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

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[Academic Year 2021-22]

CERTIFICATE

This is to certify that the Internship report entitled

"Product Demand Prediction"

Submitted By

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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.

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Jamdade Vishwajit Sandip
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ABSTRACT

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

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:

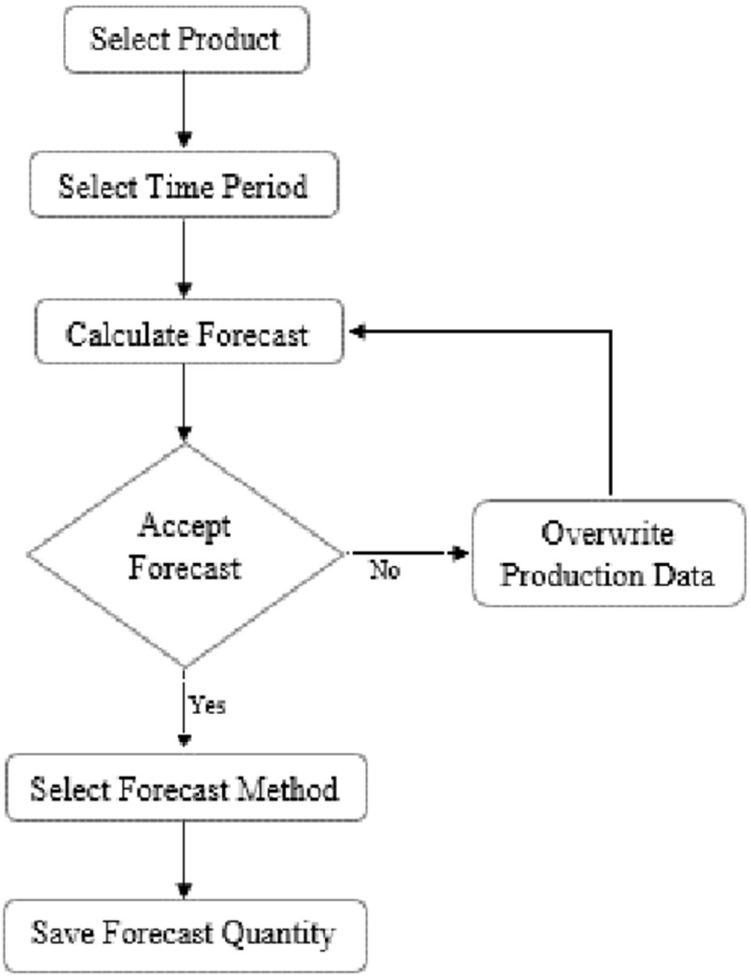
1. the product id;
2. store id;
3. total price at which product was sold;
4. base price at which product was sold;
5. Units sold (quantity demanded);

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: Make it a collaborative effort

