PREDICTING THE SALES OF PRODUCTS OF A RETAIL CHAIN

Internship Project Report

Submitted by

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DECLARATION

I **Zanha Jamal** hereby declare that the report of internship entitled **"PREDICTING THE SALES OF PRODUCTS OF A RETAIL CHAIN"** submitted to UST Global, is uniquely prepared after the completion of four months internship under the supervision and guidance of **Mr.Ashok G Nair**, Project Head DirectorII-Enterprise Solutions, UST Global Trivandrum.

I also confirm that the report is prepared for my academic requirement and not for any other purpose. It might not be used in the interest of the opposite party of the cooperation.

Date :11-08-2022

Place: Angamaly **Zanha Jamal**

ACKNOWLEDGEMENT

Gratitude is a feeling which is more eloquent than words, more silent than silence. The internship opportunity I had with UST Global Trivandrum was a great chance for learning and professional development. Therefore, I consider myself a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period

Bearing in mind previously I am using this opportunity to express my deepest gratitude and special thanks to **Mr. Ashok G Nair** , Director-II-Enterprise Solutions UST Global who in spite of being extraordinarily busy with his duties, took time out to hear, guide, and keep me on the correct path and allow me to carry out my project his guidance at their esteemed organization and extending during the training

I express my deepest thanks to **Ms. Gopika Bindu**, Associate II UST Global for taking part in useful decisions and giving necessary advice and guidance and arranging all facilities to make internship easier. I choose this moment to acknowledge her contribution gratefully

I express my heartfelt gratitude to **Ms. Minu Sebastian** for being a well-wisher and mentor throughout the internship.

I Would like to thank all the people who worked with me **Dennis Mathew and Kavya Boban** for their patience and help throughout this internship. I perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement, in order to attain my desired career objectives. Hope to continue cooperation with all of you in the future

sincerely

Zanha Jamal

ABSTRACT

Sales forecasting is the process of estimating future revenue by predicting the amount of product or services a sales unit will sell in the next week, month, quarter, or year.Meeting the demand is important to not lose potential revenue, while at the same time stocking excessive products could lead to losses. In this problem you are tasked with building a machine learning model to predict the sales of products across stores for one month. These models can then be used to power the recommendations for the inventory management software at these stores.

A large Indian retail chain has stores across 3 states in India: Maharashtra, Telangana and Kerala. These stores stock products across various categories such as FMCG (fast moving consumer goods), eatables / perishables and others. Managing the inventory is crucial for the revenue stream of the retail chain. Meeting the demand is important to not lose potential revenue, while at the same time stocking excessive products could lead to losses. In this problem you are tasked with building a machine learning model to predict the sales of products across stores for one month. These models can then be used to power the recommendations for the inventory management software at these stores.

Proposed system can therefore be used in order to optimize the production of products, such that there is always an optimal amount available. The proposed system is used nowadays by shops in order to better predict the number of products, that might get sold and therefore to better estimate how much product should be produced. The development of the system the organization can easily predict the monthly sales for a store and visualize the data for better insight

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Chapter 1

INTRODUCTION

Sales forecasting is the process of estimating future revenue by predicting the amount of product or services a sales unit will sell in the next week, month, quarter, or year.Meeting the demand is important to not lose potential revenue, while at the same time stocking excessive products could lead to losses. In this problem you are tasked with building a machine learning model to predict the sales of products across stores for one month.

By the development of the system the organization can easily predict the monthly sales for a store and visualize the data for better insight . This should then help to optimize the manufacturing process and thereby help to increase income and also power the recommendations for the inventory management software at these stores.

In this project,considering retail chain that has stores across 3 states in India. These stores stock products across various categories Managing the inventory is crucial for the revenue stream of the retail chain. Here we are predicting the monthly sale of products by considering certain features.so therefore we can estimate how much product should be produced.

Chapter 2

PROOF OF CONCEPT

The proposed system can therefore be used in order to optimize the production of products, such that there is always an optimal amount available. The proposed system is used nowadays by shops in order to better predict the number of products, that might get sold and therefore to better estimate how much product should be produced. By the development of the system the organization can easily predict the weekly sales for a store and visualize the data for better insight . This should then help to optimize the manufacturing process and thereby help to increase income while lowering costs.

This aims to develop a Machine Learning model that can predict the sales of products from different outlets. Several objectives were drawn to attain the goal.

Here I'm Focused on a particular features for predicting the monthly sale. predicting based on certain features such as product id,department id,outlet,selling price,sate etc. and then we will predict the sale of that certain product.So that we can manage the production of the products accordingly.

Chapter 3

IMPLEMENTATION

3.1 Technology Used

- **Jupyter Notebook**

  Jupyter notebook is an open-source IDE that is used to create Jupyter documents that can be created and shared with live codes. Also, it is a web-based interactive computational environment. The Jupyter notebook can support various languages that are popular in data science such as Python, Julia, Scala, R, etc. It offers a simple, streamlined, document-centric experience.

- **Python**

  Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntac- tical constructions than other language

- **Visual Studio Code**

  Visual Studio Code is a streamlined code editor with support for development operations like debugging, task running, and version control. It aims to provide just the tools a developer needs for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE.

- **Flask (Python Framework)**

  Flask is a web framework, it's a Python module that lets you develop web ap- plications easily. It's has a small and easy-to-extend core: it's a microframe- work that doesn't include an ORM (Object Relational Manager) or such fea- tures. It does have many cool features like url routing, template engine. It is a WSGI web app framework.

- **Figma**

  Figma is a powerful design tool that helps you to create anything: websites, applications, logos, and much more. By learning to use Figma, you'll take your first steps into User Interface Design and and User Experience Design

3.2 MODULES

1. Data collection
2. Data visualization
3. Data preprocessing
4. Data transformation
5. Model Training
6. Model Evaluation and Deployment

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3.3 DATASET

In this project one of the main step is importing the data set.the dataset is took from Kaggle. The data itself is stored in an excel sheet. The excel sheet contains three tables.They are,

1.productprices : which contain the prices of products at each store for each week.

2.datetoweekidmap : which is the mapping from a date to the weekid.

3.samplesubmission : which is the format for submissions

3.4 ALGORITHM USED

1. KNearest Neighbour
2. ExtraTreeReggrossor
3. Support Vector Machine
4. Random Forest Regression

Chapter 4

RESULT ANALYSIS

The result of the proposed project using machine learning lies in developing a handy web app that can be successfully used by an admin or an employee of the organization to get an insight into the data that's been collected.
The visualization of data helps in better understanding of the dataset and helps in improving the profit of the organization by producing the required product based on the prediction of stock of products on the monthly bases. The user of this application can save his or her time and also bring out the best.

