



**SKILL DEVELOPMENT PROJECT-1
E-COMMERCE BUSINESS SYSTEM
PROJECT REVIEW DOCUMENTATION
MEALMATE**

BY:

BATCH 26

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The Main Cause for opting the Business Domain:

Ecommerce, also known as Electronic Commerce or Internet Commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet.

The E-Commerce models that describe the transaction taking place between the Customers and Business Systems is categorized in various forms namely,

1. Business to Consumer (B2C)
2. Business to Business (B2B)
3. Consumer to Consumer (C2C)
4. Consumer to Business (C2B)



Why E-Commerce?

It has been a vast application and that made us consider it as an opportunity to explore more and to analyze, to connect it to solve our root cause. We're more into bringing maximum number of platforms into action. E-Commerce is a large and diverse application. So, we needn't be restricted to a particular domain. This provides integrity among all the other domains and gets the best possible outcome.

Advantages of E-Commerce

- E-commerce provides the sellers with a global reach. They remove the barrier of place ([geography](#)). Now sellers and buyers can meet in the virtual world, without the hindrance of location.
- Electronic commerce will substantially lower the transaction cost. It eliminates many fixed costs of maintaining brick and mortar shops. This allows the companies to enjoy a much higher margin of profit.
- It provides quick delivery of goods with very little effort on part of the customer. [Customer](#) complaints are also addressed quickly. It also saves time, energy and effort for both the consumers and the company.
- One other great advantage is the convenience it offers. A customer can shop 24x7. The website is functional at all times, it does not have working hours like a shop.



Our Project Objective:

We provide online food services based on the Business to Consumer (B2C) e-commerce model. There's often a little worry that prompts a question that if the food that we consume is actually healthy? Be it at a restaurant or your home, we often doubt that.

So, we are developing an e-commerce site which provides the consumers with all the information that they need to know, right from the manufacturing unit details to the calorie consumption of a particular food type. We also provide the same to our collaborators, and set a quality standard.

We keep the food yummy and interesting. From top-rated favorite's and health-conscious options to Premium dishes and more, variety is always on the menu. We guarantee the freshness of all our ingredients and deliver them in an insulated box right to your door. Follow our easy step-by-step recipes to learn new skills, try new tastes, and make your family amazing meals.

Now, to make it top-notch, a little fun with satisfaction and most importantly- healthy, we have a separate wing called the **MEAL MATE PRO**, where you can grow all the vegetables of your choice, all by yourself!

Not just this, we have come with many more classifications to make this easily accessible by anyone, more specialized categories for any type of consumer, etc. This is clearly explained in the following few pages.

E-Commerce for Our Business:

1. Custom Online Ordering:

Through our website consumers can see the detailed cooking recipe and every minute intake after customizing their food item and also can order the food online on their interest with customized plans provided with nutritional values of each and every item and specifying whether it is recommended for him or not.

2. Business Merchandise:

Cook-books, kitchen essentials, wines and many more.

3. Left Over food management/ Food Donation:

Nowadays a lot of food is being wasted at any kind of event, or just at our own home. So we request our users to don't waste the leftovers, yet take a step before hand by making sure we provide multiple choices to order, based on their food consumption level.

So, interested users can reach us and help the needy with that food. We conduct food donations camps and also organizations/ trusts and can reach us on our website.

4. Food customization:

User can reach us and provide his/her own interest in the sense what type of food they want to eat and how much food they want and this is achieved by providing users the calorie intake for each item and asking feedback on the amount of food served and finally serving as per his records so that wastage of food is reduced and we offer plans so that our system will take care of all these plans and quantity needed.

Our End-Users:

1. General Consumers
2. Restaurants
3. Hospitalized People
4. Trusts / Organizations

MealMate

Cart Login

Food Kitchen Tools Wines

TOP FOOD

[View All](#)

Lamb Chops with Panko-Crusted Purple Carrots
Salsa Verde Carrots & Garlicky Purple Onions
\$20.00/SERVING
15 min

Calabrian Shrimp & Orzo
with Tomatoes & Parmesan Cheese
Price: \$20.99/SERVING
20 min

Mongolian Beef & Noodle
with Shishito Peppers & Scallions
Price: \$21.99/SERVING
25 min

Navigation

- [Home](#)
- [About](#)
- [Menu](#)
- [Kitchen Tools](#)
- [Contact](#)

Here You Can Find Us...!

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Opp CPR Hotel Fortune, Murali Park, MG Rd
Labbipet, Vijayawada
Andhra Pradesh, 520010, India

MEALMATE
SINCE 2026

f in tw y m

Creator: SDP PROJECT 26

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Have questions? Talk with MealMate our Virtual Assistant.

Software Engineering:

USING SOFTWARE ENGINEERING TO DEVELOP “MEALMATE”-

Many companies in the food industry during the last forty years have based their business strategy on the continuous introduction of new products. The processing companies introduce a wide range of new ingredients; the manufacturing companies launch thousands (maybe millions!) of new consumer products; supermarkets present a continuous change of many thousands of products.; the food service companies continuously change their menus; and even the primary producers change the raw materials. This product development represents a central company activity, involving top management (our teammates!), research and development, production, marketing and financial departments, as well as the teams and individuals involved in the day-to-day product development project. There's a lot to understand and implement, from a small feature- satisfaction to a big valuable product which thrives and strives to give a needy solution to an existing problem. So,

Important factors to check are:

1. Knowledge-seeking objectives and methods;
2. Coordination of product, processing and marketing research;
3. Integration of consumer research into the total programme;
4. Evaluation of the market, in the early stages and before launching;
5. Financial soundness of the projects;
6. Management involvement in product development;
7. 'Go/no-go' decisions by the team at all critical points;
8. Leadership by the experienced;
9. Resources for product development.

Emergence of formal stages

1. Business Strategy
2. Product and process development
3. Product testing
4. Market testing
5. Product launch preparation
6. Product launch
7. Post launch evaluation

The four main stages are:

1. Product strategy development identifies the project and the product area;
2. Product design and process development create the product and process;
3. Product commercialization designs marketing, production, distribution;
4. Product launch and evaluation organize production, launch, post-launch.

Each stage has activities which produce outcomes, and on these outcomes the management decisions are made.

STAGE 1: PRODUCT STRATEGY DEVELOPMENT

This stage ends with decisions on the type of product to develop and the viability of the project for the company; the two main outcomes on which the decisions are based are respectively the product design specifications (the product concept) and the project evaluation (the product report).

The activities therefore form two interlocking groups - one developing product ideas and

product concepts, and the other gathering the information and analyzing it for the production, marketing, financial, legal, environmental and social evaluations.

Some of the important pathways of activities, outcomes and decisions in the first stage are:

Activities	Outcomes	Decisions
Business Strategy	Product mix strategy	New product areas
Change prediction	PD possibilities	PD plan
Information search	PD project identified	Project aim
Idea generation	Product concepts	Product concept selected
Concept engineering	Design specifications	Technical acceptance
Market analysis	Sales/profits prediction	Market acceptance

General Idea:

Product Development Process: stages, decisions, outcomes;

Product development project: aims, objectives, constraints, activities, techniques;

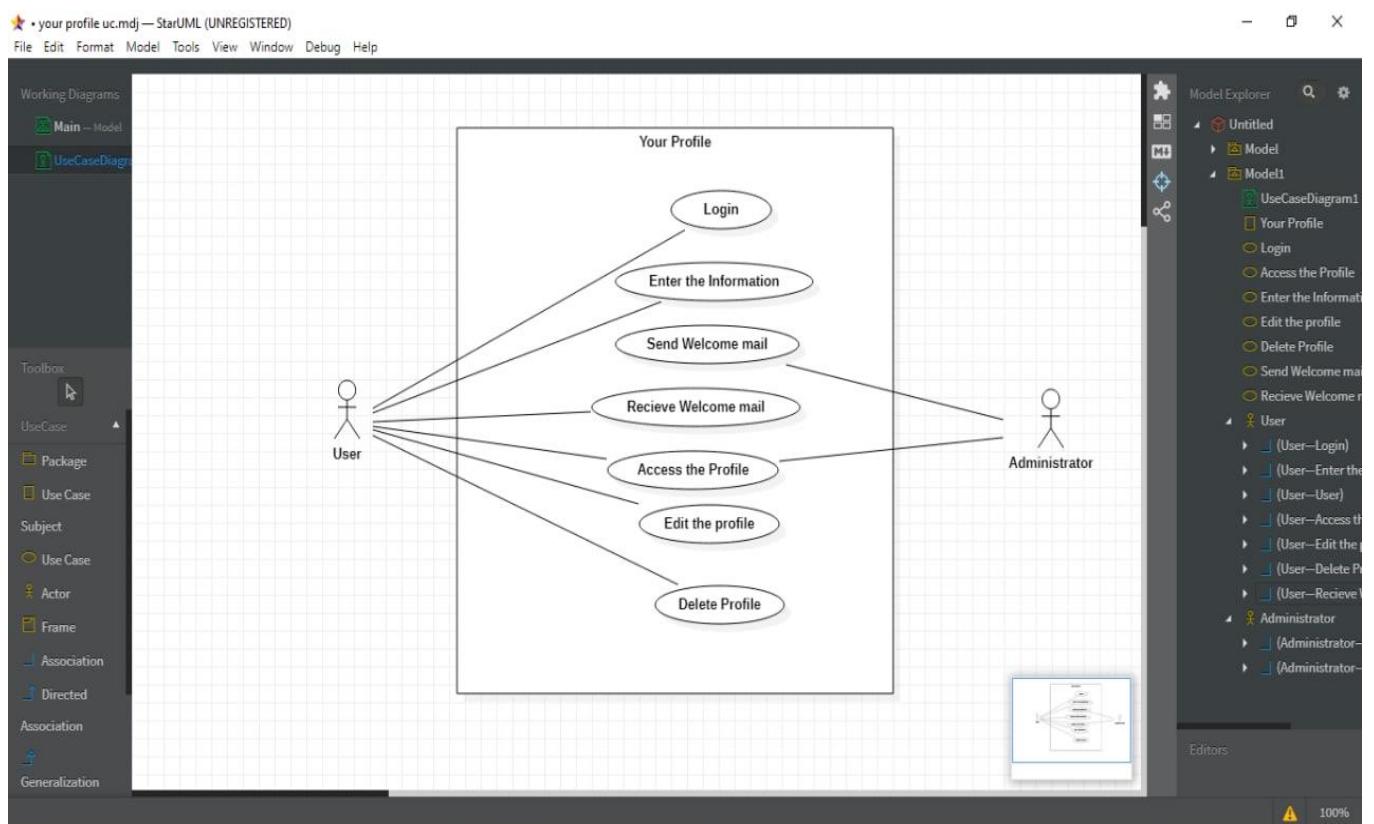
Integration of research areas: product, processing, consumer, market;

Integration of product design and process development: systematic design, quantitative

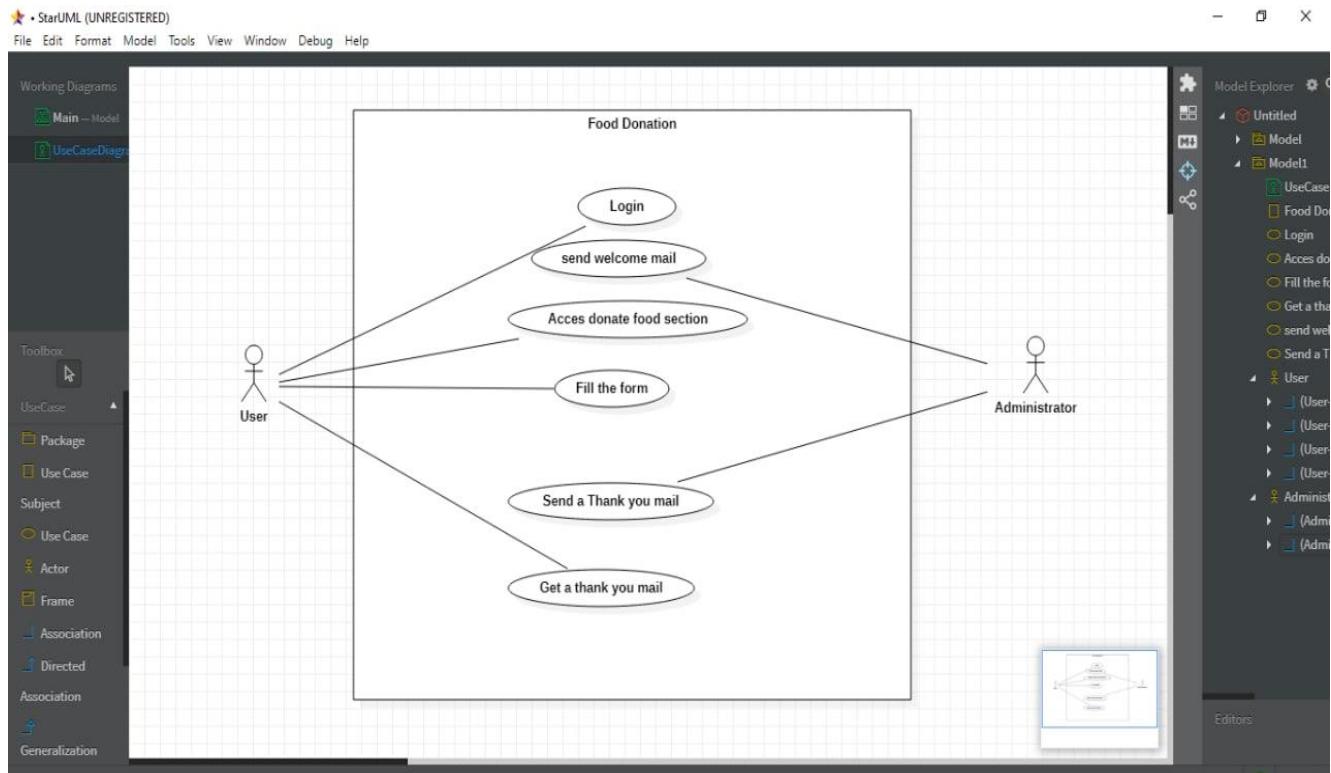
product qualities, product testing.