Step 2: Identify and agree upon the assumptions

Step 3: Build granular models

Step 4: Use flexible time periods

Step 5: Generate a range of forecasts

Step 6: Deliver the outputs that users need quickly

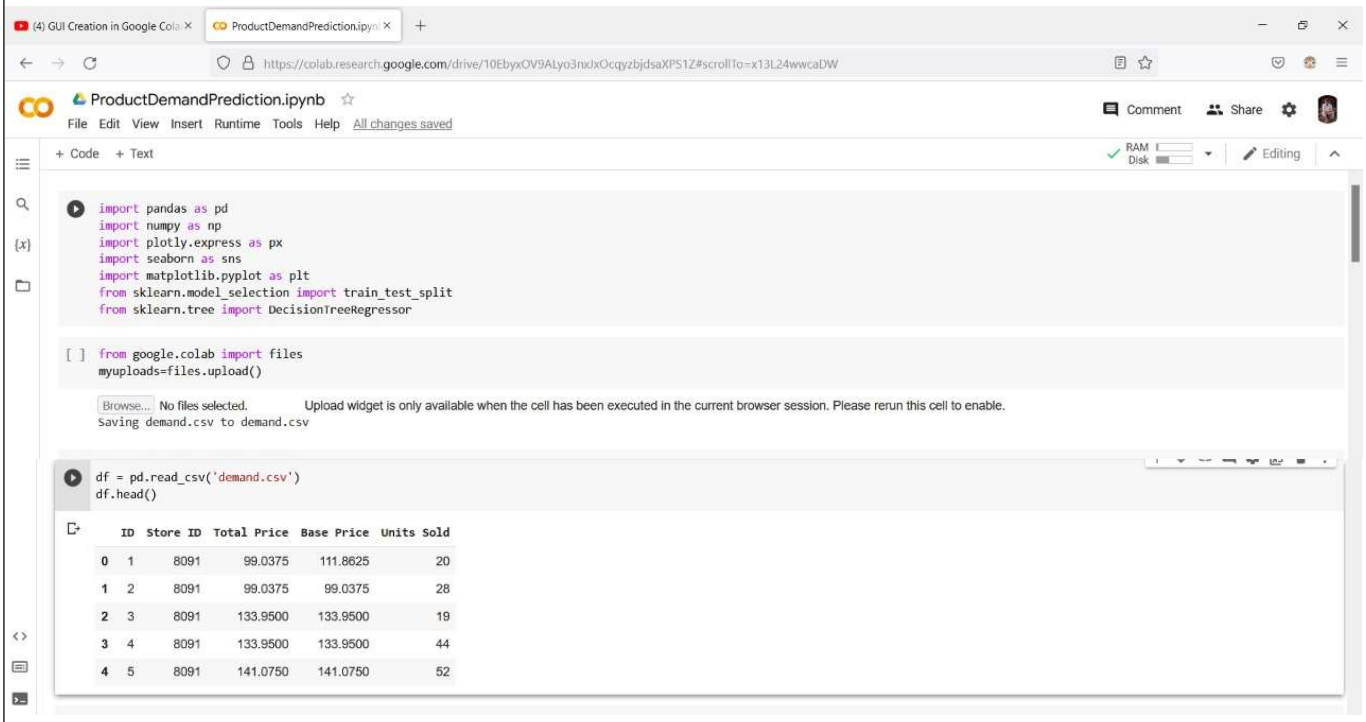
Step 7: Combine different techniques

Step 8: Reality check the forecast

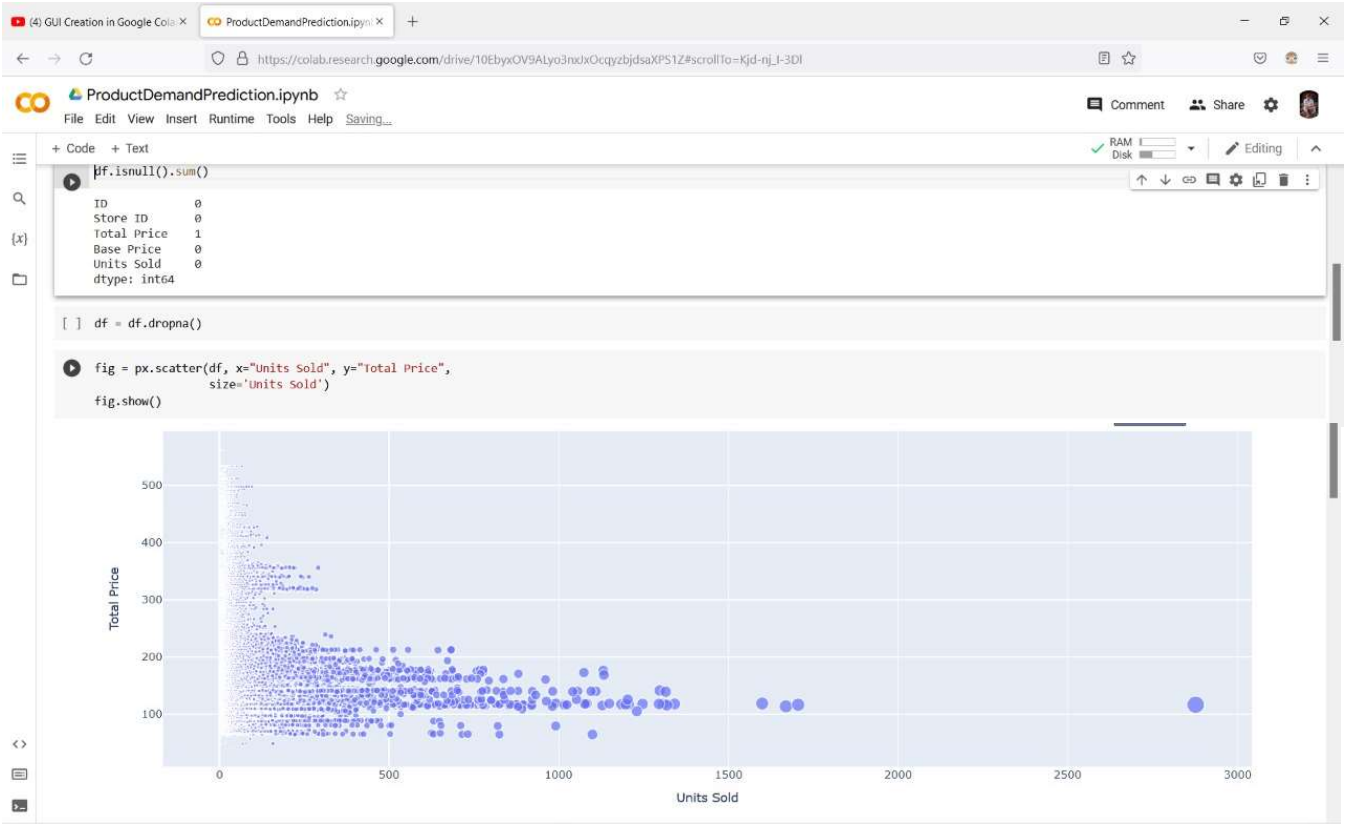
Step 9: Reforecast, reforecast and reforecast some more

Step 10: Be prepared to cut your losses

RESULT



	ID	Store ID	Total Price	Base Price	Units Sold
0	1	8091	99.0375	111.8625	20
1	2	8091	99.0375	99.0375	28
2	3	8091	133.9500	133.9500	19
3	4	8091	133.9500	133.9500	44
4	5	8091	141.0750	141.0750	52