Chapter 5

CONCLUSION

5.1 Conclusion

Proposed predicting the sale of products in a retail chain is to predict the sale of a particular product within a store using machine learning tools.we traind the model using mainly four algorithms says KNearestNeighbour,Support Vector Machine, extraTreeReggrossor and Random Forest Classifier.From which we choose extraTreeRegrrosser as it have maximum accuraccy and least error rate.And then we created the model.

In an addition to the current project, the website is being further modified using the react.js, and making the login of the website is being modified using the google-sign-in method and WhatsApp login.

Chapter 6

SCREENSHOTS

Here I add some sample screenshots of the project which includes,

- Data Visualization
- Home/Login screen
- Admin - Dashboard
- Admin - Stock Details
- Admin - Charts

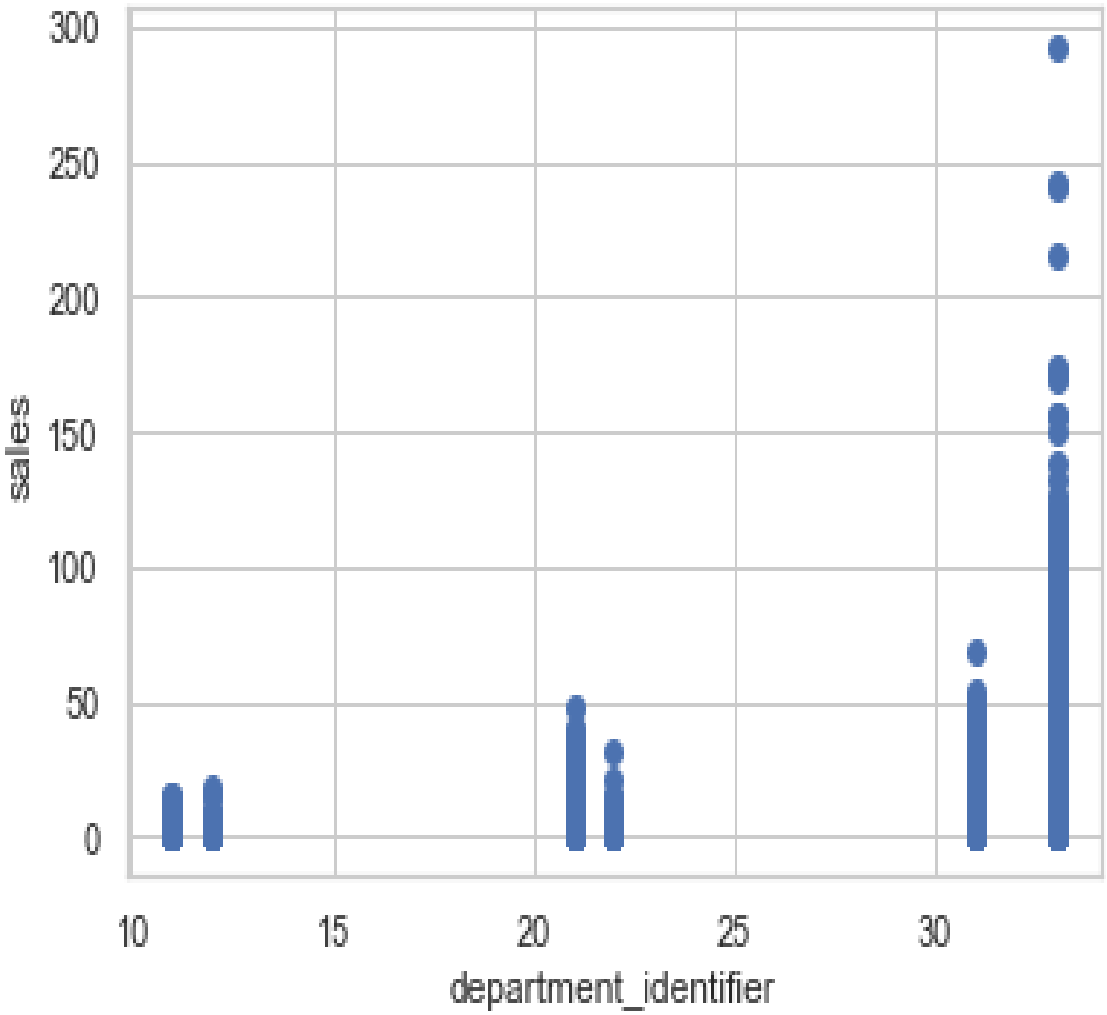

Figure 6.1: DeptId