USECASE:

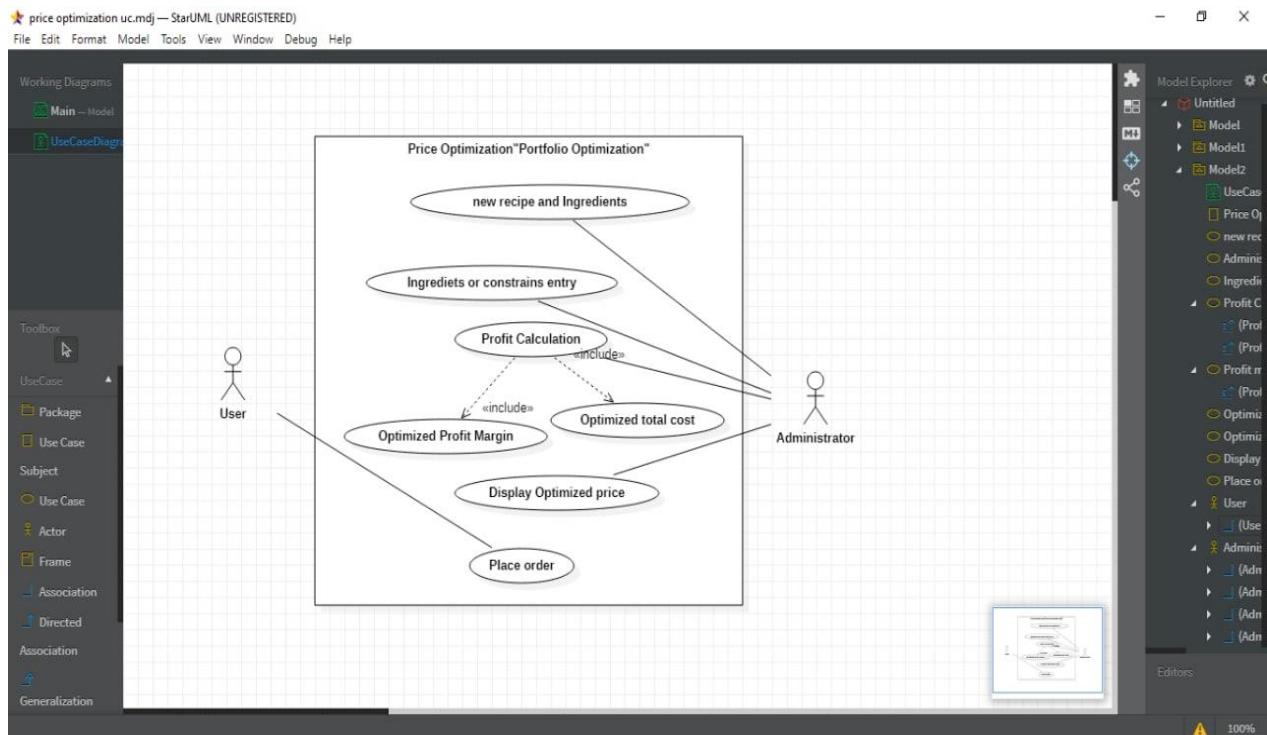
Your Profile Use Case Diagram:



Food donation Use Case Diagram:



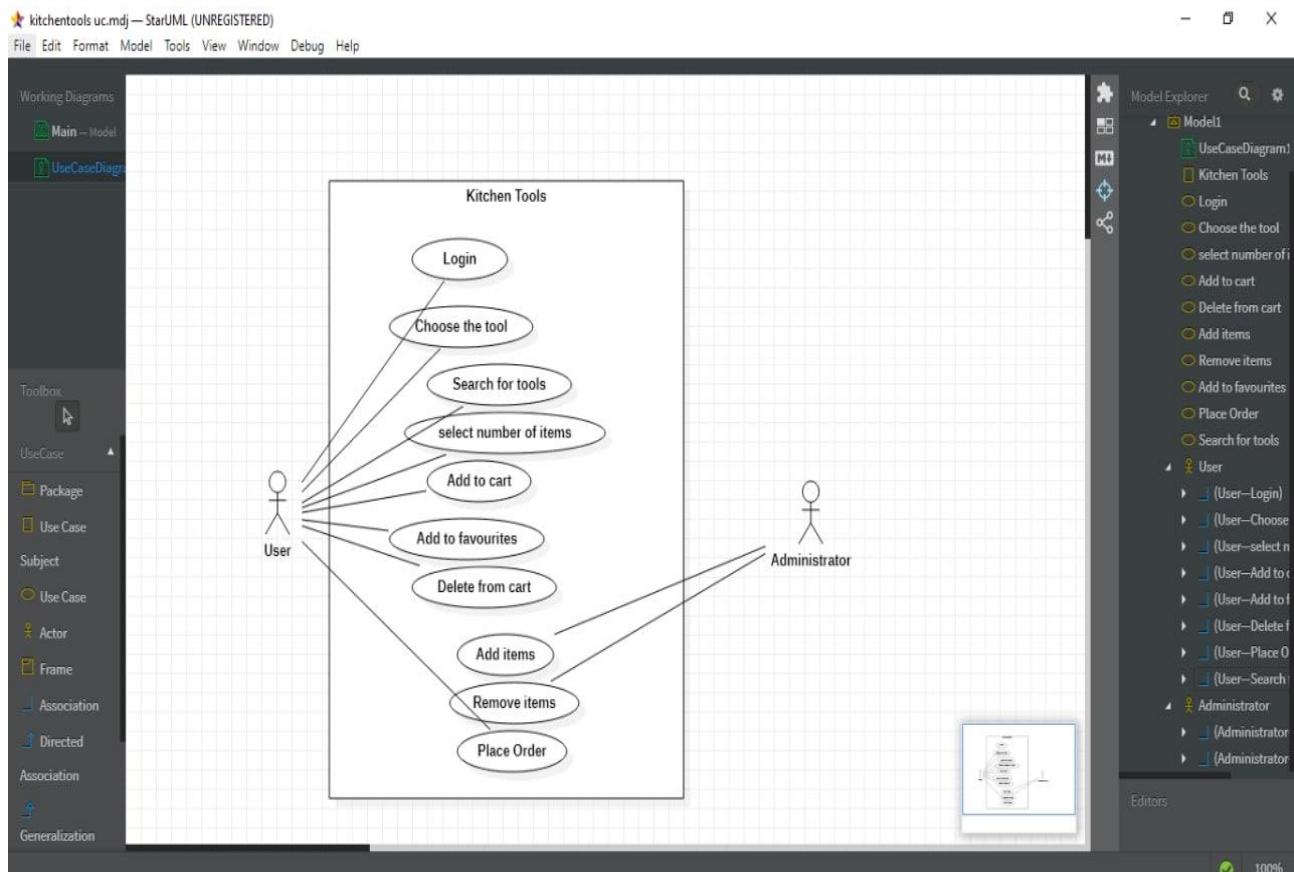
Portfolio optimization Use Case Diagram:



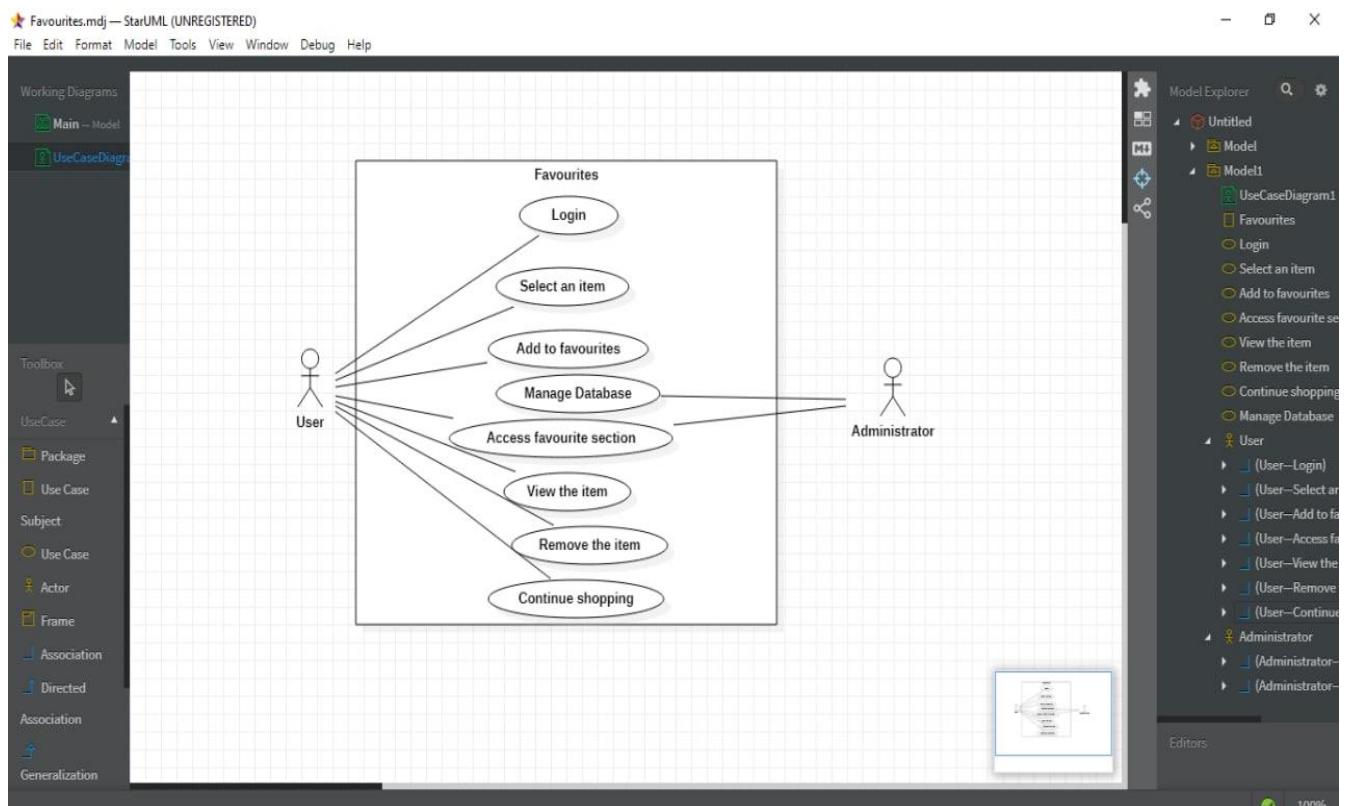
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Kitchen Tools Use Case Diagram:



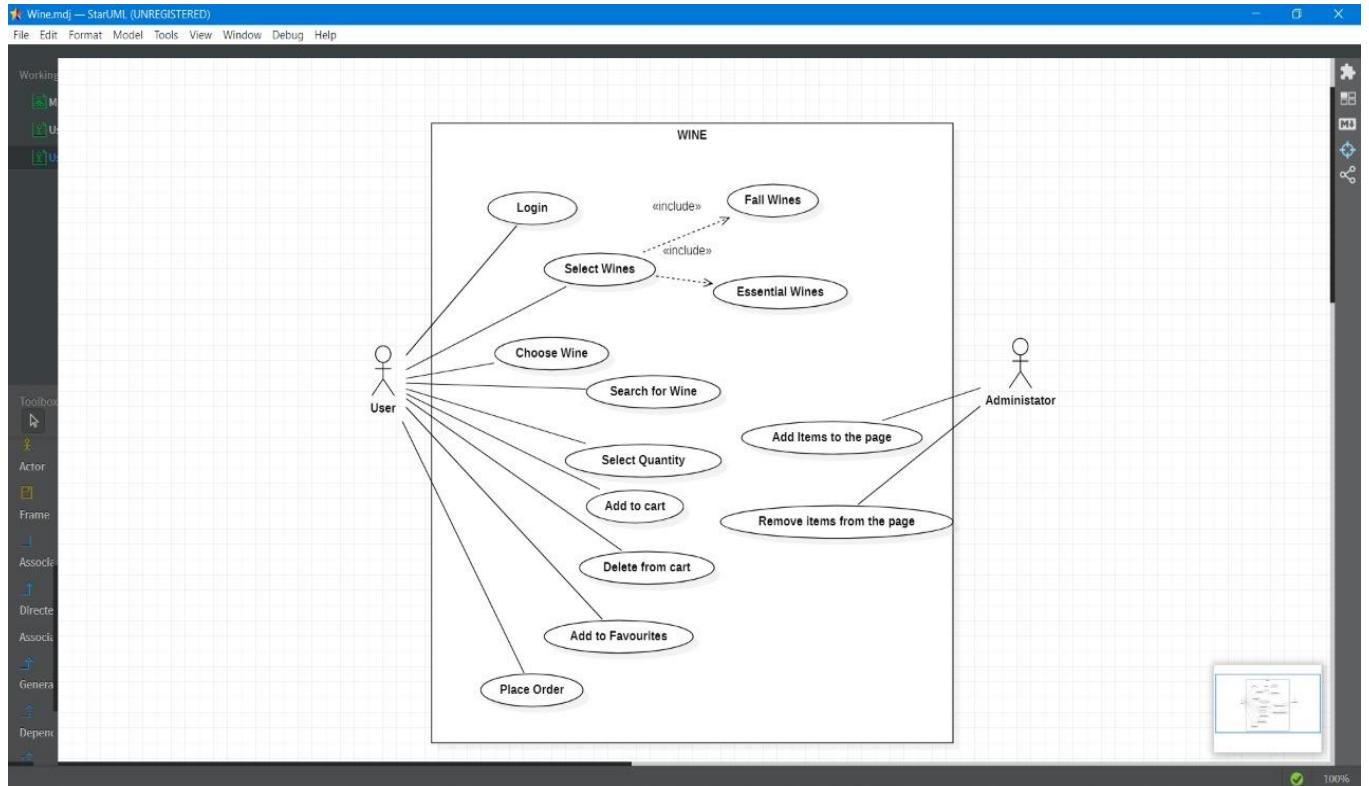
Add to Favorites Use Case Diagram:



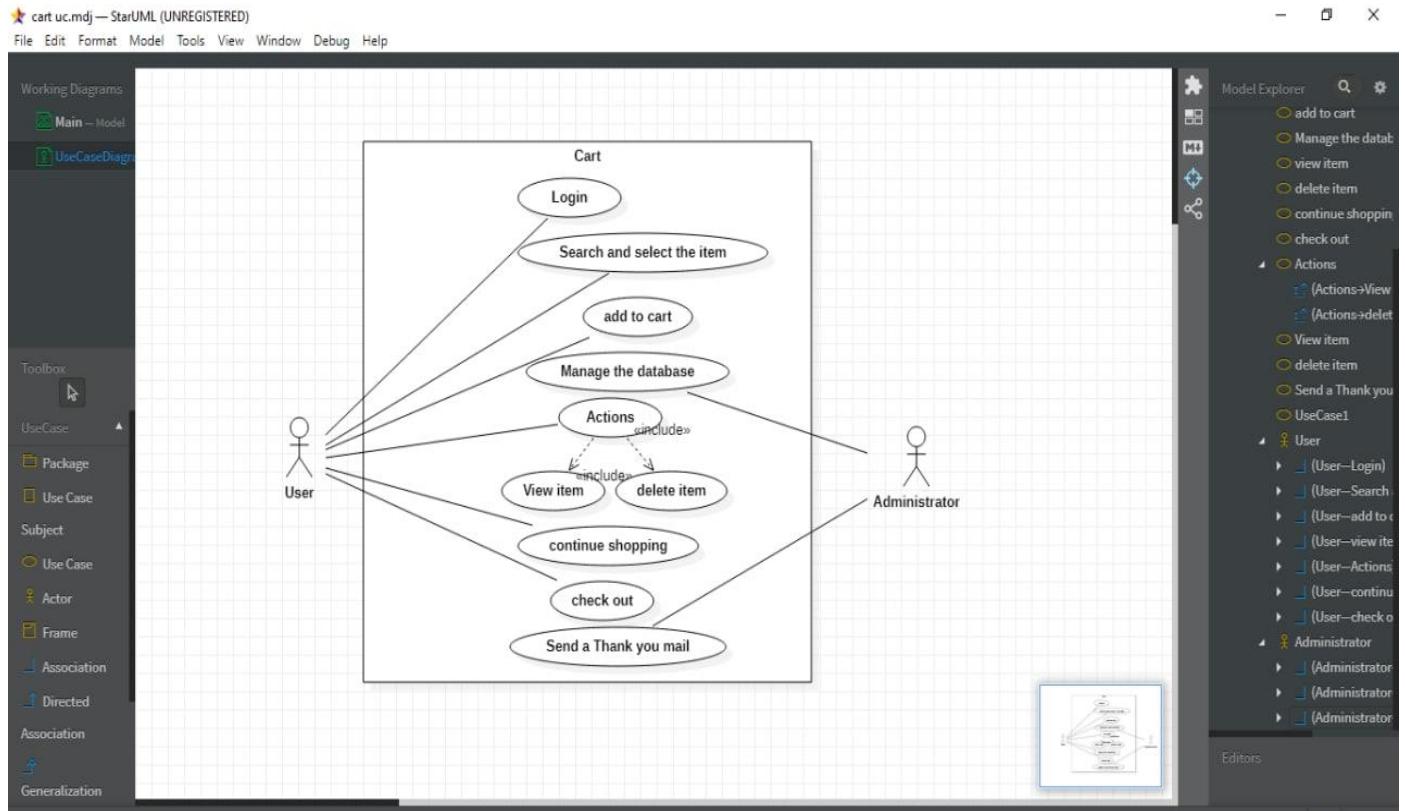
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Wine Use Case Diagram:



