Proj ect report on

DEMAND EST - AI POWERED FOOD DEMAND FORECASTER

TEAM ID-PNT2022TMID4

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CONTENTS

LIST OF FIGURES

1. INTRODUCTION

1.1 OVERVIEW

Food wastage and raw materials deterioration are the most noteworthy predicaments faced by any food selling business. To avoid wastage, the restaurants should have prior knowledge of the amount of food required. Several solutions with the help of AI have been compounded to solve this problem of food wastage. Nevertheless, much of this research concentrates on the prediction of sales and its accuracy. It is important to note that sales prediction alone won't be enough to decrease food wastage. Predicting the number of raw materials required also plays a crucial role in reducing food wastage. Therefore, in this paper, a demand forecasting system is proposed that predicts the number of customers, sales for particular dishes, and the amount of raw materials required. Stacking technique is used in the proposed model for making the predictions. This model has been evaluated with the help of MAE metric and it ranges from 0.4 to 0.7. The proposed system will help the restaurant cook dishes and buy raw materials with minimum wastage

1.2 PURPOSE

The main aim of this project is to create an appropriate machine learning model to forecast then number of orders to gather raw materials for next ten weeks. To achieve this, we should know the information about offulfillment center like area, city etc., and meal information like category of food, sub category of food, price of the food or discount in particular week.By using this data, we can use any classification algorithm to forecast the quantity for 10 weeks. For this a web application is built which is integratedwith the model.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

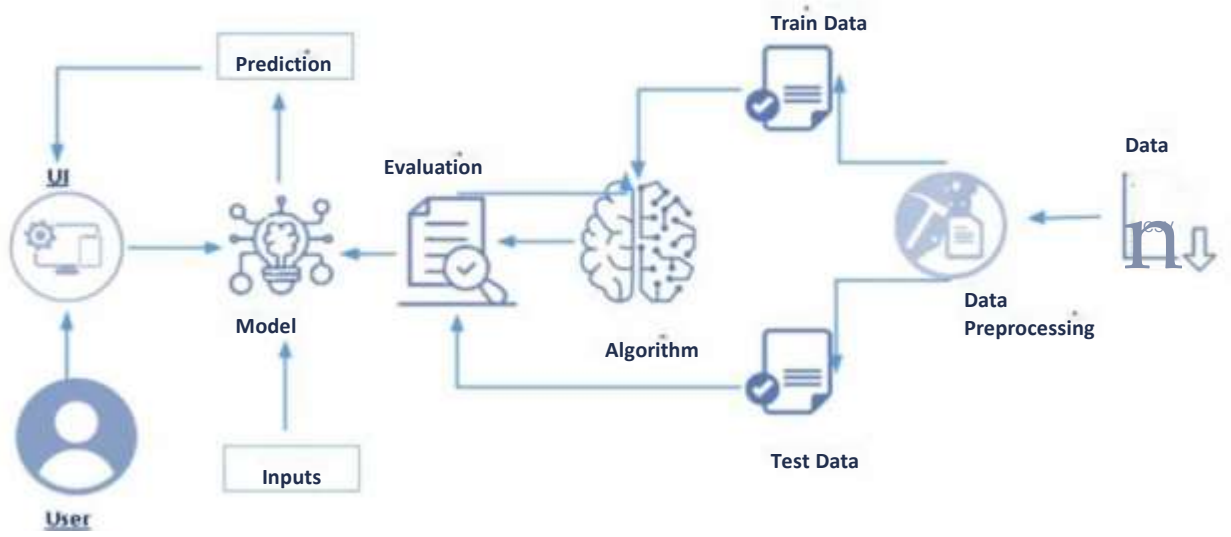
The replenishment of majority of raw materials is done on weekly basis andsince the raw material is perishable, the procurement planning is of utmost importance. Also the recruiting of staff members at the fulfillment centre is an prospect wherein the prediction of orders would be beneficial. Althoughthis is a process that can be done manually.

2.2 PROPOSED SOLUTION

Given the following information, the main task of this project is to build anmachine learning model to predict the demand for the next ten weeks forthe center-meal combinations in the test set.

