Low Level Design (LLD)

Restaurant Rating Prediction

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Contents

Abstract

Restaurants nowadays prefer taking online orders. It not only helps in getting effective customer feedback but also useful for managing orders easily. We are moving towards an automated and digital world. Having a significant online presence is necessary for any restaurant to be successful and prosperous. Getting customer feedback and analyzing them in an effective manner makes the difference. This study analyses the restaurant reviews and presents useful information that the ratings do not consider or overlook. Combined research is done using datasets of different restaurant features. Machine learning algorithms like Random Forest and Extra Tree regression is used for first classifying the reviews in proper aspects then performing EDA on them. Summarization is done using effective visualization techniques. Future work is also discussed so that an efficient analysis system can be developed utilizing the potential of reviews.

1. Introduction

Why this Low-Level Design Documentation?

The purpose of this documentation is detailed description of restaurant rating prediction system which will explain the purpose and the feature of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will perform under different parameters. This document is intended for both the stack holders and developers of the system and will be proposed for the higher management for its approval.

The main objective of the project is taking restaurant's location and services provided by them into consideration this model will predict the rating of the restaurant. The restaurants make sure that all the data is available at that time in order to get the optimum utilization of this system and earn maximum profits.

This project can be delivered in three phases

Phase 1: Building Machine learning model depending on the requirements.

Phase 2: Integration of UI and database to all the functionalities.

Phase 3: Deployment of project on cloud.

Scope

This software system will be a web application, this system will be designed to predicts the rating of the restaurant based on the user's input in which there are several categories to fill in like the online order, table booking, votes, location, restaurant type, dish liked, cuisines, cost of two person and type of restaurant. Based on these features model will predict the rating of a restaurant. We make sure that all the given features should be available at that time in order to get the optimum utilization and earn maximum profits by the company.

Constraints

It is a project based of Bangalore zomato restaurant data.

Out of scope

System will not be Perform good if restaurant is not in Bangalore region.

2. Technical Specifications

Dataset

Data	Finalized	Source
Zomato Restaurant	Yes	https://www.kaggle.com/himanshupoddar/zomato-bangalore-restaurants