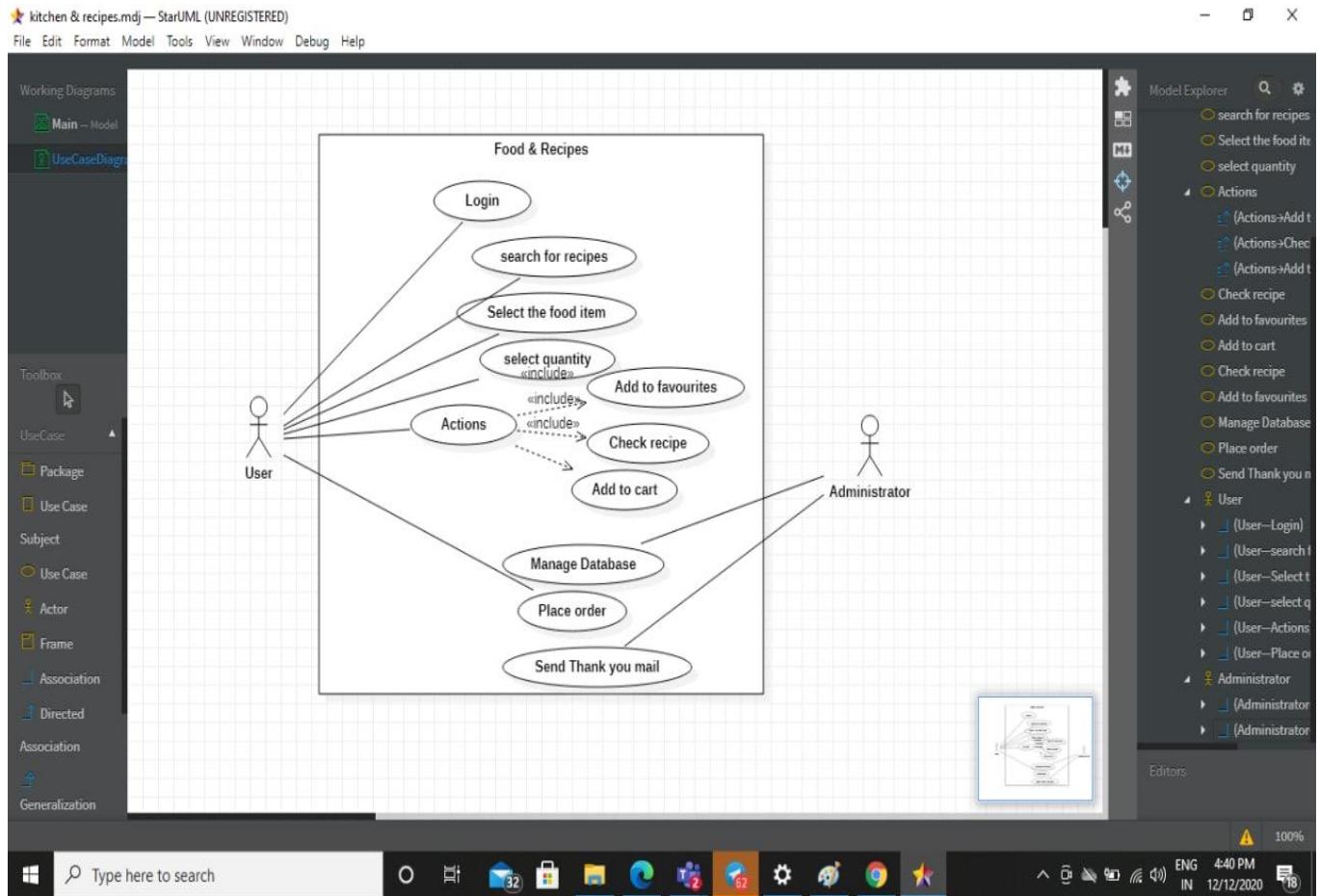
Add to Cart Use Case Diagram :



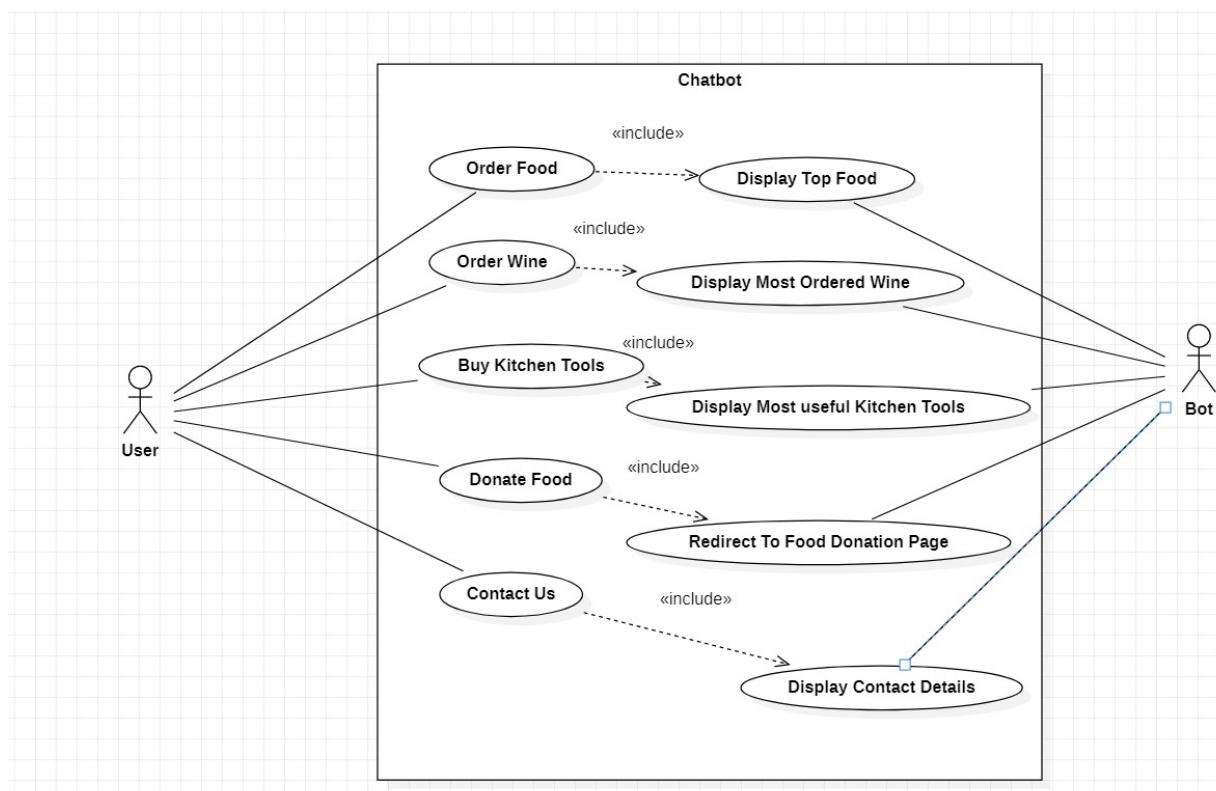
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FOOD & RECEPIES Use Case Diagram:



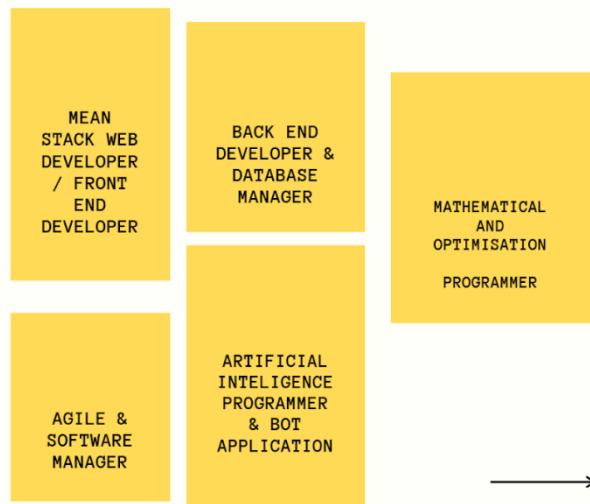
CHAT BOT Use Case Diagram:



ROUTE MAP:

- 01 Use cases/User Stories listing (7)
- 02 Gitlab/Github usage with scrum boards (17)
- 03 Daily Standups with Sprint Meetings (18)
- 04 Testing procedures adopted for whitebox testing (19).
- 05 Testing procedures adopted for blackbox testing (23)

Categories:



User Stories while developing Backend

1. As a database administrator, I need to store the user credentials, So the particular user only can log in to their accounts.
2. As a database administrator, I need to manage the info of the users, So the users can get the benefit from their data.
3. As a database administrator, I need to encrypt the data in a private server, So the user's data will be encrypted.
4. As a database administrator, I need to store the bot API token in a private server, So the bot can't be misused by others.
5. As a Database Programmer, I need to store the customer's purchases, So Customer can know his/her previous purchases.
6. As a database administrator, I need to allow the user to delete his/her own old data and allow them to update their profile with new details.
7. As a database administrator, I need to create the cart function to add the things as the user desired, So the user can add the things to the cart and continue their shopping.
8. As a database administrator, I need to store the customer queries, so that I can resolve their issue.
9. As a database administrator, I need to encrypt the user password, so that the user data is secured.

10. As a database administrator, I need to store the customer's activity securely, so that I can display the data of that particular user when he Logged in.

User Stories while developing Frontend

1. As a mean stack developer, I need to store the user credentials, So the particular user only can log in to their accounts.
2. As a mean stack developer, I need to manage the info of the users, So the users can get the benefit from their data.
3. As a mean stack developer, I need to encrypt the data in a private server, So the user's data will be encrypted.

4. As a mean stack developer, I need to store the bot API token in a private server, So the bot can't be misused by others.
5. As a mean stack Programmer, I need to store the customer's purchases, So the Customer can know his/her previous purchases.
6. As a mean stack developer, I need to allow the user to delete his/her own old data and allow them to update their profile with new details.
7. As a mean stack developer, I need to create the cart function to add the things as the user desired, So the user can add the things to the cart and continue their shopping.
8. As a mean stack developer, I need to store the customer queries, so that I can resolve their issue.
9. As a mean stack developer, I need to encrypt the user password, so that the user data is secured.

As a mean stack developer, I need to store the customer's activity securely, so that I can display the data of that particular user when he Logged in.

User Stories while developing Registration Page

1. As a customer, I need a (sign up)registration web page, so that I can create an Account.
2. As a customer, I need a login web page, So that I can login.
3. As a customer, I need a logout option, So I can quit when I complete my work in website.
4. As a web designer, I need to create a web page for sign up, So the user can create an account.
5. As a web designer, I need to create a web page for login, So the user can login.
6. As a web designer, I need to create a web page for logout, so they can logout when their work is done.
7. As a database administrator, I need to manage the info of the users, So the users can get benefit of their data.
8. As a database administrator, I need to encrypt the data in private server, So the user's data will be encrypted.
9. As a database administrator, I need to store the user credentials in tables, So the particular user only can login into their accounts.
10. As a programmer, I need to make all the customer to create a strong password, So the other person can't guess the user's password.
11. As a user, I need to know the status of my activity done in the webpage.
12. As a web designer, I need to create a notifier, So the user can know the understand the progress of the activity.
13. As a user, I need to know my activity about the dishes that have been bought by me.
14. As a web designer, I need to provide a dashboard to the user, So the user can know his/her activities in one place.

User Stories while developing Chatbot

1. As a developer, I need to create a clean and neat plan for developing a chatbot.
2. As a customer, I need a virtual assistant on the web page, so that I can get clarify my queries.
3. As a web designer, I need to create a virtual assistant i.e., the chatbot on the web page, So the customer can get help from the bot.
4. As a web designer, I need to create a good UI for the bot, So the user can utilize the bot well.
5. As a User, I would be happy if I can order food directly from chatbot itself.
6. As a User, I would be happy if I find a way to contact the Developers through the chatbot.
7. As a Developer, I need to provide basic contact details to the user to interact with us
8. As a Developer, I need to customize the chatbot as per the user's interest. So, the users will feel good when interacting with it.

9. As a Developer, I need to applaud the users who choose for Food Donation.
10. As a user, I would be happy if I can order wine directly from chatbot itself.
11. As a Developer, I need to store the bot API token in a private server, So the bot can't be misused by the others.
12. As a programmer, I need to make all the customers satisfied with the chatbot.
13. As a programmer, I need to test the chatbot with all the test cases, So it will be deployed successfully in the webpage.

User Stories while developing Kitchen Tools Section

1. As a Customer, I want to buy right appliances for my kitchen, So I can start doing the cooking.
2. As a Programmer, I want to recommend the right things for kitchen work. so Customer can buy the necessary things for kitchen work.
3. As a Web Page designer, I need to provide a Webpage to display the kitchen stuff in a sorted feature, So Customer can easily pick the right things for the kitchen work.
4. As a user, I need to know the status of my activity done in the webpage.
5. As a web designer, I need to create a notifier, So the user can know the understand the progress of the activity.
6. As a user, I need to know my activity about the dishes that have been bought by me.
7. As a web designer, I need to provide a orders page to the user, So the user can know his/her activities in one place.
8. As a user, I need to add the things in cart, So I can check out all the things at a time.
9. As a web page designer, I need to provide a web page for cart, So the user can add the things to the cart and continue their shopping.
10. As a database administrator, I need to create the cart function to add the things as the user desired, So the user can add the things to the cart and continue their Shopping.

User Stories while developing Contact Us | About Us Section

1. As a user, I need to contact the Meal mate, so that I can clear my queries by contacting them.
2. As a web designer, I need to create a web page for contact the meal mate, So the user can contact the meal mate and clear his/her queries.
3. As a user, I need to go to the meal mate's office, so that I can speak to them about the plans/some stuff.
4. As a database administrator, I need to store the customer's queries, So that the admin can give a reply to the customer's queries.
5. As a web designer, I need to provide the GEO Location in the web page to approach the meal mate's office, So the user can approach us and express his/her ideas.
6. As a user, I need to contact the meal mate through email or phone, So I can talk to them at possible time or space time.
7. As a web designer, I need to email, phone, send message field box in the web page to approach the us, So the user can talk to us directly.
8. As a user, I need to know the status of my activity done in the Webpage.
9. As a web designer, I need to create a notifier, So the user can know the understand the progress of the activity.
10. As a user, I need to know my activity about the dishes that have been bought by me.
11. As a web designer, I need to provide a orders page to the user, So the user can know his/her activities in one place.

12. As a web designer, I need to convey the description of the project and also the details of the team who worked on this project.

User Stories while developing Food Section

1. As a User, I want the good understandable page, So I no need to waste my time in searching.
2. As a Webpage designer, I want to provide a rich user interface to the webpage, So users can understand and have presentable look on the webpage.
3. As a Customer, I want good recipe(s), So I can cook food on my own.
4. As a Programmer, I want to sort/arrange the recipe(s) based on their category, So Customer can easily avail the Awesome recipe(s).
5. As a Webpage designer, I want to provide a webpage to display the recipe(s), So Customer can see them clearly.
6. As a Customer, I need to order the stuff, So I can save time instead of cooking.
7. As a Database Programmer, I need to create a database for the customer, So Customer can know his/her previous purchases.
8. As a Webpage designer, I want to provide a webpage to display their orders, So Customer can know of what they are ordering.
9. As a user, I need to know the status of my activity done in the webpage.
10. As a web designer, I need to create a notifier, So the user can know the understand the progress of the activity.
11. As a user, I need to know my activity about the dishes that have been bought by me.
12. As a web designer, I need to provide a orders page to the user, So the user can know his/her activities in one place.
13. As a user, I need to add the things in cart, So I can check out all the things at a time.
14. As a web page designer, I need to provide a web page for cart, So the user can add the things to the cart and continue their shopping.

As a database administrator, I need to create the cart function to add the things as the user desired, So the user can add the things to the cart and continue their Shopping.

User Stories while developing Profile-Cart-Search

1. As a user, I need to update my profile details in mealmate, so that I can add my new details and it will be easier to the mealmate to contact me.
2. As a web designer, I need to provide a web page to the user to update his/her own details, So It will be easier to contact the user for providing our services.
3. As a database administrator, I need to allow the user to delete the his/her own old data and allow them to update their profile with new details.
4. As a user, I need to add the things in cart, So I can checkout all the things at a time.
5. As a web page designer, I need to provide a web page for cart, So the user can add the things to the cart and continue their shopping.
6. As a database administrator, I need to create the cart function to add the things as the user desired, So the user can add the things to the cart and continue their shopping.
7. As a user, I no need to browse all the products which will consume more time, So I need a search box to search the things/products I need.
8. As a web designer, I need to provide a search box in a web page to search the products/things, So the user will consume the time by searching.
9. As a programmer, I need to create a search function, So the user can search the products/things they need.

10. As a user, I need to know the status of my activity done in the webpage.
11. As a web designer, I need to create a notifier, So the user can know the understand the progress of the activity.
12. As a user, I need to know my activity about the dishes that have been bought by me.
13. As a web designer, I need to provide a dashboard to the user, So the user can know his/her activities in one place.