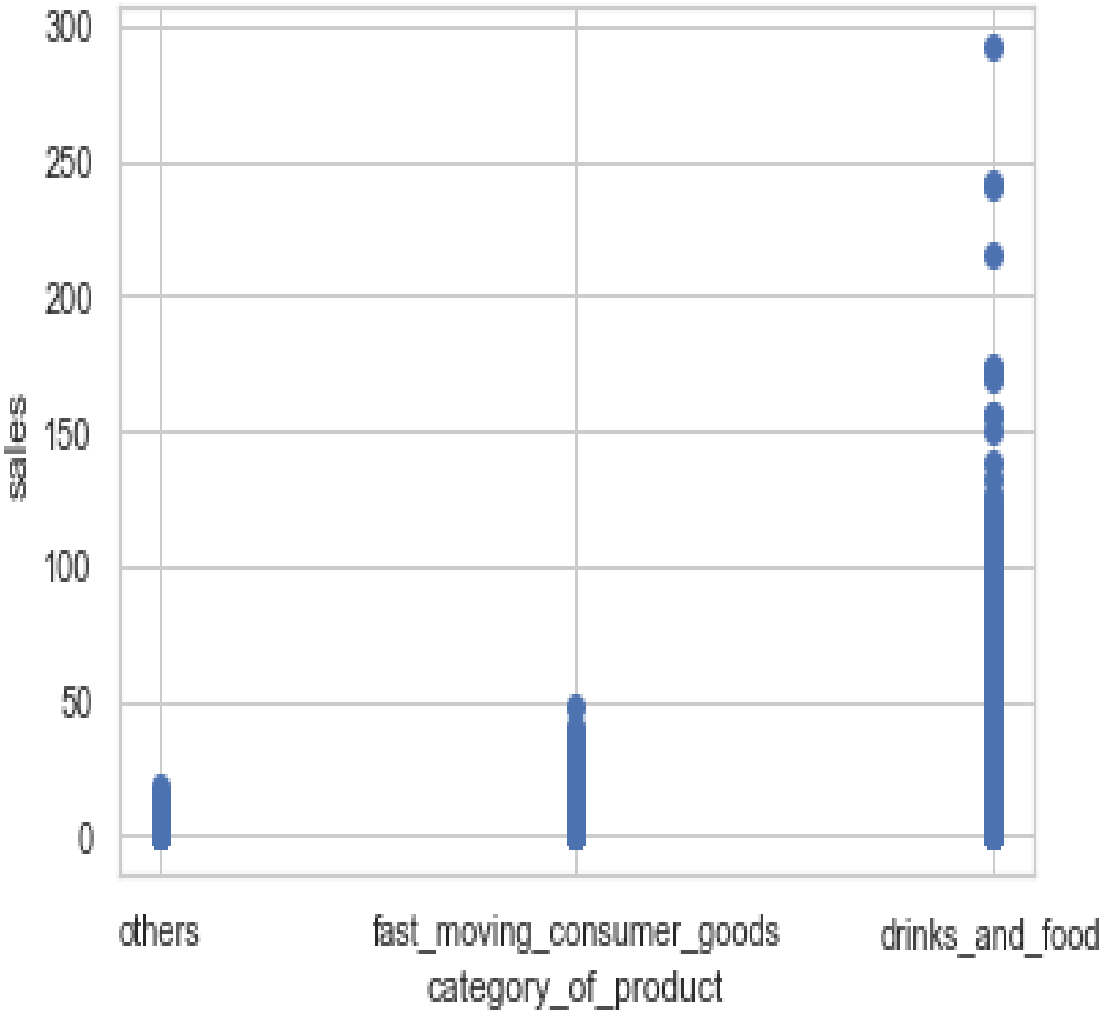

Figure 6.2: Catogory

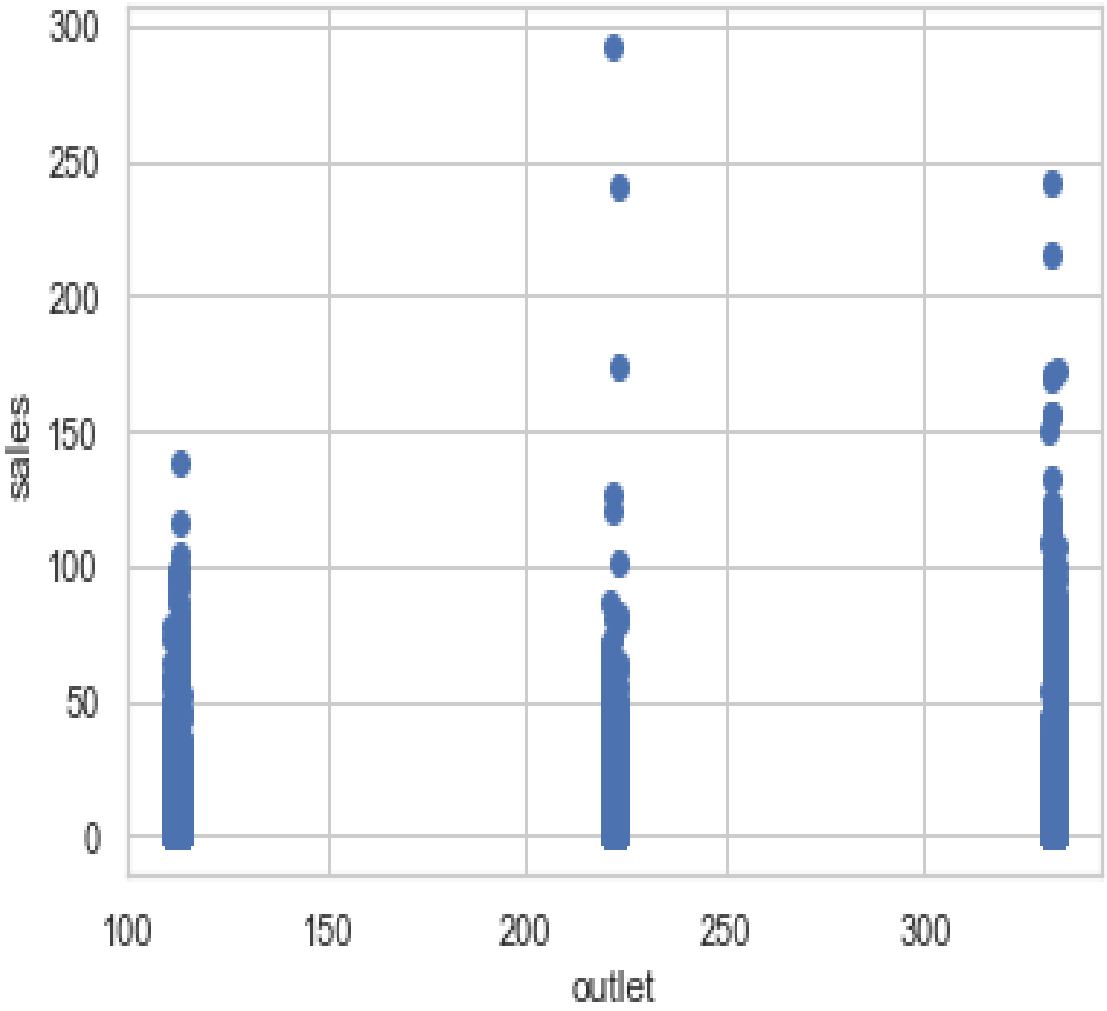

Figure 6.3: Outlet

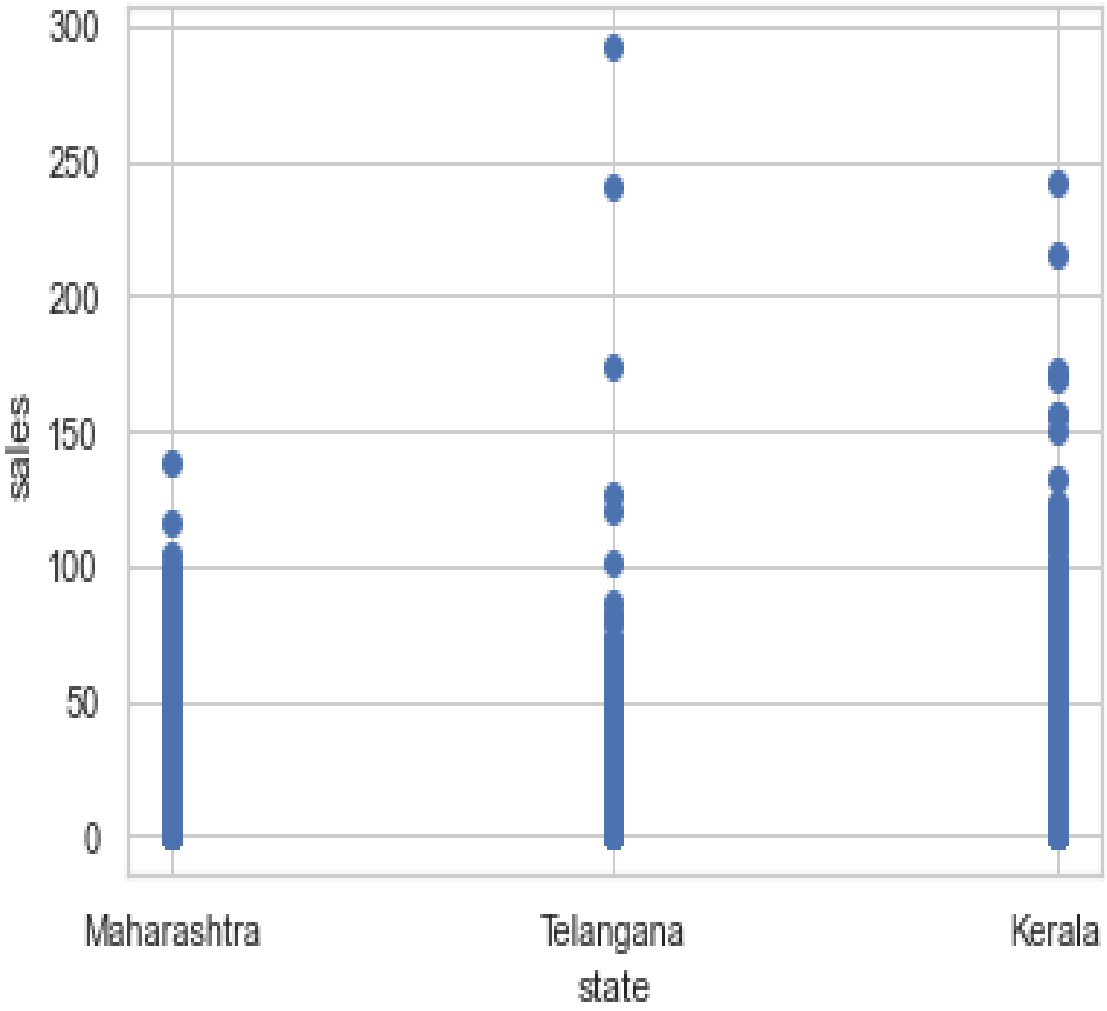

Figure 6.4: State

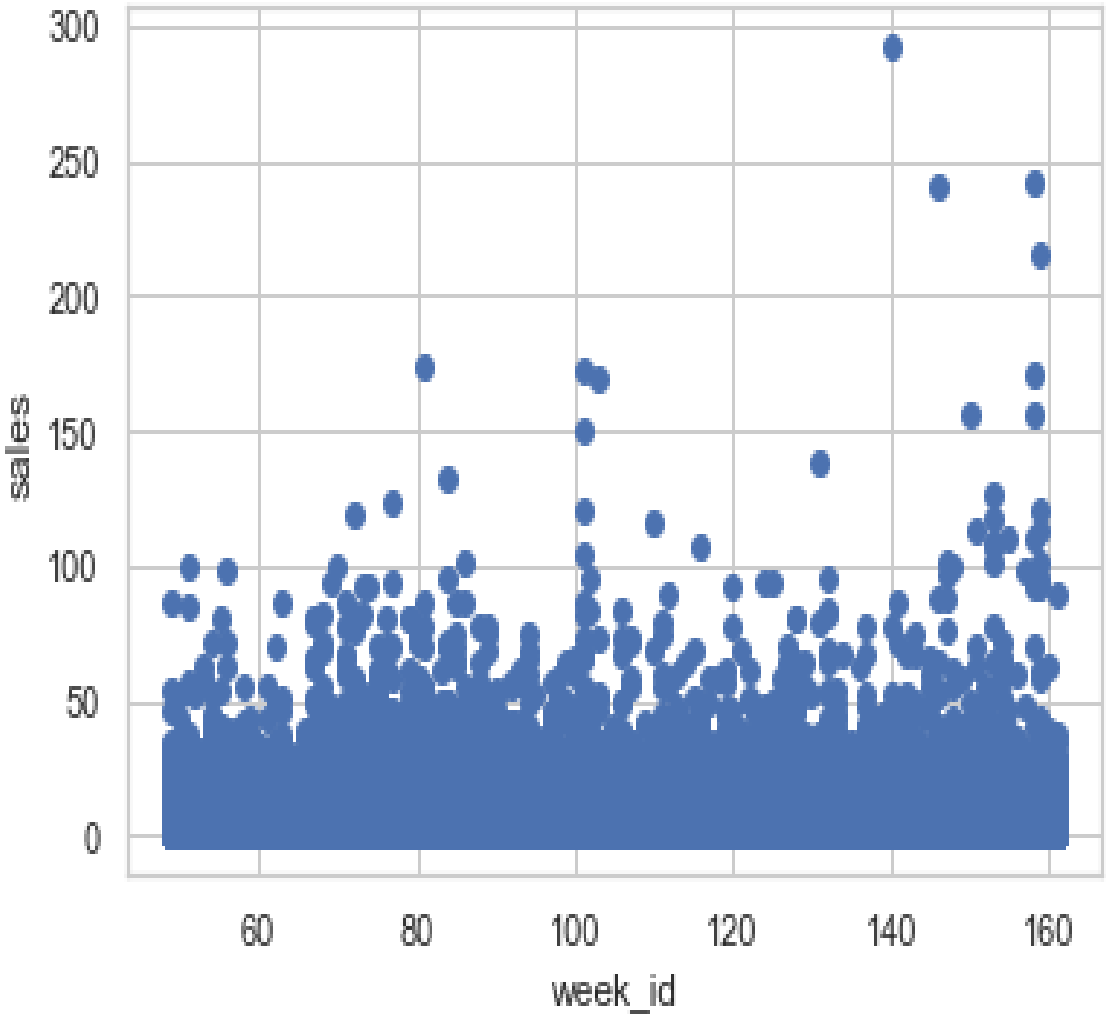

Figure 6.5: WeekId