3. THOERITICAL ANALYSIS

3.1 BLOCK DIAGRAM



3.2 HARDWARE/SOFTWARE DESIGNING

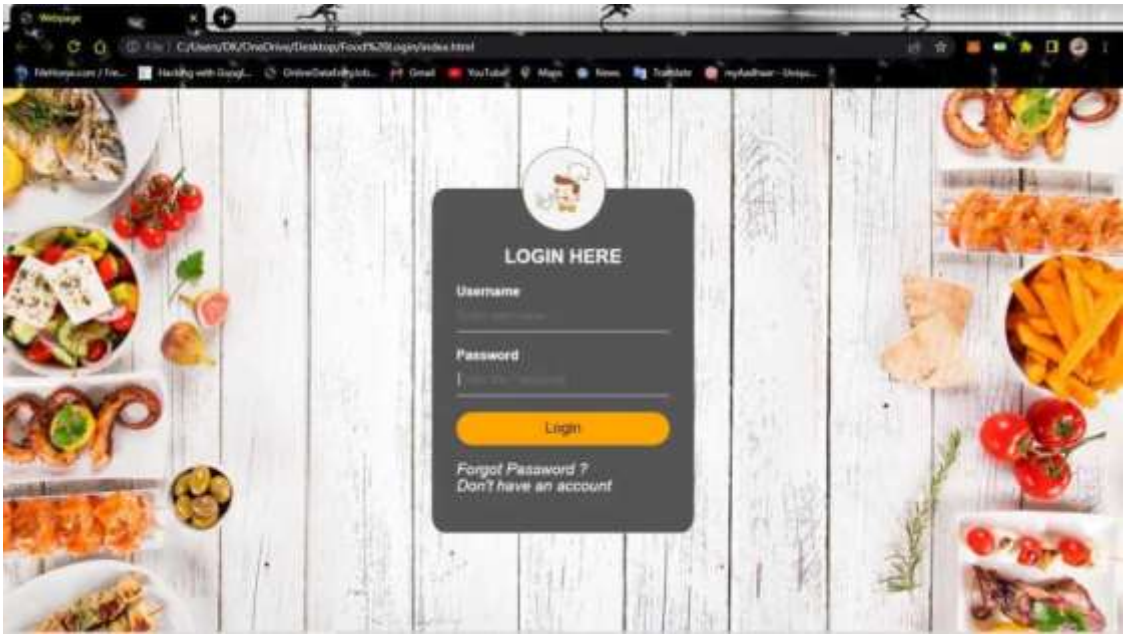
- IBM Cognos Analytics
- IBM Cloud
- Jupyter notebook
- Pycharm

4. FLOWCHART

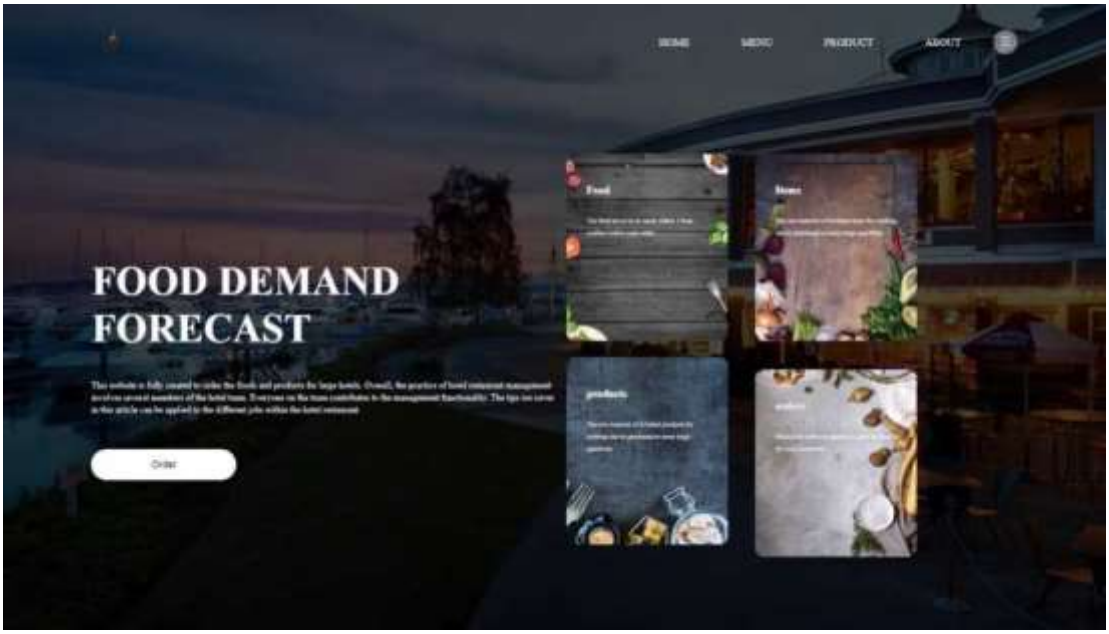
- The user interacts with the UI (User Interface) to upload the inputfeatures.
- Uploaded features/input is analyzed by the model which is integrated.
- Once the model analyses the uploaded inputs, the prediction isshowcased on the UI.

5. EXPERIMENT AND RESULTS

We have made an accurate predictive system for the analysis and prediction of the food demand for different food items at different places.



(figl. LOGIN PAGE)



(fig.2. HOME PAGE)

Tabic 5: Prediction results of the XGBoost and LSTM model on the lest dataset

Target	Predicted
1.267860	1.267744
1.268110	1.268210
1.268230	1.268661
1.268460	1.268563
1.268660	1.268538
1.252120	1.251820
1.252720	1.252840
1.252480	1.252201
1.252190	1.252538
1.252190	1.252215
1.252210	1.251961
1.252200	1.252945
1.251690	1.252231

(FIG.3. OUTPUT)

6. ADVANTAGE S/DISADVANTAGES

Advantages:

1. Food wastage will be minimized.
2. Simple and easy to use framework.

Disadvantages:

1. The output obtained may not be precised, due to the use of limiteddatasets.

7. APPLICATIONS

This project focuses on one food delivery client, which delivers food in many different cities through distribution networks and fulfillment centers.

8. CONCLUSION

The main moto behind this project is to reduce food wastage.The availability of the food items makes the society better. Our purposed modelwould definitely come handy to a company for predicting then number of food orders and help them to serve their customers better.

9. FUTURE SCOPE

1. Working on the frontend to make the framework more dynamic.
2. In the future, we also plan to improve forecasting accuracy andresearch on the efficiency of store management.

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-40715-1660633261