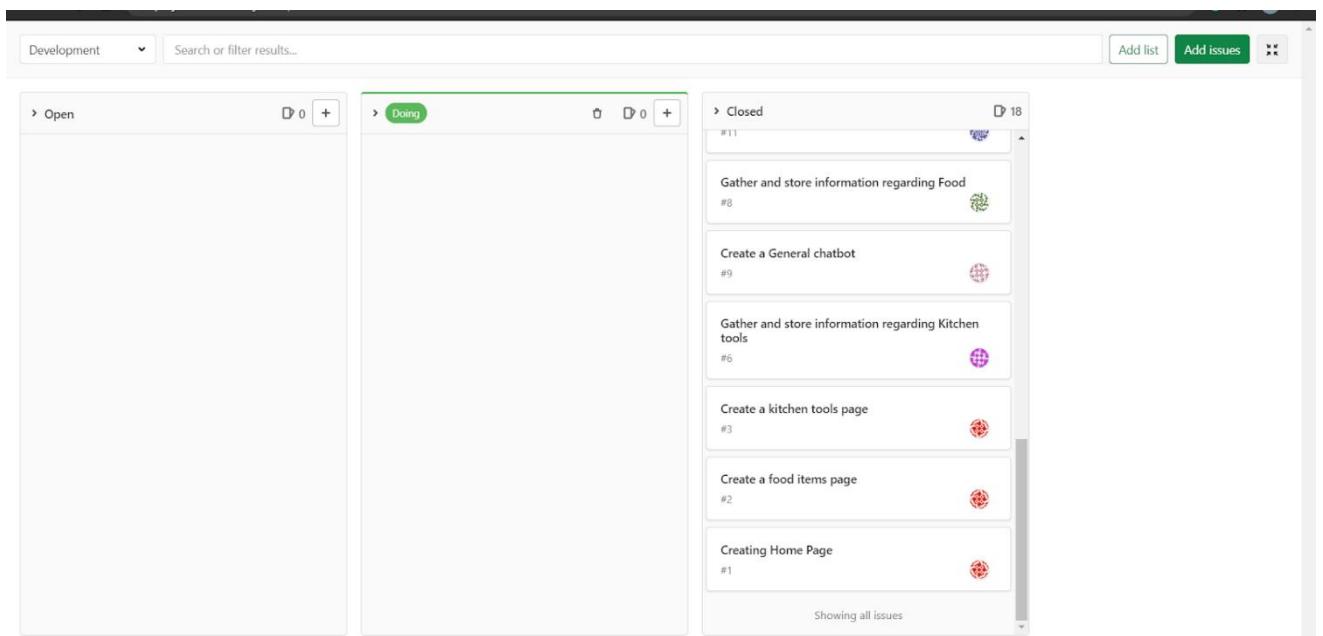
User Stories while developing Wines Section

1. As a customer, I want to know the price of wines, so that I can purchase some good wines at an affordable cost.
2. As a customer, I need the information of wines on a web page, so that I can know about the wines.
3. As a customer, I need the information of wines with details, So I can check out some good wines.
4. As a web designer, I need to create a web page for wines to display them, So the user can know about the wines.
5. As a web designer, I need to create a web page with images for every particular wine, So the user can get benefit of it.
6. As a web designer, I need to create a web page with details information of data for every particular wine, So the user can know about the wines clearly.
7. As a database administrator, I need to manage the info of the users, So the users can get the benefit of their data.
8. As a database administrator, I need to encrypt the data in a private server, So the user's data will be encrypted.
9. As a database administrator, I need to store the user credentials in tables, So the particular user only can log in into their accounts.
10. As a programmer, I need to provide Affordable price for the wine. So that the customer can avail the profit
11. As a user, I need to know the status of my activity done in the webpage.
12. As a web designer, I need to create a notifier, So the user can know the understand the progress of the Activity.
13. As a user, I need to know my activity about the dishes that have been bought by me.
14. As a web designer, I need to provide a dashboard to the user, So the user can know his/her activities in one place.

Optimization Module USER STORY

1. As a programmer, I need to optimize the cost of the recipes we are selling, So the web master would get an optimal profit.
2. As a user, I would like it if the cost of the recipes would be reasonable and optimal.
3. As a web designer, I need to create a search bar using a search algorithm, so the customer would find it easy to find their desired product.
4. As a user, I would like it if there was an easy way to search for the desired product instead of searching the whole website.

GitHub usage with scrum boards



SPRINT MEETINGS:

The image shows a list of sprints in a project management interface:

- Sprint 6**: Nov 16, 2020–Nov 29, 2020 | 5 Issues - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint 5**: Oct 2, 2020–Nov 15, 2020 | 2 Issues - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint 4**: Oct 19, 2020–Nov 1, 2020 | 1 Issue - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint 3**: Oct 5, 2020–Oct 18, 2020 | 4 Issues - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint 2**: Sep 21, 2020–Oct 4, 2020 | 2 Issues - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint 1**: Sep 7, 2020–Sep 20, 2020 | 3 Issues - 0 Merge Requests | 100% complete | Reopen Milestone
- Sprint Planning**: (No details shown)

Black Box Testing:

- The software program or system under test, is viewed as a “black box”.
- It is the kind of testing based on the requirements and specifications.
- This can be applied to every level of software testing such as Unit, Integration, System and Acceptance Testing.
- There is no need in examining the code in black box testing.
- It is purely done based on customers view point only.

- The tester knows the set of inputs and predictable outputs. It is done based on end user perspective.
- The programmers and testers are independent of each other. Black box testing is done on the completely finished product.

Various parameters checked in Black Box Testing are:

- Accurate actions performed by users
- System's interaction with the inputs
- The response time of the system
- Use of data structures Issues in the user interface
- Usability issues
- Performance issues
- Abrupt application failure, unable to start or finish

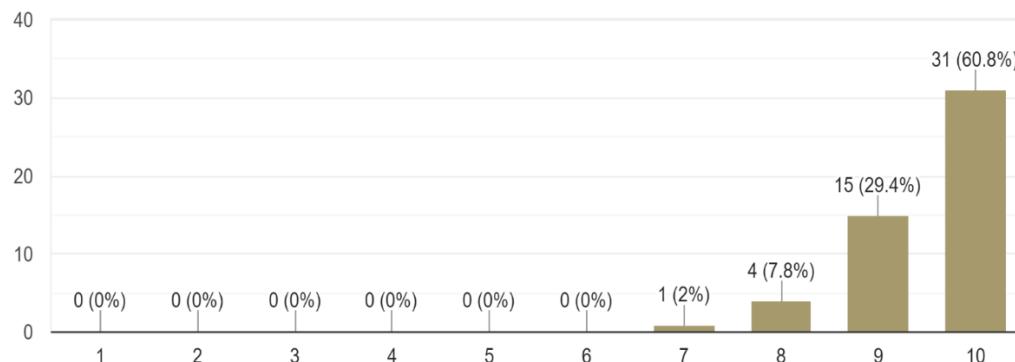
When do we do Black Box Testing?

- Unlike traditional white box testing, black box testing is beneficial for testing software usability.
- The overall functionality of the system under test
- Black box testing gives you a broader picture of the software.
- This testing approach sees an application from a user's perspective.
- To test the software as a whole system rather than different modules.

We have conducted a survey on to check the above parameters and here are the results:

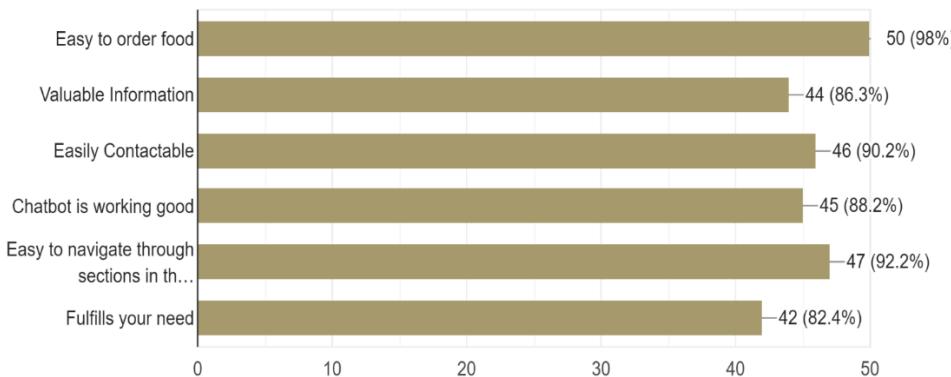
Overall rating of the "MealMate" website

51 responses



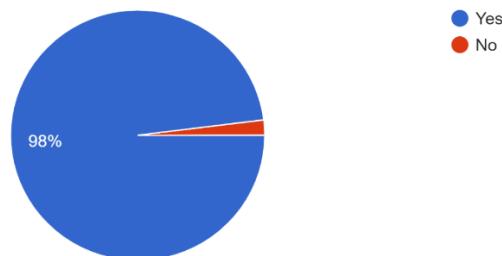
Check the following that applies, according to the "Mealmate" website:

51 responses



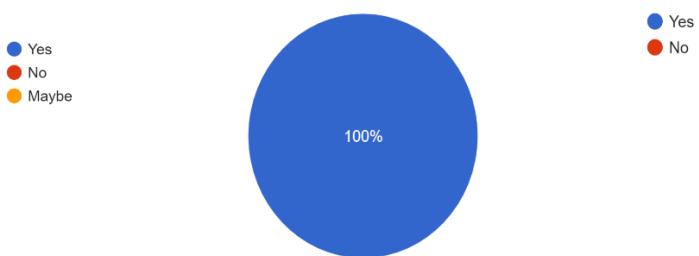
Are you able to login/register successfully on the site?

51 responses



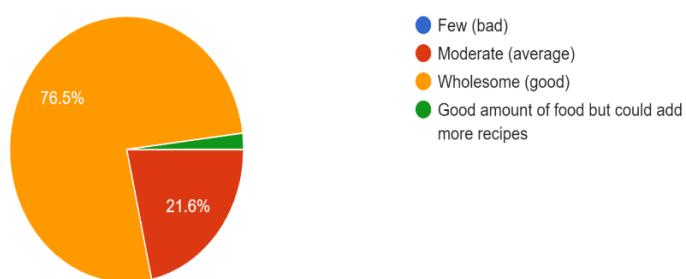
Does the website provide all the required information you need?

51 responses



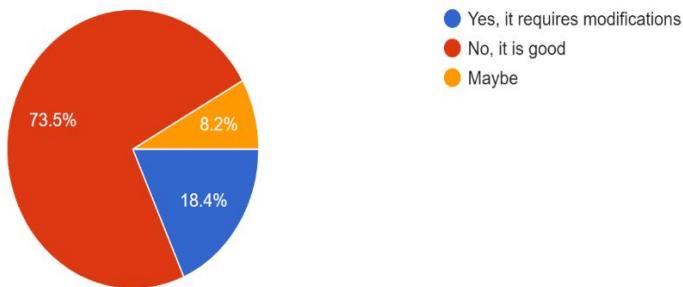
Food Options:

51 responses



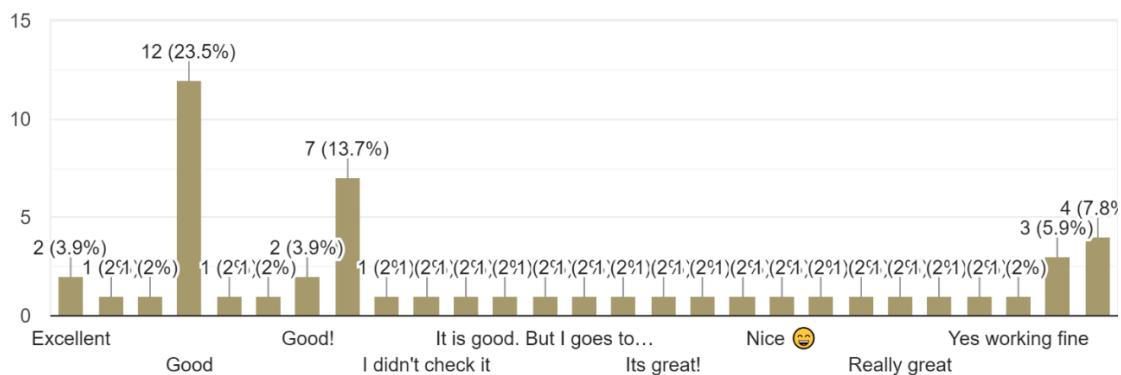
How do you like the "Food Donation Form"? Do you think it requires any modifications?

49 responses



How is the chatbot working?

51 responses



White Box Testing:

- **White box testing** refers to a scenario where (as opposed to **black box testing**), the tester deeply understands the inner workings of the system or system component being tested.
- Gaining a deep understanding of the system or component is possible when the tester understands these at program- or code-level.
- Tester will be able to design and execute test cases that cover all possible scenarios and conditions that the system component is designed to handle.
- By performing testing at the most granular level of the system, we are able to build a robust system that works exactly as expected, and ensure it will not go wrong in any way.

Key Principles:

- Statement Coverage – ensure every single line of code is tested.
- Branch Coverage – ensure every branch (e.g. true or false) is tested.
- Path Coverage – ensure all possible paths are tested.

When do we do White Box Testing?

- White box Testing is usually reserved for **mission critical systems** (Example: Core Banking System for safe & secure transactions or account maintenance) and components, because, well, such systems simply deserve the attention to detail that this technique can bring.
- The rigor that white box Testing employs is quite useful – yes, but not all the time.

Steps to follow for White Box Testing:

Step 1: Identify the feature, component, program to be tested

Step 2: Plot all possible paths in a flowgraph using:

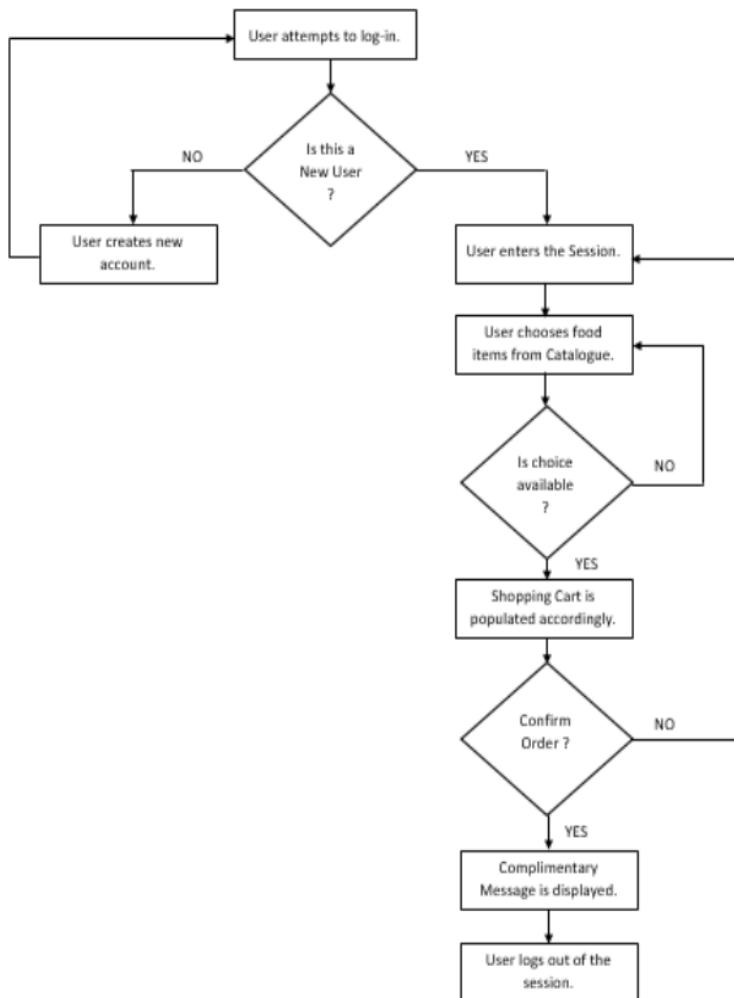
- User journeys, use cases
- Program specifications
- Technical specifications, pseudocode

Step 3: Identify all possible paths from the flowgraph

Step 4: Write Test Cases to cover every single path on the flowgraph

Step 5: Execute, rinse, repeat.

FLOWCHART:



SPRINT MEETINGS:

MealMate

MealMate is based on "E-Commerce Systems". By this web app, we provide delicious food items to the customers with not only providing them the provision to order their choice of food but also, MealMate provides all the necessary information and recipes to cook the desired food by the customers. With its update, to food ordering's, MealMate also supplies kitchen tools and beverages to the customers.