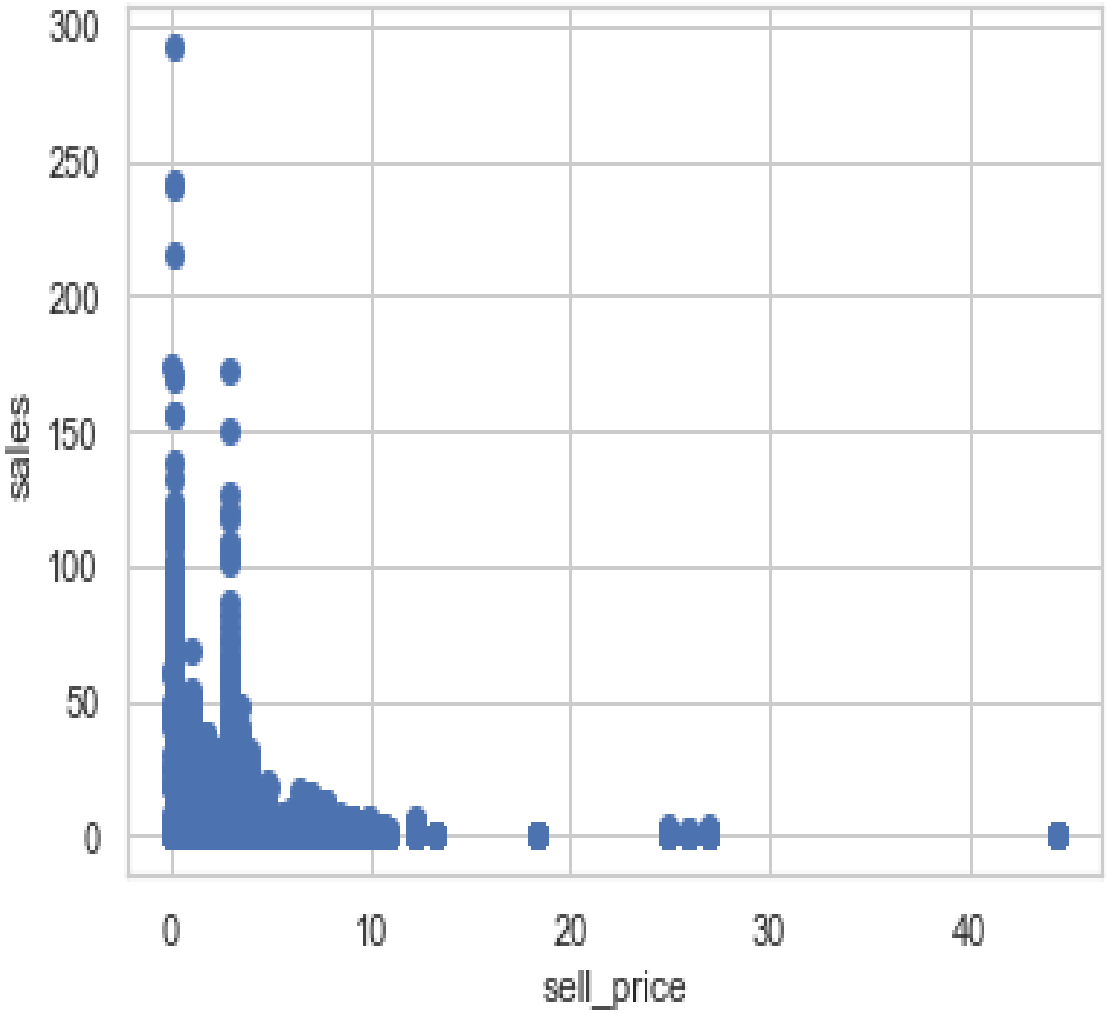

Figure 6.6: SellPrice

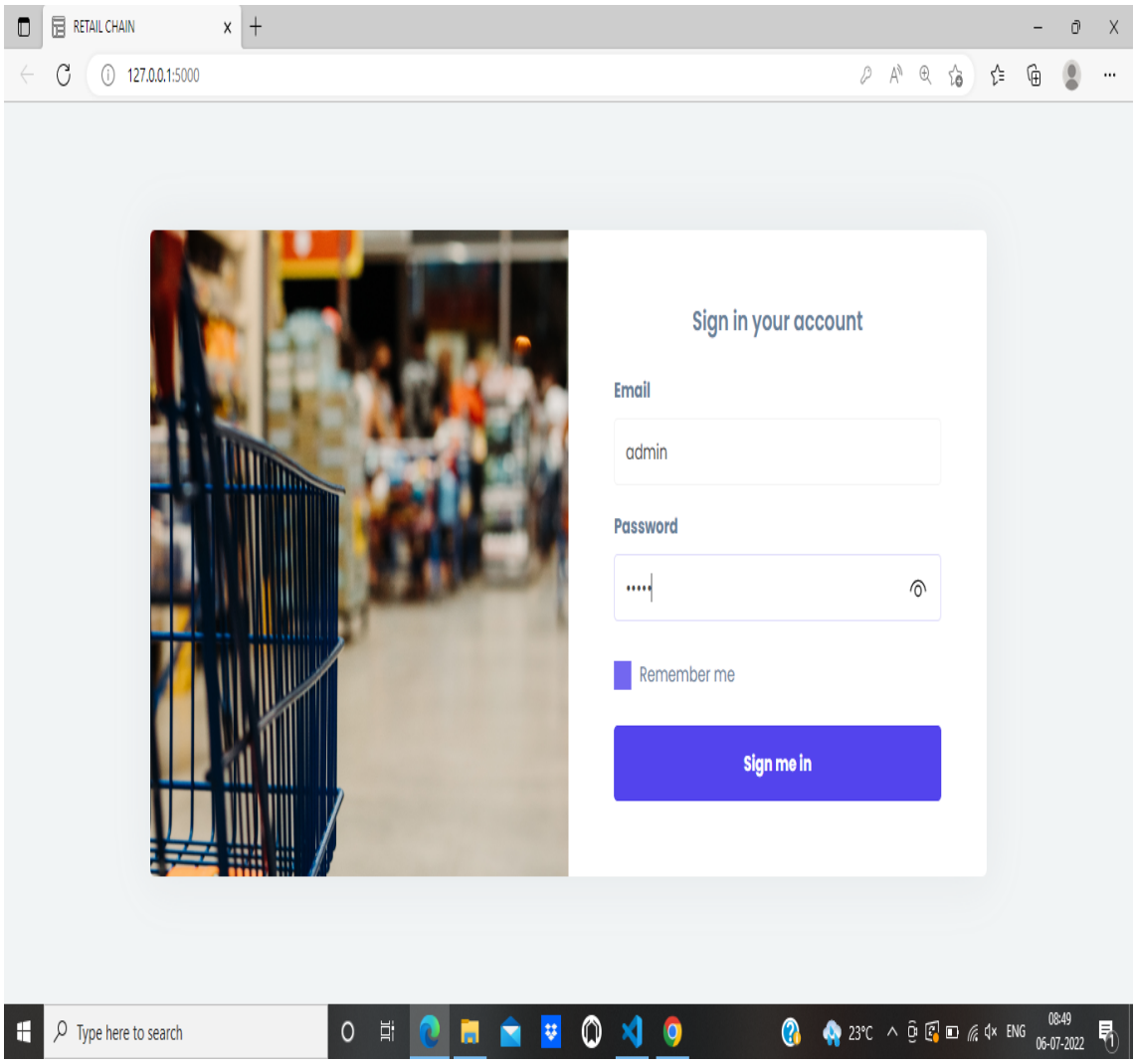

Figure 6.7: Login Screen

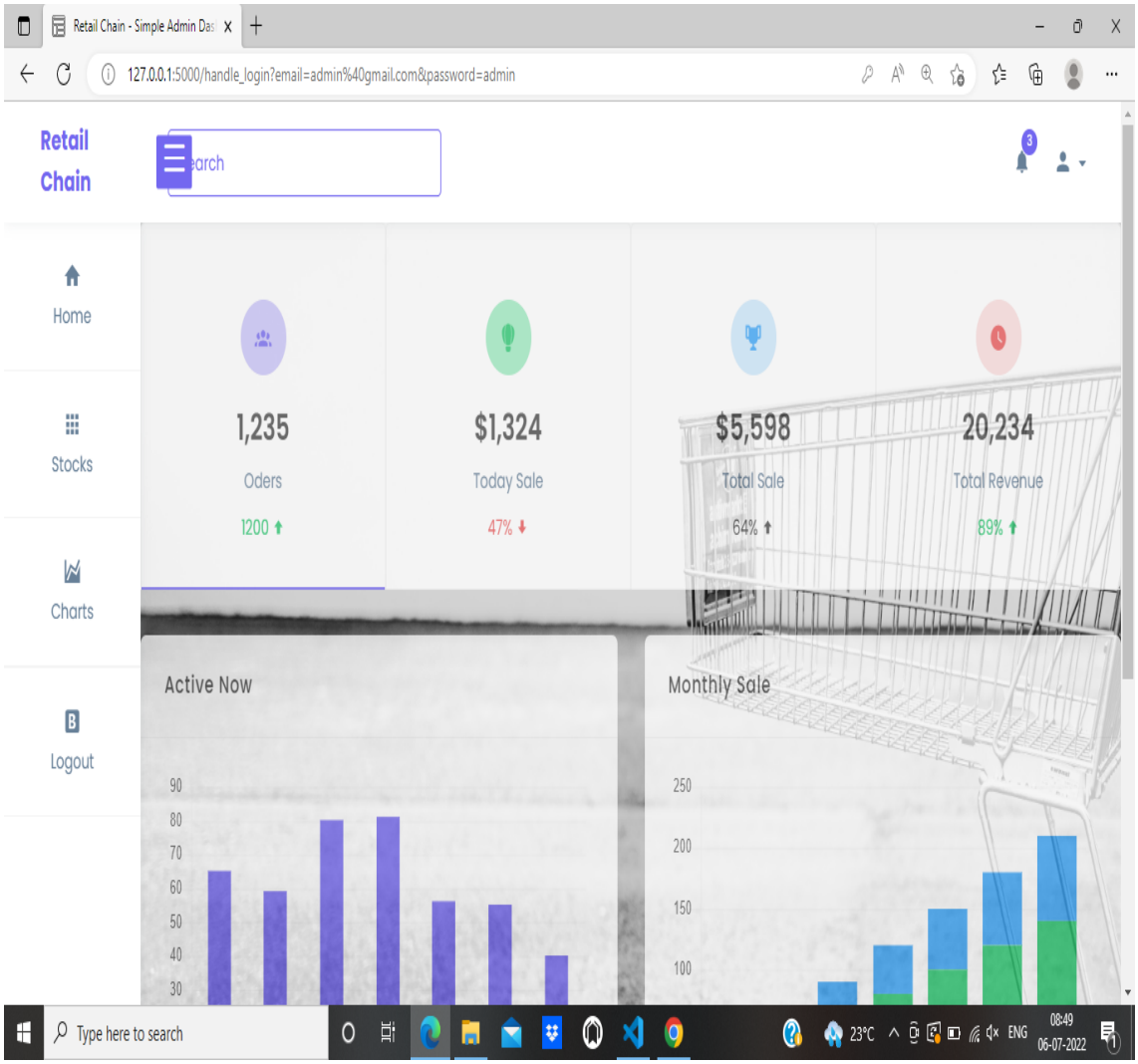

Figure 6.8: Admin-Dashboard

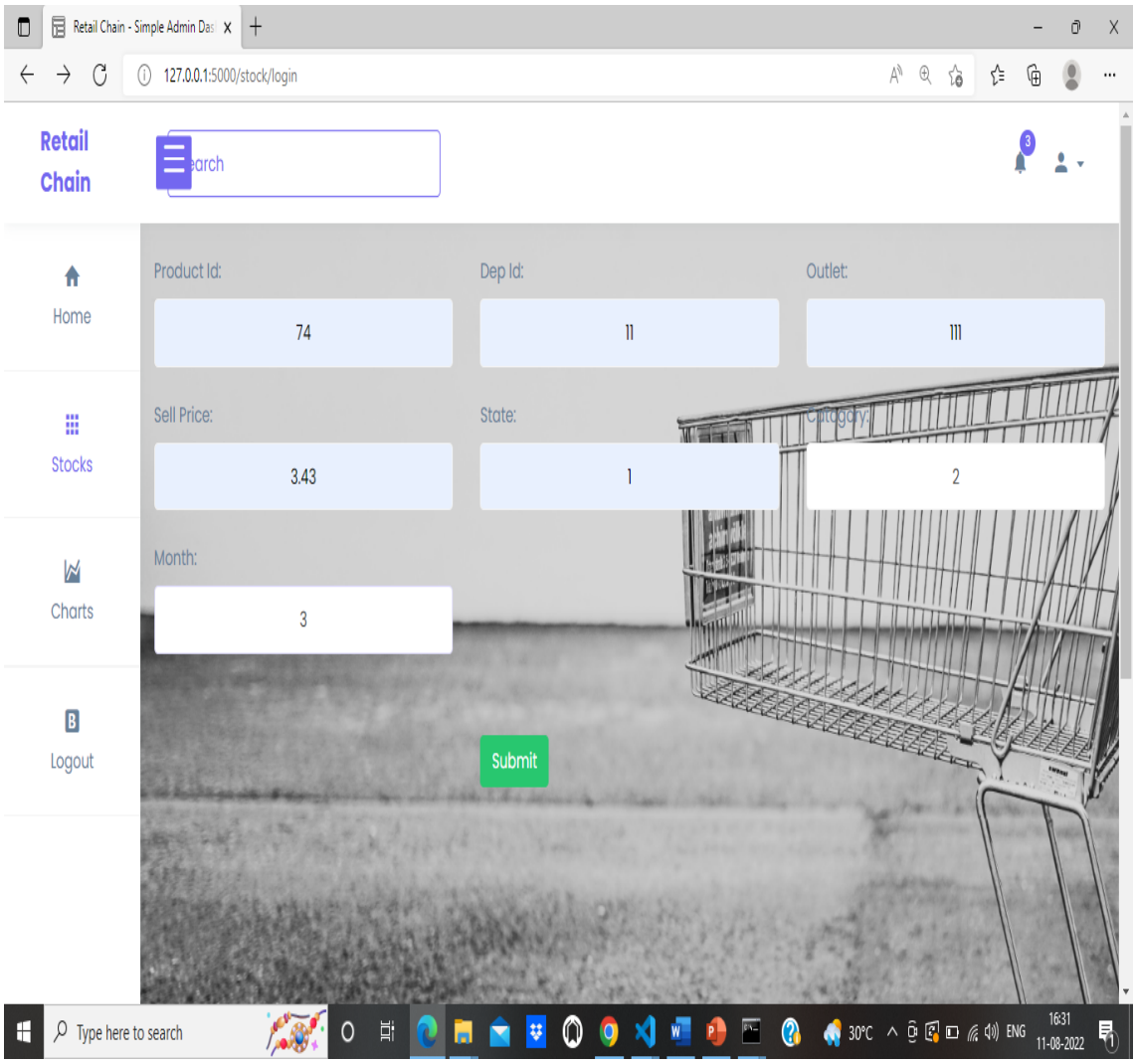