(4) GUI Creation in Google Colab | ProductDemandPrediction.ipynb

https://colab.research.google.com/drive/10EbyxOV9ALyo3nxJxOcqyzbjdsaXPS1Z#scrollTo=Kjd-nj_I-3DI

ProductDemandPrediction.ipynb

File Edit View Insert Runtime Tools Help All changes saved

Comment Share

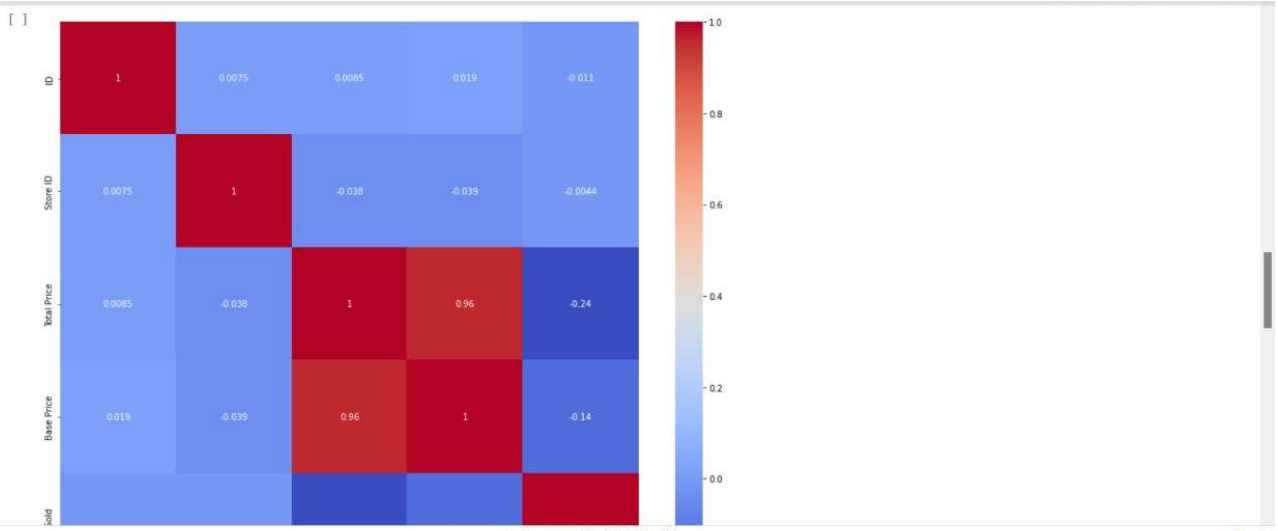
+ Code + Text

RAM Disk Editing

```
[ ] 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
```

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



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

```
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()
```

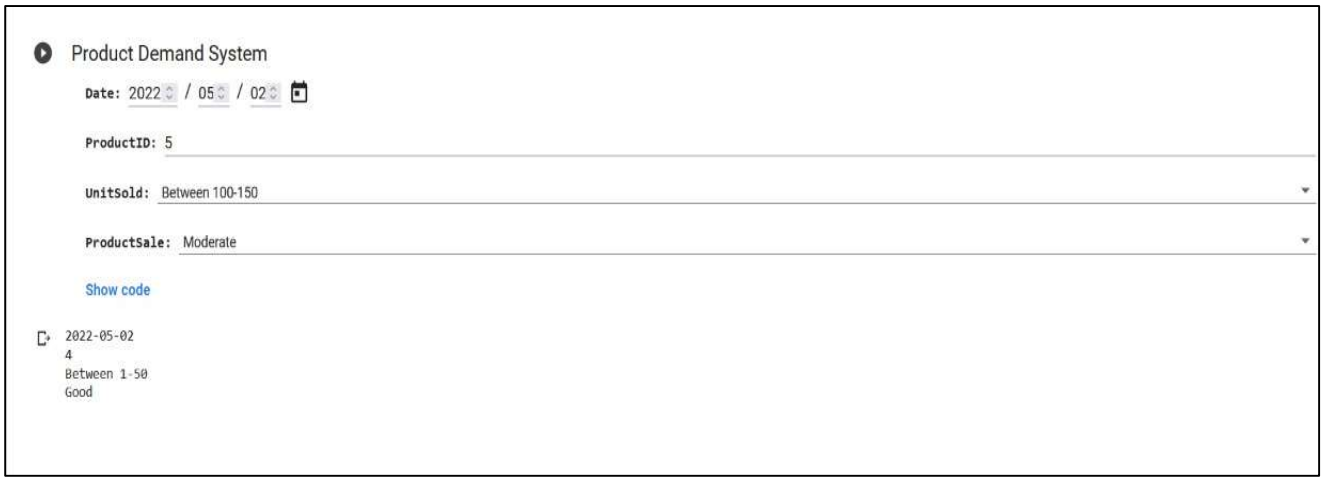
```
[ ] features = [["Total Price", "Base Price"]]
    features = np.array([[133.00, 140.00]])
    model.predict(features)
```

```
/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



CONCLUSION

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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