=(15, 12))
sns.heatmap(correlations, cmap="coolwarm", annot=True)
plt.show()
```


✓ 0s   completed at 11:14 PM

```python
x = df[["Total Price", "Base Price"]]
y = df["Units Sold"]
```

```python
xtrain, xtest, ytrain, ytest = train_test_split(x, y,
                                                test_size=0.2,
                                                random_state=42)
from sklearn.tree import DecisionTreeRegressor
model = DecisionTreeRegressor()
model.fit(xtrain, ytrain)
```

```
DecisionTreeRegressor()
```

```python
features = [["Total Price", "Base Price"]]
features = np.array([[133.00, 140.00]])
model.predict(features)
```

```
/usr/local/lib/python3.7/dist-packages/sklearn/base.py:451: UserWarning:

X does not have valid feature names, but DecisionTreeRegressor was fitted with feature names

array([27.])
```

❖ GUI For Prediction

Product Demand System

Date: 2022 / 05 / 02 📅

ProductID: 5

UnitSold: Between 100-150

ProductSale: Moderate

Show code

2022-05-02
4
Between 1-50
Good

CONCLUSION

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In above project we have created a model that shows the demand of the product according to the unit sold and helps us to find sales.

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