Figure 6.9: Stock

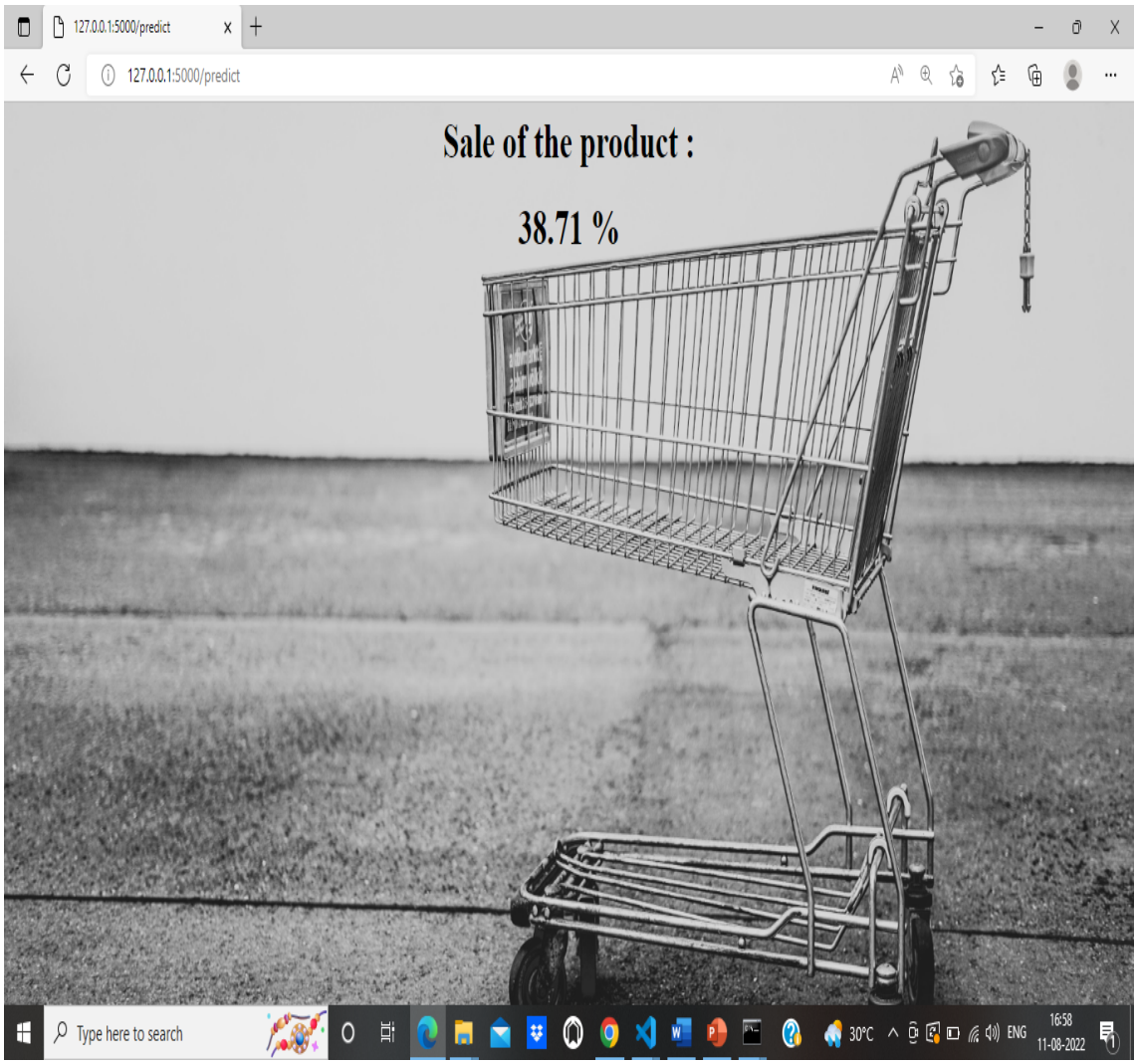

Figure 6.10: Predected Value

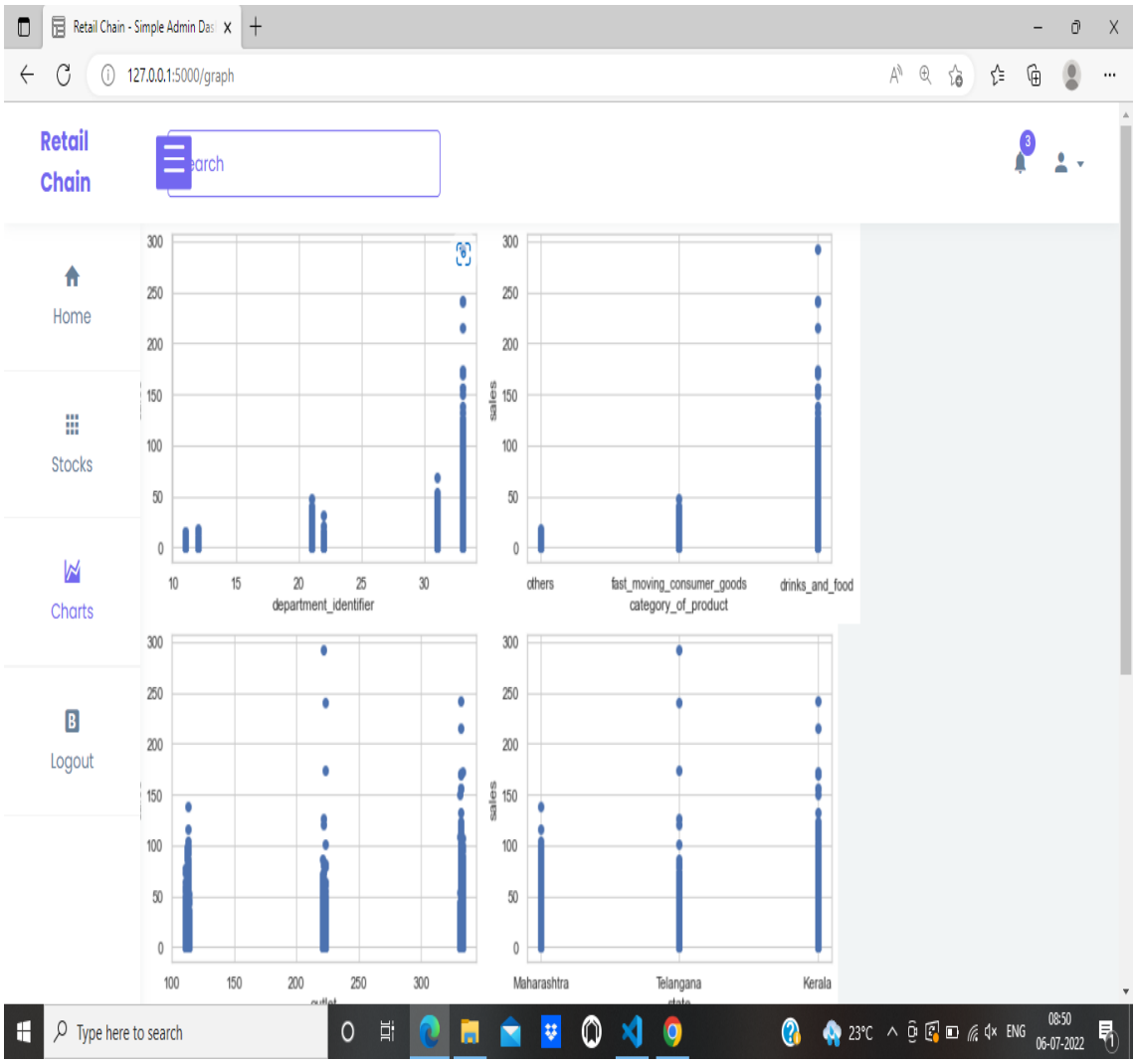

Figure 6.11: Graphs

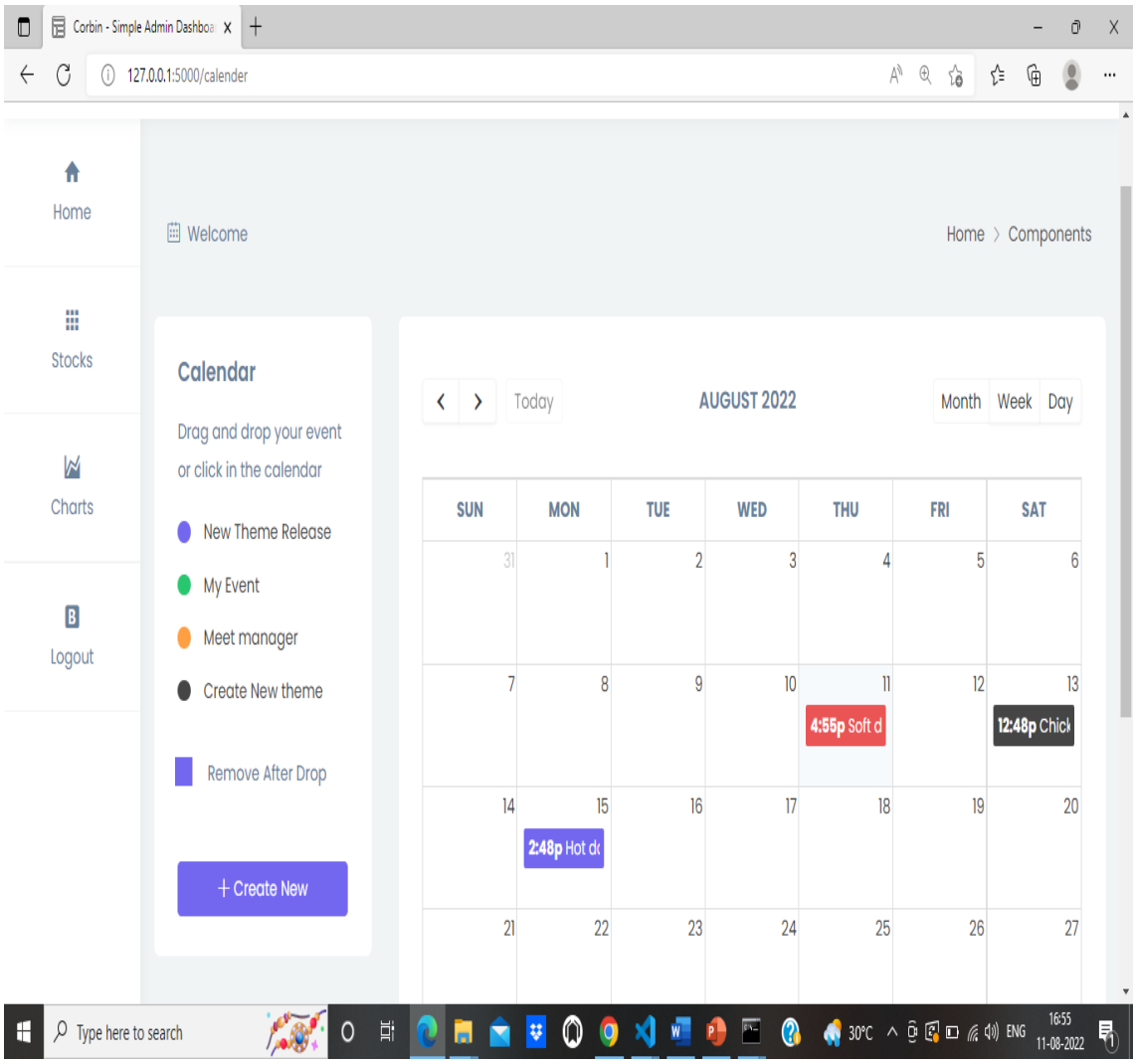

Figure 6.12: Calender