ContactUs

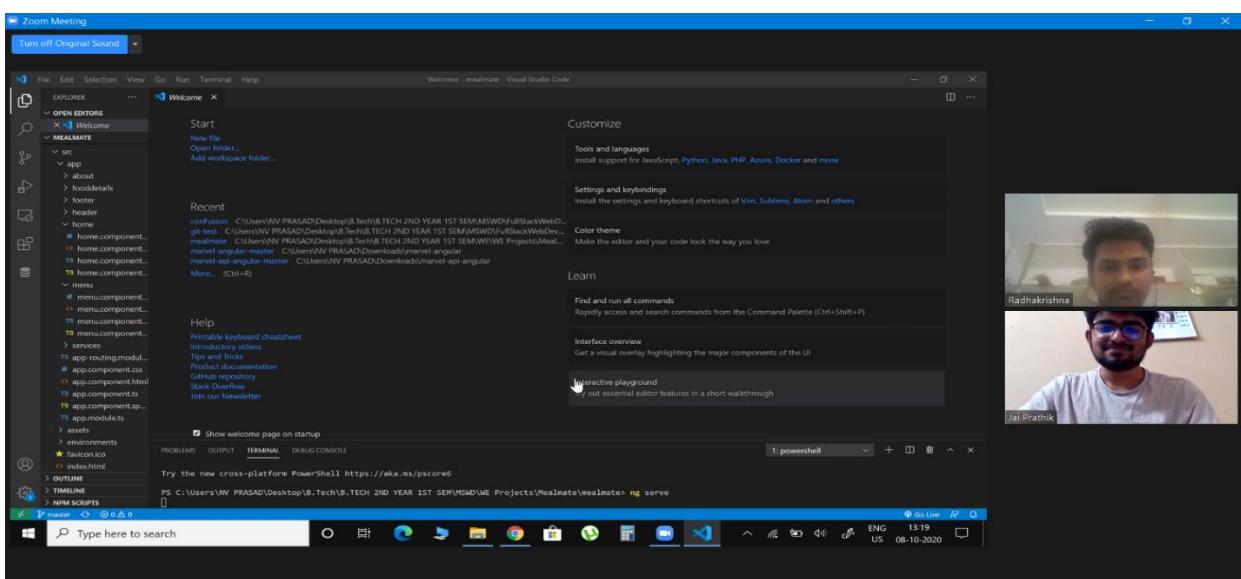
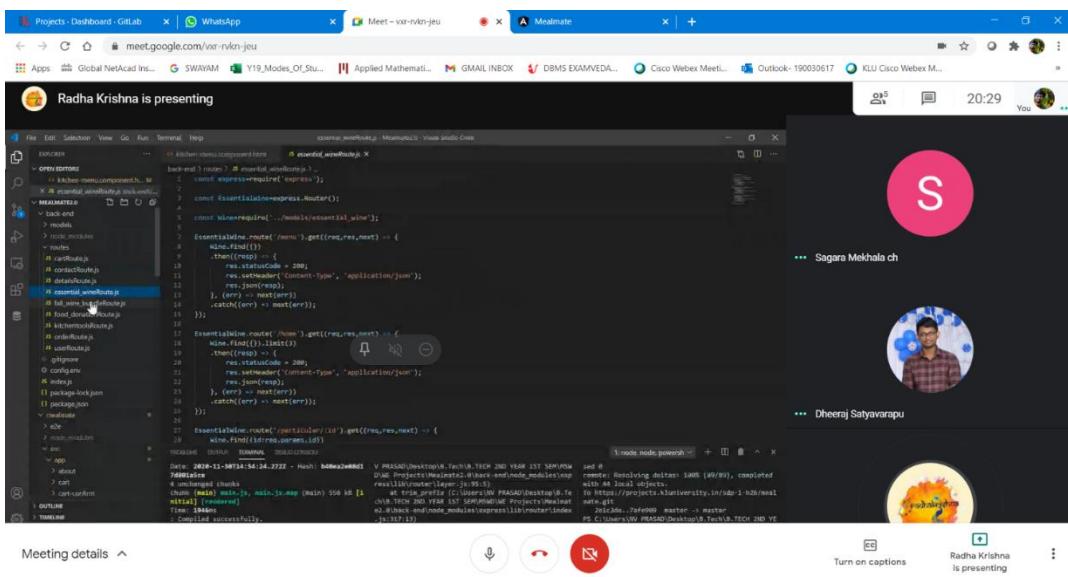
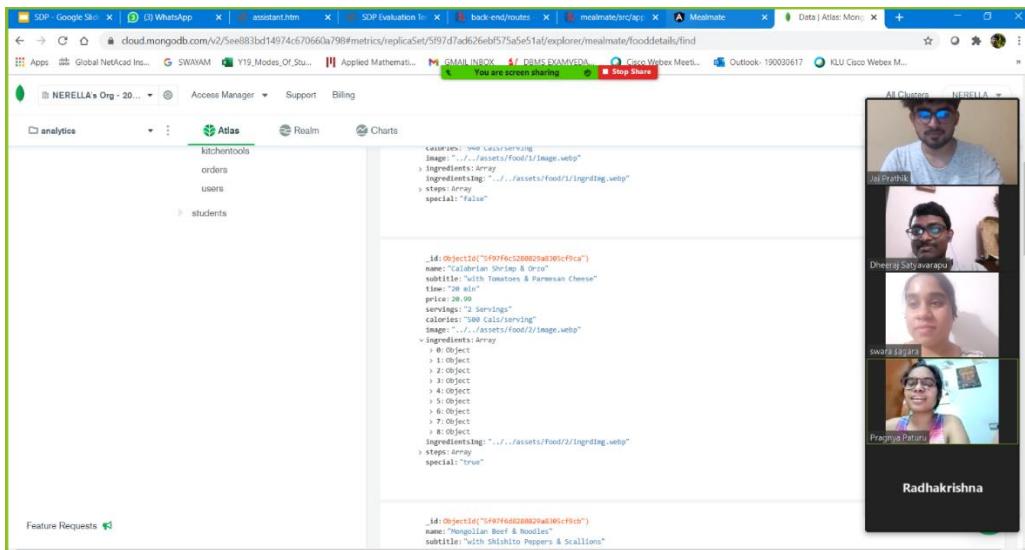
LEPL, Centro Mall, 3rd Floor
Opp CPR Hotel Fortune, Murali Park, MG Rd
Labbipet, Vijayawada
Andhra Pradesh, 520010
India

mealmate.sdp26@gmail.com

Y19 - SDP-1 EVALUATION RUBRIC								
Sl No	Relevant Course	Evaluation Components	0	2	4	6	8	10
1	SE	Use cases/User Stories listing						
2		Gitlab/Github usage with scrum boards						
3		Daily Standups with Sprint Meetings						
4		Testing procedures adopted for whitebox testing						
5		Testing procedures adopted for blackbox testing						
6	DBMS	Logical Modelling of data						
7		Physical Modelling of data						
8		Data Querying						
9		Usage of indeces and triggers						
10		Testing of the Normalised tables with SQL Queries						
11		Use of MongoDB against MySQL for Unstructured data						
12	AI	Inclusion of intelligence driven user stories in the project						
13		Algorithmic implementation of the intelligence component in the design phase						

SKILL DEVELOPMENT PROJECT-1

BATCH 26



MP-1**How Mathematical Programming is useful for e-commerce?**

- MP is most useful concept for e-commerce more than any other business domains we can see so far.
- E-commerce has been rising ever since the **large-scale optimization** has been introduced into it.
- Optimization is collection of mathematical principles and methods used for solving quantitative problems. In layman's words we can say that we use optimization for finding the minimum or maximum of a function or **profits** as we can say for e-commerce domain.
- We basically use this concept for Automatic pricing, customer behavior analysis, crew scheduling, supply chain management etc.
- In e-commerce we have to stress on the point of **optimizing the amount** we get from our customers or what we spend on the goods, employees or any other requirements. Here we will have to find the **maximum profit** we would get from our customers and **minimize** the spending cost. This would be an example for **AUTOMATICPRICING**
- **Software and method used for the project:**
- **Solvers:** We have number of solvers available for the optimization of our functions. These solvers may vary in the algorithms for solving
- The main component of optimization for an e-commerce website is **PRICING** of the product we are selling. The cost of the product must be in such a way that it would provide an optimal profit and also the consumer price considering all the pricing aspects from the making of the product to delivering it to the consumer.
- We used the method of **PORTFOLIO OPTIMIZATION** which is the process of selecting the best portfolio (asset distribution), out of the set of all portfolios being considered, according to some objective. The objective typically maximizes factors such as expected return, and minimizes costs like financial risk. Factors being considered may range from tangible (such as assets, liabilities, earnings or other fundamentals) to intangible (such as selective divestment).
- The portfolio optimization problem is specified as a constrained utility-maximization problem. Common formulations of portfolio utility functions define it as the expected portfolio return (net of transaction and financing costs) minus a cost of risk.
- We do this process in MS Excel.

Algorithm implementation of the optimization component in the design phase:**Introduction:**

Our project **THE MEALMATE** is an e-commerce website which delivers original, step-by-step recipes and fresh ingredients to customers. Each delivery you learn to cook inventive new dishes with seasonal ingredients. By letting us source these hard-to-find ingredients for you, you'll get food that is fresher and cheaper than you can get at your local supermarket, and there's no waste because we only send you what you need for each recipe.

So, the main component of optimization for an e-commerce website is **PRICING** of the product we are selling. The cost of the product must be in such a way that it would provide an optimal profit and also the consumer price considering all the pricing aspects from the making of the product to delivering it to the consumer.

1. Below is the complete algorithm including all the steps taken to optimize our prices:

ALGORITHM:

STEP 1: Form two different types of sheets in an excel for implementation of the unit test cases of every recipe.

STEP 2: Give two different names to the sheets being:

RECIPE COST CALCULATION SHEET:

STEP 2.1: Put the recipe name as the heading and start the optimized cost calculation.

STEP 2.2: Put up columns named

- Ingredient
- Total purchase quantity
- Cost of each ingredient
- Quantity needed for each recipe

STEP 2.3: FOR CALCULATING cost of each ingredient

Here, We use the concept of linear programming by considering the all the ingredients a constraints. We need to calculate the cost for each ingredient.

So, we use the formula:

$$(\text{Quantity needed for recipe(g)}) / (\text{Purchase quantity} * \text{cost of the ingredient})$$

STEP 2.4: FOR CALCULATING Total optimized cost of the recipe by adding up all the constraints.

$$\text{Total} = \text{sum(all calculated cost of the ingredient)}$$

STEP 2.5: FOR CALCULATING according to the number of servings:

$$\text{Servings} = \text{Total}/n$$

Here, n is the number of servings the customer asks for.

STEP 2.6: FOR CALCULATING cost per 10

$$\text{Cost per 10} = \text{Total} * 10$$

STEP 3: Whenever a new recipe is added the step 2 repeats on whole.

STEP 4: Now, after making the recipe cost sheets, we make the **PROFIT MARGIN AND FINAL COAST SHEET** for optimized final maximum profit ad optimized cost of all the recipes.

STEP 4.1: Put up columns named

- Menu item
- Quantity sold
- Food cost
- Menu price
- Food cost percentage
- Profit margin

STEP 4.2: The quantity sold column is filled by the number of dishes sold.

STEP 4.3: Get the food cost from the “total” constrain in the recipe cost sheet.

STEP 4.4: Set up the menu price by adding revenue of 18% as GST and also add the shipping charges.

$$\text{Menu Price} = \text{Food cost} + 18\% \text{ gst} + \text{shipping charges}$$

STEP 4.5: CALCULATING FOOD COST PERCENTAGE:

$$\text{Food cost percentage} = \text{Food cost/revenue cost}(18\% \text{ GST})$$

STEP 4.6: CALCULATING THE OPTIMIZED PROFIT MARGIN:

Profit margin gauges the degree to which a company or a business activity makes money, essentially by dividing income by revenues. Expressed as a percentage, **profit margin** indicates how many cents of **profit** has been generated for each dollar of sale.

$$\text{Profit margin} = (\text{Menu price} * \text{Quantity sold}) - (\text{Quantity sold} * \text{Menu price} * \text{Food cost percentage})$$

STEP 5: Repeat the STEP 4 for each new recipe which is added.

STEP 6: By the above overall process the **OPTIMIZED PRICE** of the recipe id obtained.

STEP 7: Now according to whatever price obtained, we implement the price seen by the website users.

OBJECTIVE FUNCTIONS FOR EACH RECIPE:

Calabrian Shrimp & Orzo

$$R1 = 253a + 113b + 2c + d + 1.5e + 2f + g + 0.25h + 113i$$

Dijon & Panko-Crusted Lamb Chops

$$R2 = 453a + 6b + 340c + d + 2e + f + g + 0.25h + i + 0.33j + 0.7k + 2l + m$$

Mongolian Beef & Noodles

$$R3 = 226a + 110b + 170c + 2d + 2e + f + g + 0.25h + i + 20j + 2k + 85l + 0.25m$$

Honey Mustard Baked Chicken

$$R4 = 2a + 340b + 50c + 2d + 0.25e + 0.25f + g + h + 29i + 2j + 100k + 1$$
Hot Italian Pork Sausage & Brussels Sprouts

$$R5 = 283a + 226b + 113c + d + e + 2f + 2g + 0.25h$$
Fontina & Sourdough Grilled Cheese

$$R6 = 200a + 24b + 120c + 30d + 30e + 250f + 120g + 100h + 50i$$
Pork Chops & Maple-Sage Pan Sauce

$$R7 = 200a + 1b + 113c + 141d + 1e + 1f + 1.5g + 1h$$
Spaghetti Squash, Pepper & Carrot Shakshuka

$$R8 = 2a + 226b + 20c + 2d + 170e + 2f + 0.25g + 42h + 1i + 14j + 1k + 1l$$
Spicy Ginger Chicken Tacos

$$R9 = 285a + 4b + 226c + 340d + 1e + 1f + 1g + 2h + 0.5i + 2j$$
Smoky Seared Cod

$$R10 = 2a + 56.7b + 1c + 2d + 340e + 2f + 28.35g + 1h + 2i + 1j + 10k + 5l + 30m$$
2. Algorithm implementation for the SEARCH BAR in the design phase:

In our project we implemented the search bar in the “food recipes”, “kitchen tools” and “wines” sections. If the customer wants to order food of their choice or buy a kitchen tool or find their favouritewine, he/she can type the name and get the result if the product is available or not. This search bar uses the following algorithm:

The type script for this is:

```
Search(){
  if(this.name != ""){
    this.filterList = this.productsList.filter(res=>{
      return res.name.toLocaleLowerCase().match(this.name.toLocaleLowerCase());
    });
    this.OnChange();
  }
  else if(this.name == ""){
    this.ngOnInit();
  }
}
```

Here the **ALGORITHM** goes as,

STEP 1: If the filter list i.e the name typed by the costumer is equal to a name present in the Product list then

STEP 1.1: Match the lower case alphabets and the uppercase

STEP 1.2: Return the product as the result.

STEP 2: If a costumer type “k” everything optimally related to k, irrelevant of the case, is shown as the result.

For example: Typing “k” turns out the optimal results related to

- Knives

Typing Italian wines would give out the wines present as result.

STEP 3: Else if the product is not found after the name typed by the customer then it returns an empty screen which is the null value.

STEP 4: Else it returns all the products available in the website as a result.

STEP 5: By following the above four steps the customers can navigate the necessary product.