Dataset Overview

51717 – rows

17 – columns

url	address	name	online_order	book_table	rate	votes	phone	location	rest_type	dish_liked	cuisines	approx_cost(for two people)	reviews_list	menu_item	listed_in(type)	listed_in(city)
https://	942, 21st	Jalsa	Yes	Yes	4.1/5	775	080	Banashanl	Casual Dir	Pasta, Lunch	North Indi	800	[('Rated 4.0', '	[]	Buffet	Banashankari
https://	2nd Floor	Spice El	Yes	No	4.1/5	787	080 4171	Banashanl	Casual Dir	Momos, Lun	Chinese, I	800	[('Rated 4.0', '	[]	Buffet	Banashankari
https://	1112, Ne	San Chu	Yes	No	3.8/5	918	+91 9663	Banashanl	Cafe, Casu	Churros, Can	Cafe, Mex	800	[('Rated 3.0', '	[]	Buffet	Banashankari
https://	1st Floor,	Addhuri	No	No	3.7/5	88	+91 9620	Banashanl	Quick Bite	Masala Dosa	South Indi	300	[('Rated 4.0', '	[]	Buffet	Banashankari
https://	10, 3rd Fl	Grand V	No	No	3.8/5	166	+91	Basavanag	Casual Dir	Panipuri, Go	North Indi	600	[('Rated 4.0', '	[]	Buffet	Banashankari
https://	37, 5-1, 4	Timepas	Yes	No	3.8/5	286	+91	Basavanag	Casual Dir	Onion Rings,	North Indi	600	[('Rated 3.0', '	[]	Buffet	Banashankari
https://	19/1, Ne	Rosewo	No	No	3.6/5	8	+91	Mysore Rc	Casual Dining		North Indi	800	[('Rated 5.0', '	[]	Buffet	Banashankari
https://	2469, 3rd	Onesta	Yes	Yes	4.6/5	2556	080	Banashanl	Casual Dir	Farmhouse F	Pizza, Cafe	600	[('Rated 5.0', '	[]	Cafes	Banashankari
https://	1, 30th M	Penthou	Yes	No	4.0/5	324	+91	Banashanl	Cafe	Pizza, Mockt	Cafe, Itali	700	[('Rated 3.0',	"RATED\n	I had been to this place with one of my fr	
e are a l	things te	service	('Rated 4.0'	'RATED\n A	\nTop f	no outdo	though	a nice pla	('Rated 1.	'RATED\n Lo	we had na	it turned out worse than the	('Rated 3.0'	""RATED\n S	parking facility	it was litt	[]
https://	2470, 21	Smaczne	Yes	No	4.2/5	504	+91	Banashanl	Cafe	Waffles, Pas	Cafe, Mex	550	[('Rated 4.0', '	[]	Cafes	Banashankari
https://	12,29 Ne	CafÃƒÂƒ	Yes	No	4.1/5	402	080	Banashanl	Cafe	Waffles, Pas	Cafe	500	[('Rated 4.0', '	[]	Cafes	Banashankari
https://	941, 3rd F	Cafe Shu	Yes	Yes	4.2/5	150	+91 9742	Banashanl	Cafe	Mocktails, P	Cafe, Itali	600	[('Rated 1.0', '	[]	Cafes	Banashankari
https://	6th Block	The Coff	Yes	Yes	4.2/5	164	+91 9731	Banashanl	Cafe	Coffee, Spag	Cafe, Chin	500	[('Rated 4.0', '	[]	Cafes	Banashankari
https://	111, Sapp	Caf-Elev	No	No	4.0/5	424	080 4957	Banashanl	Cafe	Sandwich, O	Cafe, Cont	450	[('Rated 2.0', '	[]	Cafes	Banashankari
https://	1112, Ne	San Chu	Yes	No	3.8/5	918	+91 9663	Banashanl	Cafe, Casu	Churros, Can	Cafe, Mex	800	[('Rated 3.0', '	[]	Cafes	Banashankari
https://	2303, 21s	Cafe Viv	Yes	No	3.8/5	90	080	Banashanl	Cafe	Garlic Bread,	Cafe	650	[('Rated 2.0', '	[]	Cafes	Banashankari
https://	241, 4th F	Catch-up	Yes	No	3.9/5	133	+91	Banashanl	Cafe	Momos, Mus	Cafe, Fast	800	[('Rated 1.0', '	[]	Cafes	Banashankari
https://	405, 24th	Kirthi's E	Yes	No	3.8/5	144	080	Banashanl	Cafe	Pasta, Gelat	Chinese, (	700	[('Rated 3.0', '	[]	Cafes	Banashankari
https://	504, CJ V	T3H Cafe	No	No	3.9/5	93	+91 8884	Banashanl	Cafe	Cheese Mag	Cafe, Itali	300	[('Rated 4.0', '	[]	Cafes	Banashankari
https://	47, 48 &4	360 Ator	Yes	No	3.1/5	13	+91 9880	Banashanl	Cafe		Cafe, Chin	400	[('Rated 5.0', '	[]	Cafes	Banashankari
https://	146, 50 ft	The Vint	Yes	No	3.0/5	62	+91	Banashanl	Cafe	Burgers, Car	Cafe, Fren	400	[('Rated 2.0', '	[]	Cafes	Banashankari
https://	3353, 2nd	Woodee	Yes	No	3.7/5	180	+91 7406	Banashanl	Cafe	Pizza, Garlic	Cafe, Pizz	500	[('Rated 3.0', '	[]	Cafes	Banashankari
https://	SRF Com	Cafe Col	No	No	3.6/5	28	080 3248	Banashanl	Cafe		Cafe, Fast	900	[('Rated 4.0', '	[]	Cafes	Banashankari

Input Schema

url	object
address	object
name	object
online_order	object
book_table	object
rate	object
votes	int64
phone	object
location	object
rest_type	object
dish_liked	object
cuisines	object
approx_cost(for two people)	object
reviews_list	object
menu_item	object
listed_in(type)	object
listed_in(city)	object

Predicting

- ✓ The system displays the restaurant rating according to the users input.
- ✓ The system presents the set of inputs required from the user.
- ✓ The user gives required information.
- ✓ The system should be able to predict the rating of restaurant for the information provided by the user.

Logging

- ✓ We have chosen File logging.
- ✓ System logs each and every system flow.
- ✓ Each and every user's input information is logged.

Database

The system stores each and every data given by the user or received on request to the database. We have used MongoDB.