Testing of Algorithms Using Unit Test Cases:

1. For Optimal Price Calculation: Calculation of individual optimized recipe cost with ingredients as constraints:

Recipe 1:

FOODSERVICE INCOME STATEMENTS					
Recipe Cost					
Calabrian Shrimp & Orzo					
Ingredient	Purchase Quantity (g)	Cost	Quantity Needed For The Recipe (g)	Calculated Cost Of the Ingredient	Making 1 Recipe
Tail-On Shrimp (Peeled & Deveined)	600	50.00	253	21.08333333	253
orzo pasta	24	20.00	113	94.16666667	113
garlic	120	5.00	2	0.083333333	2
lemon	1000	2.50	1	0.0025	1
mixed spice	30	2.00	1.5	0.1	1.5
calabrian chile paste	250	30.00	2	0.24	2
Crème Fraîche	120	30.00	1	0.25	1
capers	500	20.00	0.25	0.01	0.25
grated parmesan cheese	500	30.00	113	6.78	113
			Total	122.7158333	
			Serve	122.7158333	
			Cost 10 Recipe	1227.158333	

Recipe 2:

FOODSERVICE INCOME STATEMENTS					
Recipe Cost					
Pork Chops & Maple-Sage Pan Sauce					
Ingredient	Purchase Quantity (g)	Cost	Quantity Needed For The Recipe (g)	Calculated Cost Of the Ingredient	Making 10 Recipes
Boneless, Center-Cut Pork Chops	600	40.00	200	13.33333333	200
Apple	24	10.00	1	0.41666667	1
Brussels Sprouts	120	10.00	113	9.41666667	113
Carrots	30	5.00	141	23.5	141
Sage	30	10.00	1	0.333333333	1
Delicata squash	250	5.00	1	0.02	1
Maple syrup	120	20.00	1.5	0.25	1.5
Dijon Mustard	100	10.00	1	0.1	1
			Total	47.37	
			Serve	47.37	
			Cost 10 Re	473.7	

Calculation of the optimized PROFIT MARGIN and FINAL COST:

1	Profit Calculation										
2	Menu Item	QTY SOLD	FOOD COST	MENU PRICE	FOOD COST PERCENTAGE	PROFIT MARGIN					
3	Dijon & Panko-Crusted Lamb Chops	1	84	90	30%	63					
4	Calabrian Shrimp & Orzo	1	122.00	125	25%	93.75					
5	Mongolian beef and noodles	1	88	95	30%	66.5					
6	Honey Mustard baked chicken	1	151	130	40%	78					
7	Hot Italian Pork sausage & brussel sprouts	1	122	125	30%	87.5					
8	Fontina & sourdough grilled cheese	1	32	40	30%	28					
9	Pork chops & Maple-Sage Pan Sauce	1	47	55	25%	41.25					
10	Spaghetti Squash, Pepper & carrot slaw	1	154	140	40%	84					
11	Spicy ginger chicken Tacos	1	70	75	20%	60					
12	Smokey seared cod	1	72.5	75	20%	60					
13											
14											
15											

Implementing the algorithms in the website (design phase):
Display of the cost in main food & recipes page:


Cart
Logout

FOOD & RECIPES



Dijon & Panko-Crusted Lamb Chops
with Salsa Verde Carrots & Garlicky Purple Potatoes
Price: ₹90.00/SERVING
55 min



Calabrian Shrimp & Orzo
with Tomatoes & Parmesan Cheese
Price: ₹125.00/SERVING
20 min



Mongolian Beef & Noodles
with Shishito Peppers & Scallions
Price: ₹95.00/SERVING
25 min

Cost of one single recipe name “Dijon & Panko-Crusted Lamb Chops“:

Dijon & Panko-Crusted Lamb Chops
with Salsa Verde Carrots & Garlicky Purple Potatoes

Price: ₹90.00/SERVING

🕒 55 min
🍴 2 Servings
🍎 940 Cals/serving

- 1 + [Add To Cart](#)



fresh INGREDIENTS

Ingredients screenshot (constraints):

fresh INGREDIENTS



QTY	INGREDIENTS
1	Frenched Rack Of Lamb
6 oz	Carrots
3/4 lb	Purple Potatoes
1	Lemon
2 cloves	Garlic
1 bunch	Thyme
1 bunch	Oregano
1/4 cup	Panko Breadcrumbs
1 Tbsp	Dijon Mustard
1/3 cup	Salsa Verde
0.7 oz	Grana Padano Cheese
2 Tbsps	Crème Fraîche
1 oz	Castelvetrano Olives

2. For SEARCH BAR (Search algorithm):

We use the SEARCH BAR at 3 places in our project:

A) For Food & Recipes:

Food & Recipes

Honey Mustard Baked Chicken
with Smoky Smashed Potatoes
Price: ₹130.00/SERVING
🕒 40 min

Spicy Ginger Chicken Tacos
with Curry-Roasted Potatoes
Price: ₹75.00/SERVING
🕒 30 min

B) For Kitchen Tools:

KITCHEN TOOLS

The Blue Apron
Price: ₹50.00

C) For Wines:

FALL WINES

Holiday Potluck Pack
Price: ₹50.00/SERVING

Holiday Feast Favorites
Price: ₹110.00/SERVING

DBMS

Every organization is now trying to have hands on experience in regard with DBMS to remain competitive in their respective fields. Every organization which is big or at its starting stage wants to have their own DBMS as they don't want themselves to be left behind. To function in an e-business environment, an organization has to have a good command of knowledge on its markets, customers, products and services, methods and processes, competitors, employee skills and its regulatory environment.

The term E-business is used in two main ways within organizations.

1. The first is as a concept which can be applied to strategy and operations.

2. Secondly E-business is used as an adjective to describe businesses that mainly operate online, i.e. they have no physical presence on the high-streets and seek to minimize customer-service and support through enabling 'web self-service'.

Every day some or the other organization is building database application or re-constructing the older version, for making these applications there are two ways; Microsoft products such as .net platform or Visual BASIC with an Open Database Connectivity (ODBC) driver connected to SQL Server & the other is JSP/Java Server with a JDBC driver in DBMSs such as Oracle or IBM DB2 on the Unix, Linux and Windows platforms.

The main purpose to a database is to store information. Have a question about a customer order? Check the database. Want to know a product price? Check the database.

By using a database, a web application can ignore the actual data and focus more on the presentation and behavior of that data. The end result is that the amount of code and logic in the web application is much smaller and easier to understand.

The root purposes would be like:

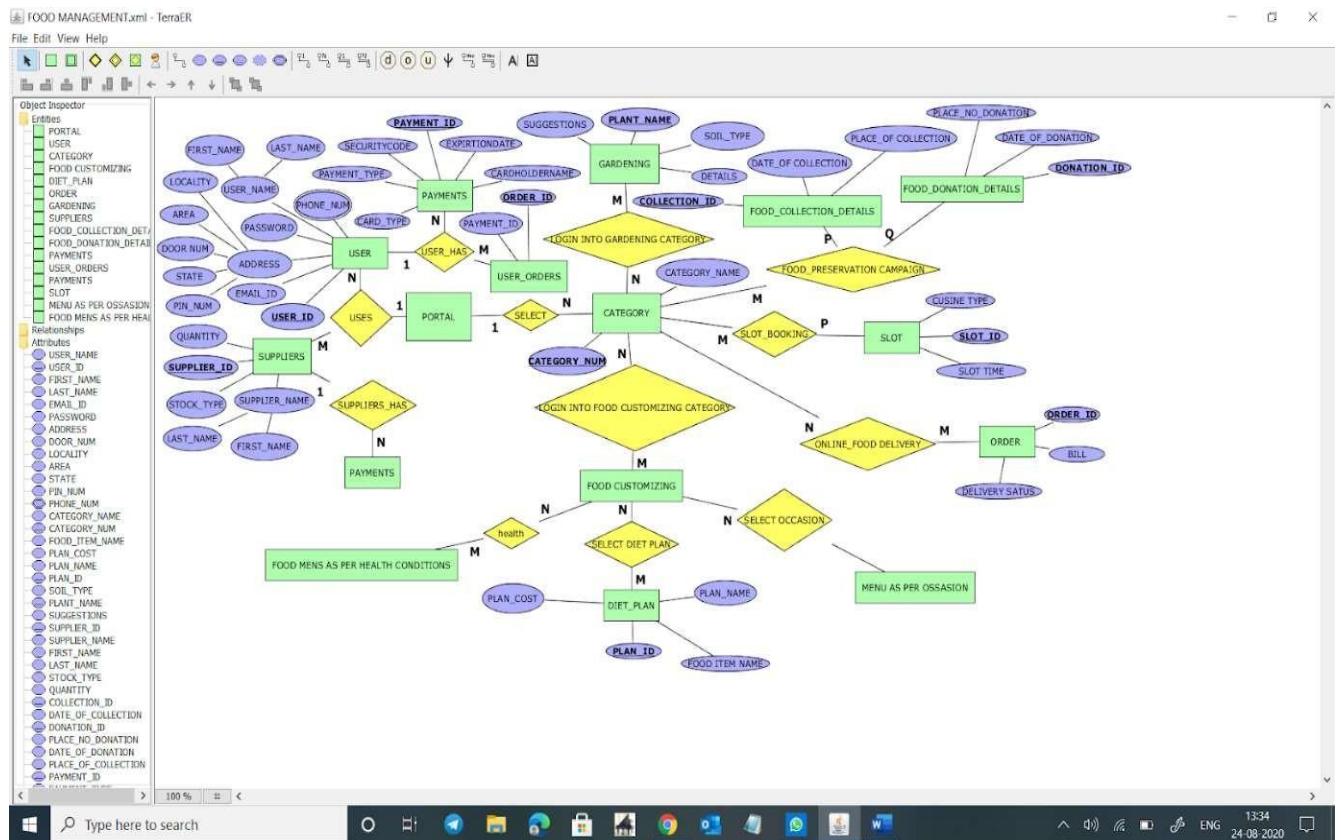
Track transactions: One of the most important jobs of the database is to track and manage transactions. It needs to keep track of every order along with the details that your company needs to process the transaction. There is much data needed to process an order. This functionality dominates most ecommerce databases.

It's common to see databases with millions and billions of separate data entries just to support order transactions alone.

Organize products: Another important database function is organizing products. Depending on the store, there could be millions of products, each with different variants and styles. Organizing this mix of products and options is a critical function of an ecommerce database.

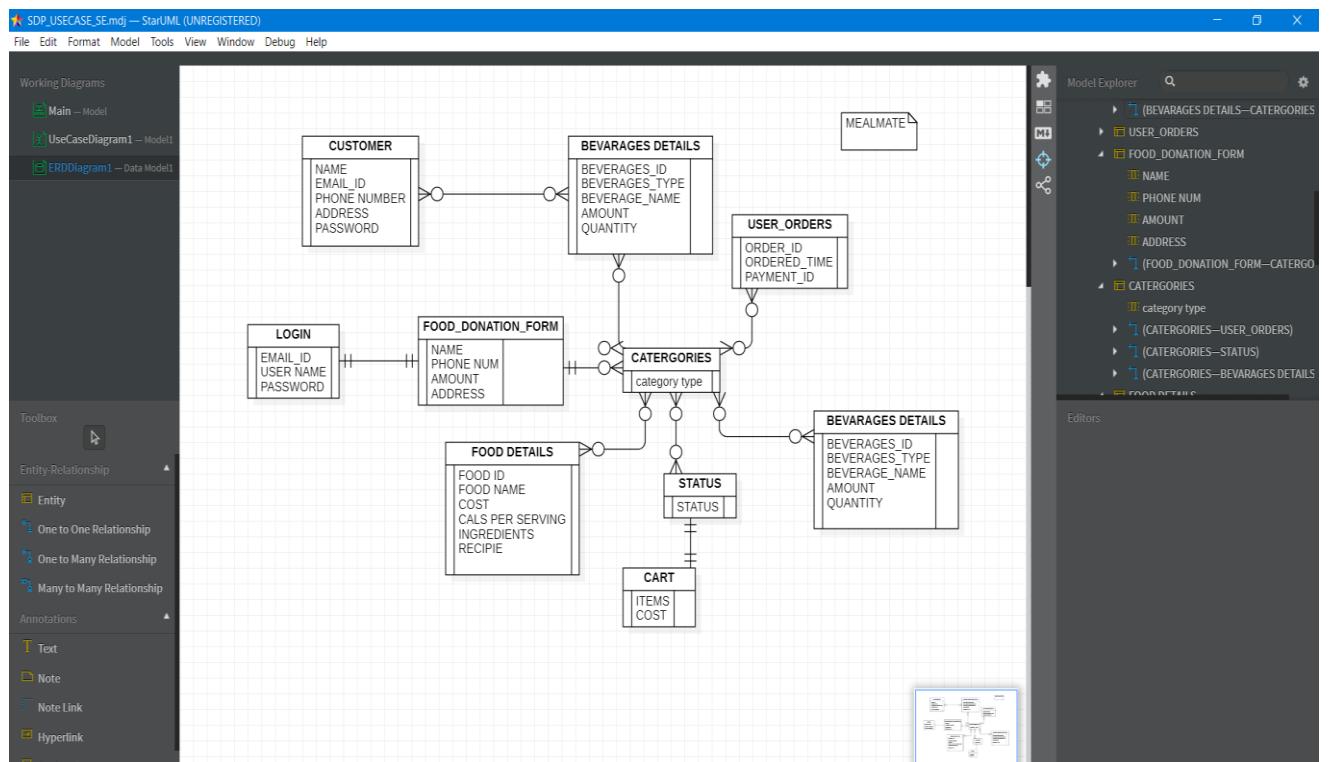
Physical Modelling of Data:

Physical schema is a term used in data management to describe how data is to be represented and stored (files, indices, et al.) in secondary storage using a particular database management system (DBMS) (e.g., Oracle RDBMS, Sybase SQL Server, etc.)



Logical Modelling of Data:

A logical data model or logical schema is a data model of a specific problem domain expressed independently of a particular database management product or storage technology (physical data model) but in terms of data structures such as relational tables and columns, object-oriented classes, or XML tags.



DATA QUERING:

```

File Edit Selection View Go Run Terminal Help
OPEN EDITORS JS userRoute.js JS detailsRoute.js
MEALMATE3.0 back-end > routes > JS detailsRoute.js > get() callback
1 const express = require('express');
2
3 const Food = express.Router();
4
5 const FoodDetail = require('../models/foodedetails');
6
7 Food.route('/menu').get((req, res, next) => {
8   FoodDetail.find({})
9     .then((resp) => {
10       res.statusCode = 200;
11       res.setHeader('Content-Type', 'application/json');
12       res.json(resp);
13     }, (err) => next(err));
14     .catch((err) => next(err));
15   });
16
17 Food.route('/home').get((req, res, next) => {
18   FoodDetail.find({}).limit(3)
19     .then((resp) => {
20       res.statusCode = 200;
21       res.setHeader('Content-Type', 'application/json');
22       res.json(resp);
23     }, (err) => next(err));
24     .catch((err) => next(err));
25   });
26
27 Food.route('/particular/:id').get((req, res, next) => {
28   FoodDetail.find({_id: req.params.id})
29     .then((resp) => {
30       res.statusCode = 200;
31       res.setHeader('Content-Type', 'application/json');
32       res.json(resp);
33     }, (err) => next(err));
34     .catch((err) => next(err));
35   });
36
37 module.exports = Food;

```

Ln 14, Col 32 Spaces: 4 UTF-8 CRLF JavaScript Go Live Prettier ENG 20:39 US 12-12-2020

Testing of the Normalized tables with SQL Queries:

Normalization: It is a process of Organizing the data in database to avoid data redundancy insertion anomaly, update anomaly & deletion anomaly.

Let's suppose a customer stores their details in a table named customer that has some attributes. Cust_id, Cust_name, Cust_address, Cust_Contact, Cust_Gender and type of Vehicle for storing the transport vehicle table.

Cust_ID	Cust_Name	Cust_Address	Cust_Contac	Cust_Gende	Places
101	Rick	Delhi	8912312390	Male	Goa
102	John	Kanpur	9900012222 8812123470	Male	Bangalore
103	Herschel	Chennai	9900013274	Female	Hyderabad
101	Rick	Delhi	8912312390	Male	Agra

The above table is not normalized we will see that normalized tables into 1NF, 2NF, 3NF and BCNF

First Normal Form (1NF):

John as two contact numbers stored in the same field According to 1NF each attribute of a table must have a single value.

Cust_I	Cust_Nam	Cust_Adres	Cust_Contac	Cust_Gende	Places
D	e	s	t	r	
101	Rick	Delhi	8912312390	Male	Goa
102	John	Kanpur	9900012222	Male	Bangalore
103	Herschel	Chennai	9900013274	Female	Hyderabad

102	John	Kanpur	8812123470	Male	Bangalore
101	Rick	Delhi	8912312390	Male	Agra

Boyce codd normal form (BCNF):

It is an advance version of 3NF that's why it is also referred as 3.5NF.

BCNF is stricter than 3NF. That every functional dependency $x \rightarrow y$ here 'x' should be the super key of the table.

Customer-details:

Customer-id	Customer-name
101	Rick
102	John
103	Herscher

Customer-address:

Customer address	Customer-contact	Customer-gender
Delhi	8912312390	Male
Kanpur	90001231222	Male
Kanpur	8812323470	Female
Chennai	9900031274	Female

Customer-details:

Customer-id	Place
101	Goa
101	Agra
102	Banglore
103	Hyderabad

Second normal form:

A said is said to be in 2nf if it must be 1nf and no Non-Prime attribute is dependent on the proper subset of any candidate key of table.

An attribute is not part of any candidate key it is known as non-Prime attribute.

Customer-details:

Customer-id	Customer-name	Customer-address	Customer-contact	Customer-gender
101	Rick	Delhi	8912312390	Male
102	John	Kanpur	9000122222	Male
102	John	Kanpur	88123123470	Male
103	Herschel	Chennai	9900031274	Female

Transport-details:

Customer-ID	Place

101	Goa
101	Agra
102	Banglore
103	Hyderabad
104	vizag

here candidate keys: {customer ID, type of vehicle} Non-Prime attribute: customer name

Third normal form:

A table design is set to 3NF it must follow 2NF.

Transitive functional dependency of Non-Prime attribute on any super key should be removed. An attribute that is not part of any candidate key is known as non-prime attribute.