Deployment

1. AWS

3. Technology stack

Frond End	HTML/CSS
Backend	Python Flask
Database	MongoDB
Deployment	AWS

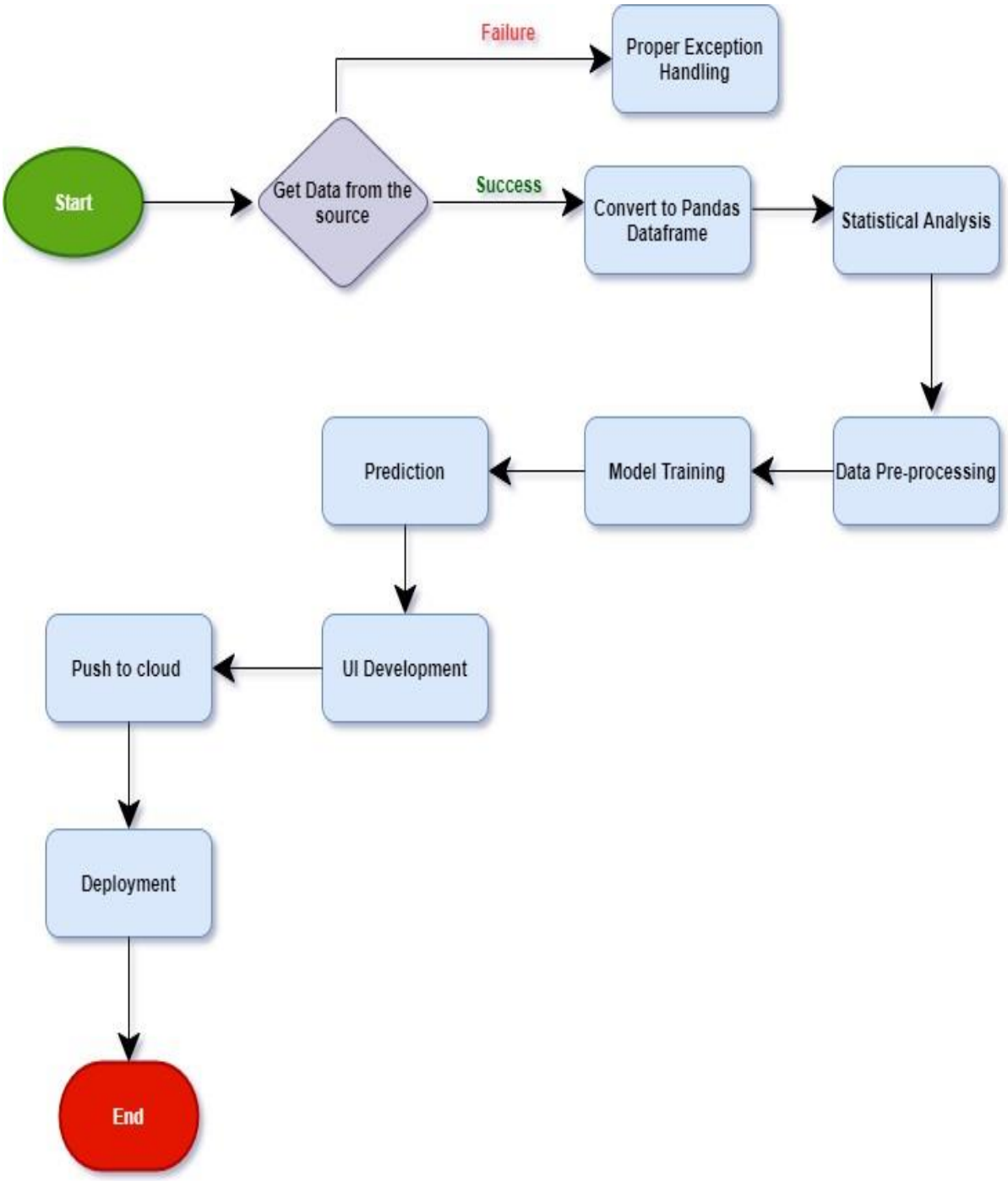
4. Proposed Solution

The restaurant industry is one of the prevailing competitive sectors. People enjoy cherishing communal dining for centuries, hence the demand for restaurants increasing day by day. Bangalore is a heaven for foodies with a range of cuisines from different parts of the world. In this paper, the data set for restaurants for a specific location is identified and the Data Visualization tools are applied to understand the trends and patterns of the food culture. This software proposes a model to understand the factors affecting the rating of restaurants. Machine learning and predictive analytics with wide spread range of tools and techniques aids to predict the rating of restaurants. In this paper model is built using various regression algorithms and the most efficient algorithm is considered. The result of this model helps new restaurants in deciding their menu, cuisine, theme, cost, demographic location etc. thereby increasing the business.