Customer-details:

Customer-id	Customer-name	Customer-contact
101	Rick	8912312390
102	John	9900012222
102	John	8812312340
103	Herscher	9900031274

Customer-Contact details:

Customer-Contact	Customer-details	Place
8912312390	Male	Goa
8912312390	Male	Agra
8812312340	Male	Banglore
9900031274	Female	Hyderabad

CRUD Operations on Database as Back End

```

File Edit Selection View Go Run Terminal Help
EXPLORER OPEN EDITORS userRoute.js
Mealmate3.0 back-end routes userRoute.js ...
21     }
22   }
23   UserRoute.route('/register').post((req, res) => {
24     let user = new User({
25       username: req.body.username,
26       name : req.body.name,
27       email : req.body.email,
28       password : bcrypt.hashSync(req.body.password, 10),
29       address: '',
30       city: '',
31       state: '',
32       gender:'',
33       pincode: '',
34       dob: '',
35       phone: '',
36       aboutme: ''
37     })
38     User.findOne({email:req.body.email},(error,u)>{
39       if()
40         return res.status(400).send('Email Already Exists');
41       else{
42         user.save(error, registeredUser) >> {
43           if (error) {
44             }
45           else {
46             let token = jwt.sign({id:registeredUser._id}, secret)
47             res.status(200).send({token})
48           }
49         }
50       }
51     })
52   })
53 }

5 unchanged chunks
Time: 1097ms
: Compiled successfully.

Date: 2020-12-03T19:01:57.984Z - Hash: 0e013b9e02c01cbaf6d9
4 unchanged chunks
chunk {main} main.js, main.js.map (main) 580 kB [initial] [rendered]
File: 3787...
: Compiled successfully.

SEMINARIO\WE Projects\Mealmate3.0\back-end
> nodemon index.js
[nodemon] 2.0.5
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): ***!
[nodemon] watching extensions: js,mjs,json
[nodemon] starting node index.js
running on the server 3000
connected to the mongod

```

AI

Artificial intelligence in Ecommerce:

AI also benefiting the eCommerce in a large way. AI technology has helped e-commerce to reach greater heights.

AI is transforming the business models of many brands and enterprises. New technological advancements are being innovated in the industries.

The integration of Artificial Intelligence in e-commerce is increasing the marketing standards for many companies. It has helped in creating a more personalized experience by performing the analysis of data sets, and by identifying different patterns of consumer behavior.

AI in e-commerce industry is being utilized by online retailers for providing chatbot services, analyzing customer comments, and for providing personalized services to online shoppers. In fact, a [2019 Ubisend study](#) found that 1 in every 5 consumers are willing to purchase goods or services from a chatbot, while 40% of the online shoppers are looking for great offers and shopping deals from chatbots.

User Stories:

1. As a customer, I need a virtual assistant on the web page, so that I can get clarify my queries.
2. As a web designer, I need to create a virtual assistant i.e., the chatbot on the web page, So the customer can get help from the bot.
3. As a web designer, I need to create a good UI for the bot, So the user can utilize the bot well.
4. As a User, I would be happy if I can order food directly from chatbot itself.
5. As a User, I would be happy if I find a way to contact the Developers through the chatbot.
6. As a Developer, I need to provide basic contact details to the user to interact with us
7. As a Developer, I need to customize the chatbot as per the user's interest. So, the users will feel good when interacting with it.
8. As a Developer, I need to applaud the users who choose for Food Donation.
9. As a user, I would be happy if I can order wine directly from chatbot itself.
10. As a Developer, I need to store the bot API token in a private server, So the bot can't be misused by the others.
11. As a programmer, I need to make all the customers satisfied with the chatbot.
12. As a programmer, I need to test the chatbot with all the test cases, So it will be deployed successfully in the webpage.

Algorithmic Implementation of Artificial Intelligence in Meal Mate:

We have integrated an Artificial Intelligence based User Interaction System into our project.
Working of User Interaction System:

1. This system identifies the Tone and Intention of user and tries to respond to the user with the appropriate response.

Some examples that we have implemented in our project:

Intents:

- a. Greetings: If user tries to greet the system, this intent will be invoked
Ex: Hi, Hello
- b. Thanking: If user tries to thank the system, this intent will be invoked
Ex: Thank you, thnx etc.
- c. Goodbyes: If user tries to end the conversation by saying Bye or something related to that intent, this intent will be invoked
Ex: Bye, C you etc

- ➔ I have mentioned some of the intents that I Have trained to the system and this System is working on the top of Natural Language understanding and Machine Learning Algorithms.
- ➔ As mentioned above it is working on the top of Machine Learning Algorithms it can Identify any sentence which is intended to specific the intent. For that purpose we have trained enough and unbiased data as much as possible.

For example, If user tries to greet the System in new which is not trained it can Understand that sentence.

More precisely, I have trained the model to identify good morning is a greeting and if user enters good afternoon which is not been trained to the model, It will also be identified as a greeting.

- 2. It can identify the particular object in the sentence (more precisely entity)
 - a. Food: If user enters any food item it will be assigned with this entity
 - b. Kitchen tool: If user enters any kitchen tool it will be assigned to this entity.
 - c. Wine: If user enters any wine it will be assigned to this entity.
- ➔ Entities will also be working in the similar way to Intents, even if the model is not trained with exact data it can find the similarities in the patterns using unsupervised learning techniques in this case.
- 3. Finally, we have designed a dialog flow using different condition verifications. Here I will mention some part of our dialog flow:
 - 1. System will introduce itself to the user and asks user to enter his name
 - 2. After receiving name, It will ask the user to how it can help.
 - 3. Based upon user input It will Identify Intent and entity of sentence and tries to jump to the condition where it is programmed to respond when the particular entity or intent is been identified.

For example If user enters:

"Can I know the price of Pizza", System identifies that user is asking information related to the particular food item(entity) and it responds to the user with the particular information based on the condition imposed in the dialog flow.

Algorithm:

1. Bot Introduces itself and greets user.
2. Bot prompts user to enter his/her name.
3. Bot takes input and display the services available

4. Bot prompts user to select 1 from the available options:
 - a. Order Food
 - b. Order Wine
 - c. Donate Food
 - d. Contact Us

5. If user chooses "Order Food":
 - a. Display the top 2 food items that are most selling
 - b. Ask the user if he is interested to buy one among those 2 or if he/she wants another.
 - c. If user chooses one of two food items displayed:
 1. Display few details about that item i.e. Time to prepare, pricing and a small description
 2. If he/she wants to buy they will be redirect to our particular product page for ordering it.
 3. If the user wants to use any other services:
 - a. User will be sent back to step 4
 4. If not bot will wish them good bye and end the chat.
 - d. If the user wants to buy any other product he will be redirected to our food and recepies page.

6. If user chooses "Order Wine":
 - a. Display few details about that item i.e. Pricing and a small description
 - b. If he/she wants to buy they will be redirect to our particular product page for ordering it.
 - c. If the user wants to use any other services:
 1. User will be sent back to step 4
 - d. If not bot will wish them good bye and end the chat.

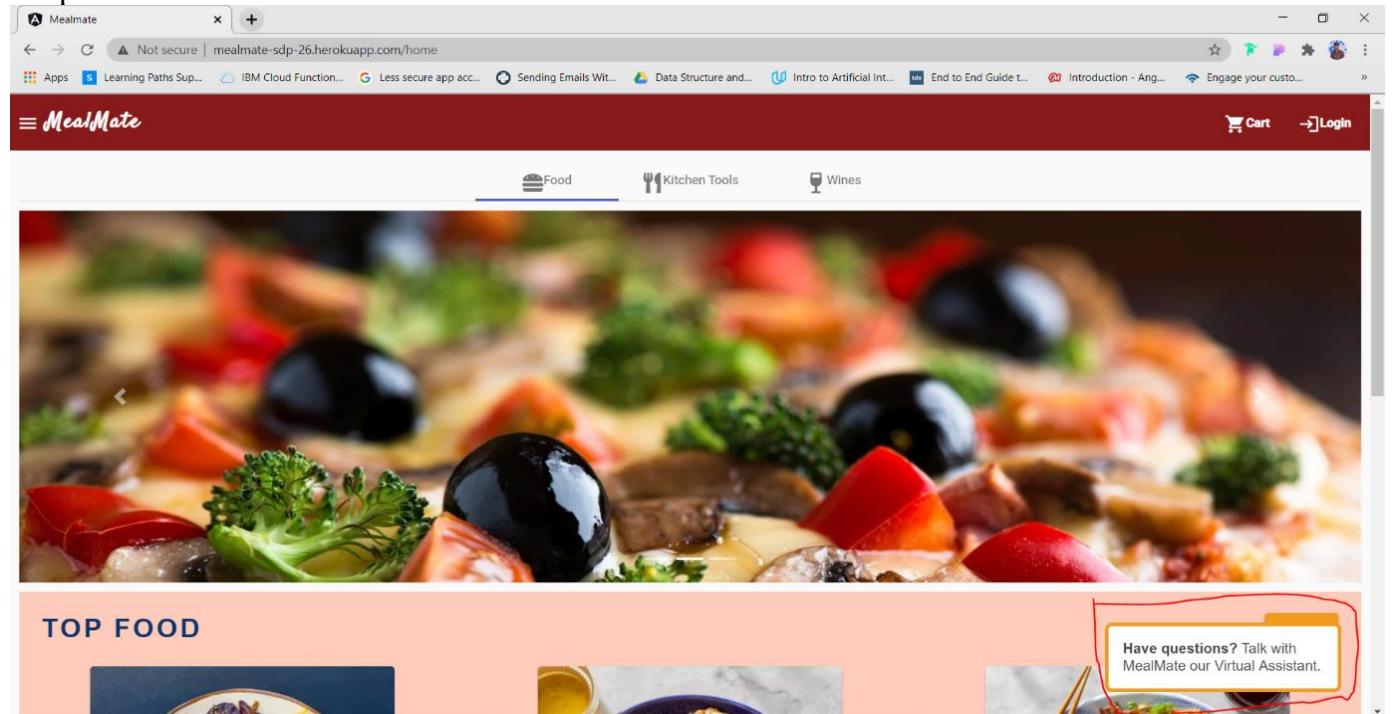
7. If user chooses "Donate Food":
 - a. Bot will applause the user and redirect him to our Food Donation page.

8. If user chooses "Contact Us":
 - a. Bot will provide some basic ways to contact us and also redirect them to our Contact Us page.

Unit Test Cases:

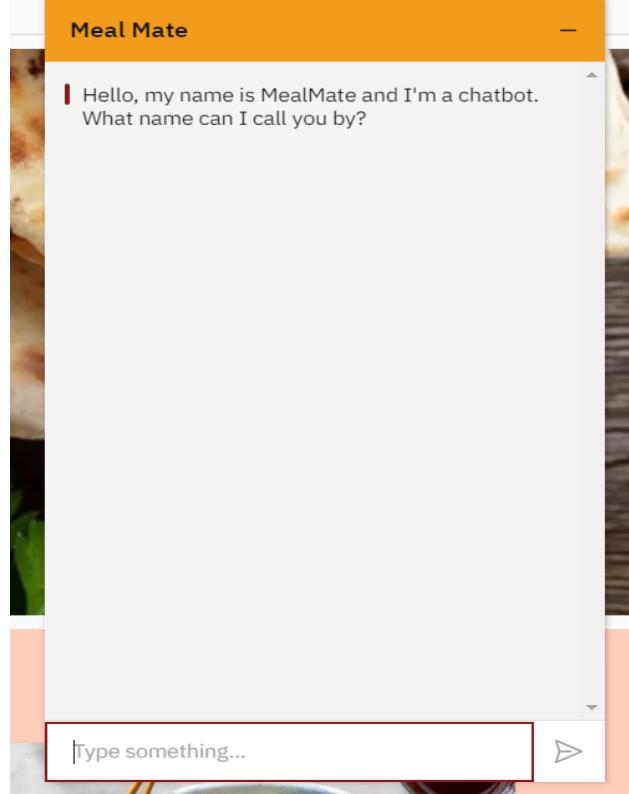
1. Is the webpage displaying the launching message right at loading the site

Output:



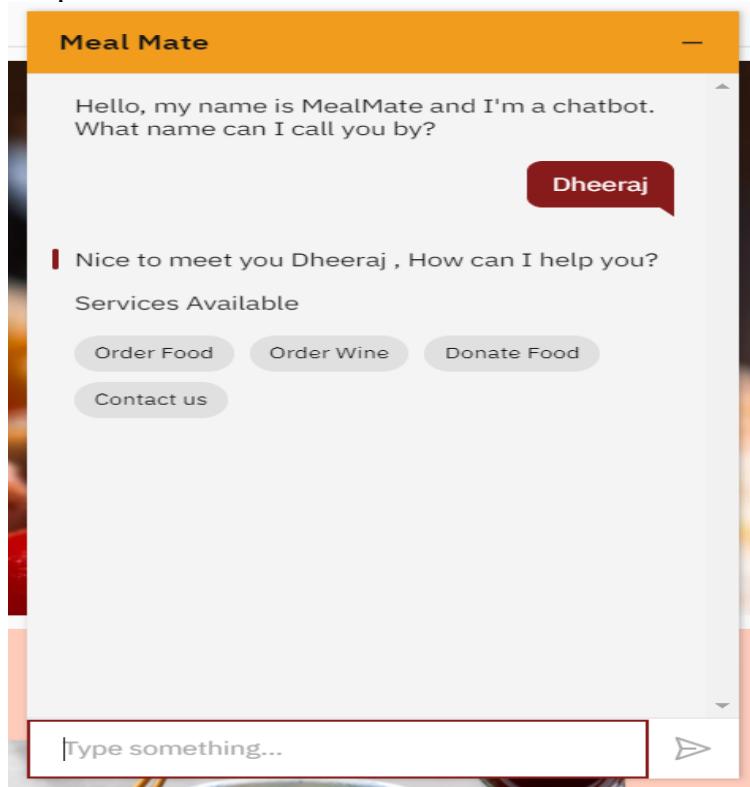
2. Is the Bot introducing itself and prompting the user to enter his/her name

Output:



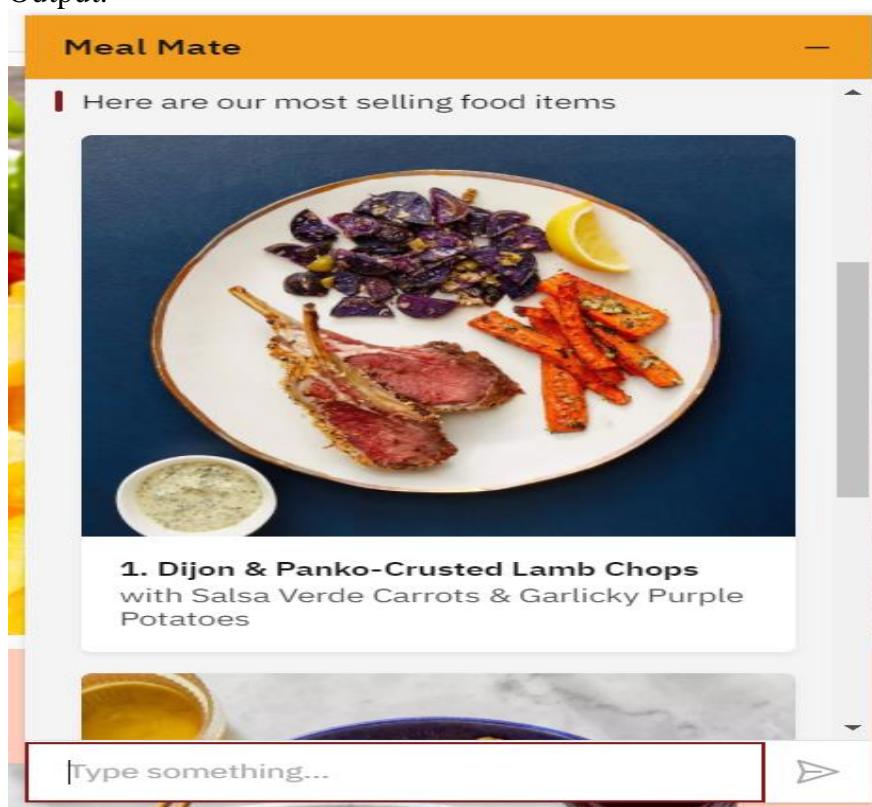
3. Is the bot accepting the name as expected and displaying the available services?