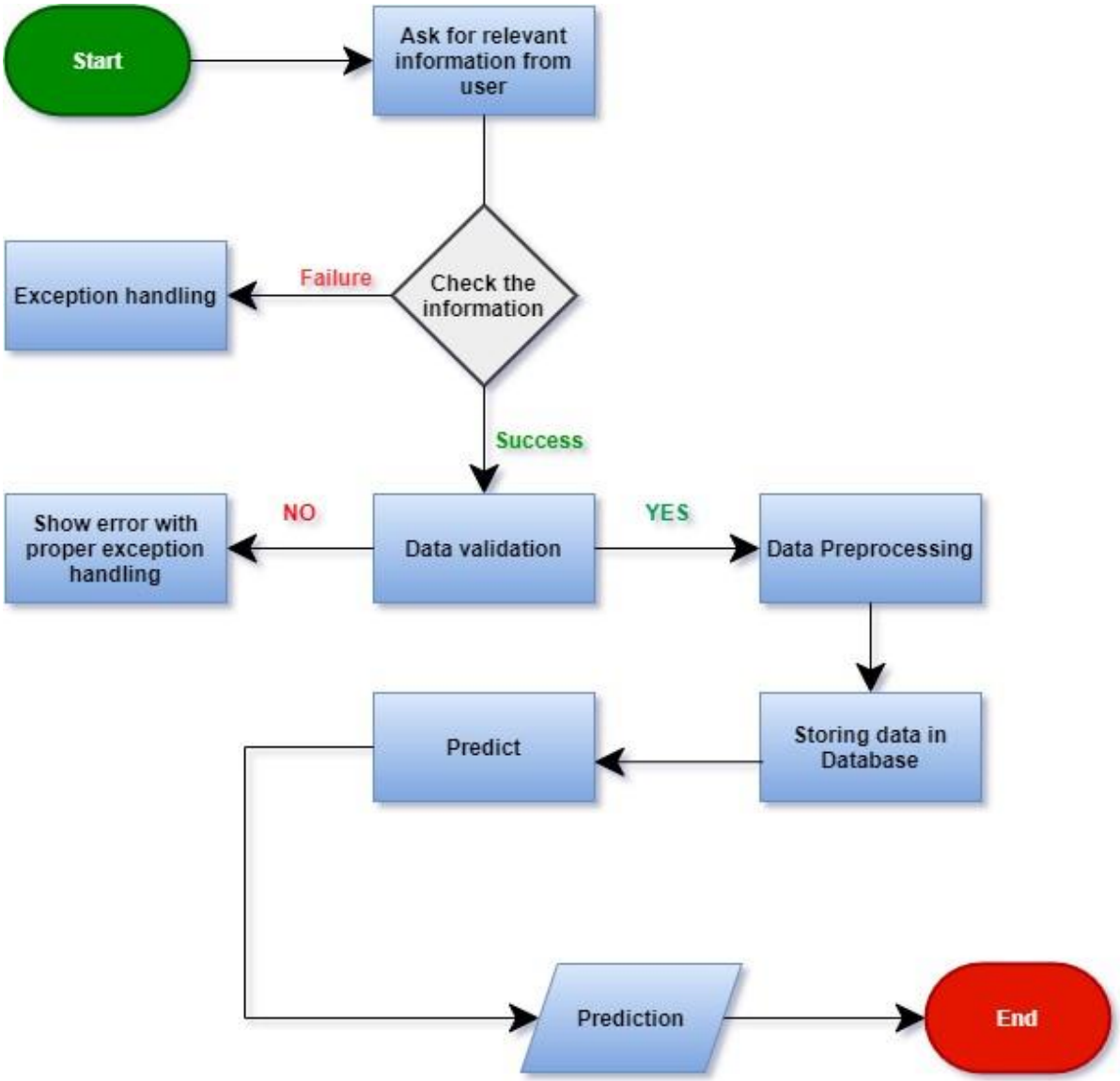
Taking different features into consideration we have created a machine learning model which will predict the rating of a restaurant.

This is a regression problem statement. We will be using linear regression and followed by the other regression algorithms in case we are not satisfied with pervious model performance, as the data is not very huge our main aim is to complete this use case with machine learning algorithm as a best optimized solution, In future if we are expected to get more data and different categories, if needed we might use deep-learning algorithm to get best solution.

5. Model training/validation workflow



6. User I/O workflow



7. Test cases (if any)

Test Case Description	Pre-Requisite	Expected Result
Verify whether the Application URL is accessible to the user	Application URL should be defined	Application URL should be accessible to the user
Verify whether the Application loads completely for the user when the URL is accessed	1. Application URL is accessible 2. Application is deployed	The Application should load completely for the user when the URL is accessed
Verify whether user is able to edit all input fields	1. Application is accessible 2. User is logged in to the application	User should be able to edit all input fields
Verify whether user gets Submit button to submit the inputs	1. Application is accessible 2. User is logged in to the application	User should get Submit button to submit the inputs
Verify whether user is presented with recommended results on clicking submit	1. Application is accessible 2. User is logged in to the application	User should be presented with recommended results on clicking submit
Verify whether the recommended results are in accordance to the selections user made	1. Application is accessible 2. User is logged in to the application	The recommended results should be in accordance to the selections user made
Verify whether is going to inappropriate page or URL it should go to the desired error page.	1. Application is accessible 2. User is logged in to the application	Recommended error page should be according to the Error/issue.