Output:



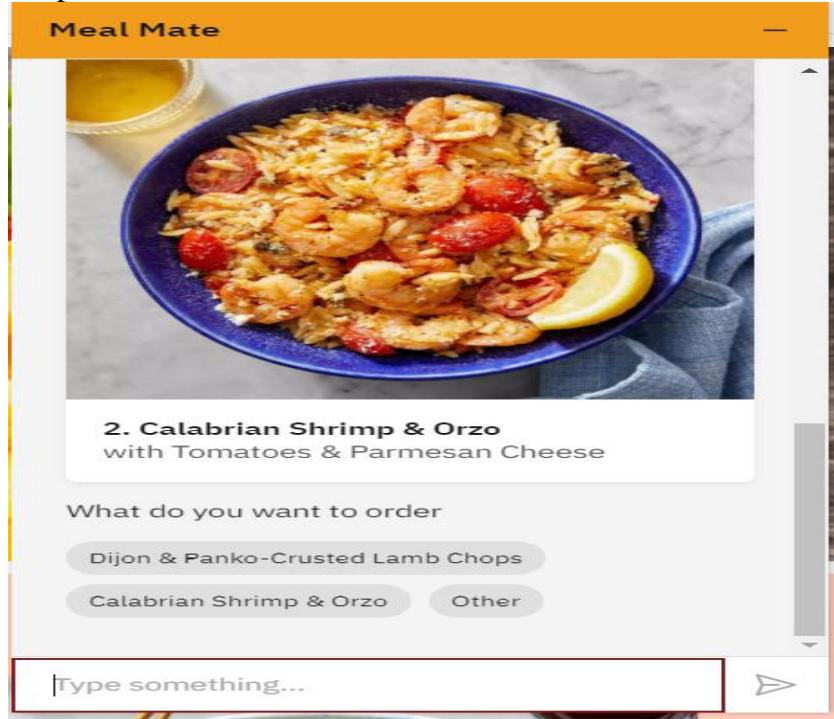
4. Is Bot displaying top foods when clicking on the Order Food Option:

Output:



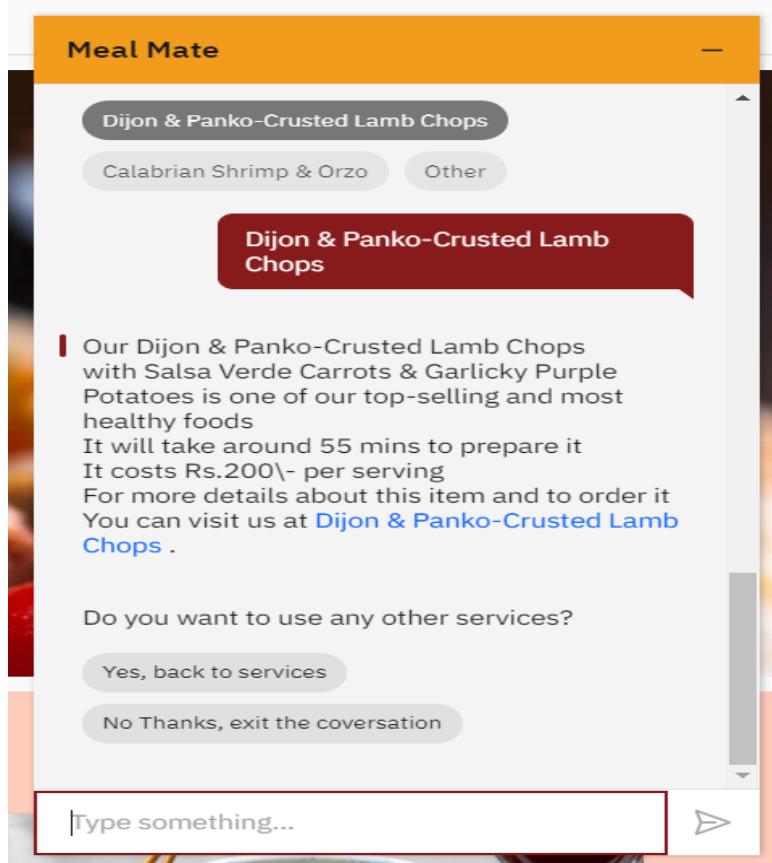
5. Is bot displaying options to order the 2 food items displayed above and giving chance to order other food

Output:

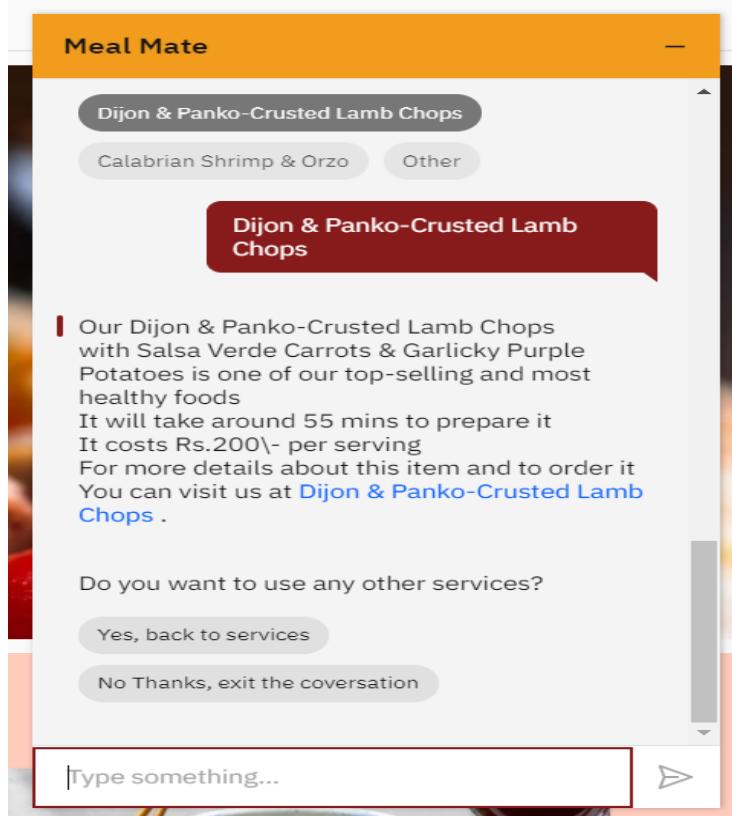


6. Is Bot displaying description of the product and redirecting the user to the particular product page.

Output:

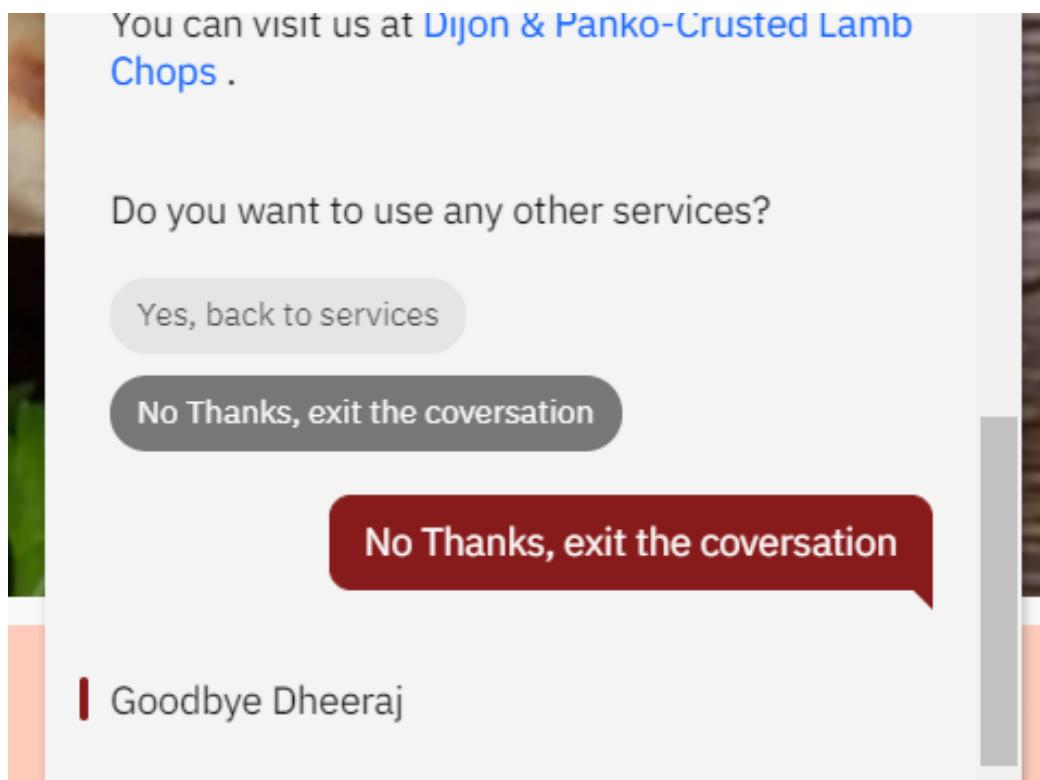


7. Is bot allowing user to go back to the services page when he wants to Output:



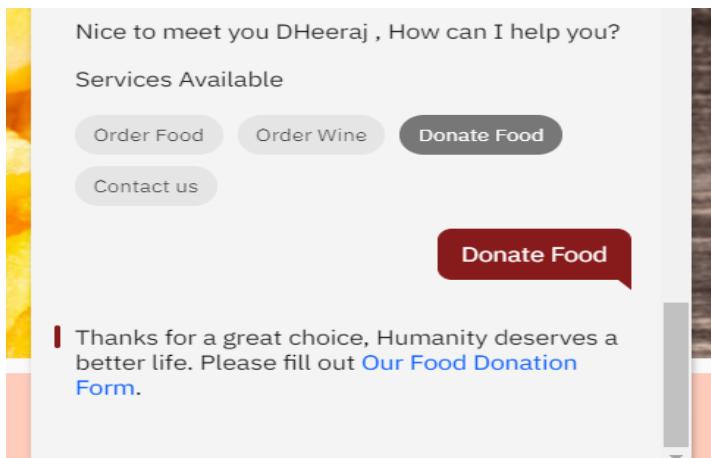
8. Is the bot wishing user good bye when he clicks "Exit":

Output:



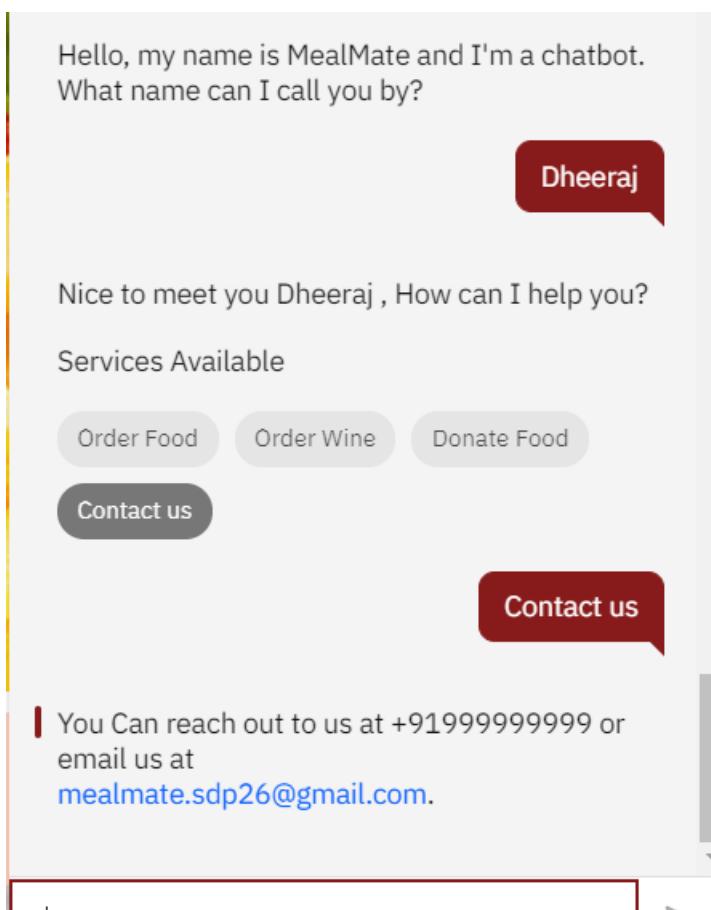
9. Is bot applauding user when he/she chooses food donation

Output:



10. Is bot providing basic contact details and redirecting to Contact Us page when user chooses "Contact Us":

Output:



MSWD

Tools:

1. ANGULAR
2. MONGODB(OPTIONAL)
3. NODE
4. EXPRESS

MSWD is the main domain in building the project. Using the tools of MSWD we build the front-end part of the website using Angular and Design the backend using the coordination with the topics such as MONGODB, NODE AND EXPRESS.

Express is used to serve the data from Database to Front-End and Vice Versa.

The role of a MSWD application on the project is to solve various challenges, such as:

1. Performance: NodeJS offers the excellent performance with all the above features, crucial for any e-commerce or m-commerce application.
2. Scalability: Scalability is one of non-compromising aspect of any e-commerce application. MongoDB is NoSQL database highly designed for Cloud and Scalability with full support of cluster. Once we plug in MongoDB, it spreads across cluster of the servers to provide failover support and automatic database replication. It adds a lot flexibility at database layer.
3. Efficient Frontend: with MEAN or MERN stack, we can use either Angular or ReactJS as a front-end language which has many advantages.
6. Real Time Response: NodeJS is pretty handy with Socket.io and with help of reactive frameworks like AngularJS and ReactJS, we can get the benefit of instant updates like product quantity, price etc....
7. Better User Experience: User experience is most important factor for any ecommerce app. As MEAN has separate reactive framework for front-end, we have option to serve better user experience with instant update without reloading page.

Creation of Angular Forms, Use of Materials & Services to design Front End

Angular Forms: -

We have used angular forms in two components (Modules) Food Donation and Contact Us.
Our Basic Idea behind Food Donation Form is the user who wants to donate may be either money / food

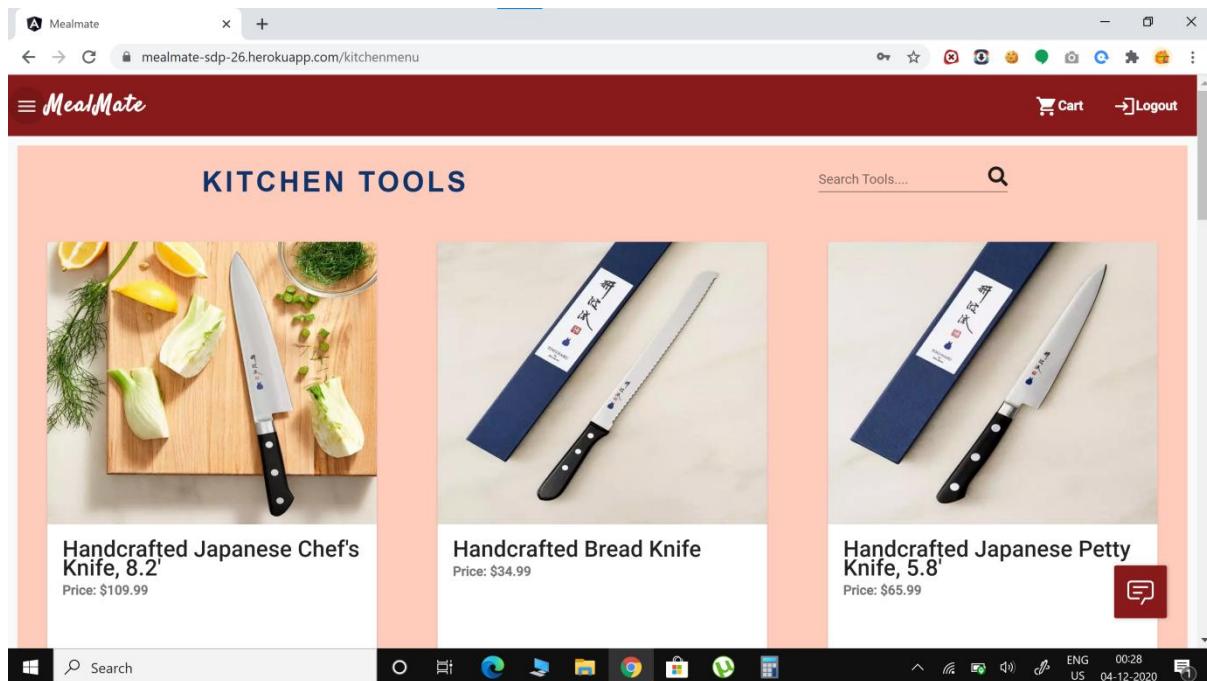
The screenshot shows a web browser window for 'mealmate-sdp-26.herokuapp.com/fooodonation'. The main content is a 'FOOD DONATION FORM' with fields for First Name, Last Name, Address 1, Address 2, City, Pincode, Phone, and Email. Below the form is a 'Submit' button. At the bottom of the page, there's a navigation bar with links for Home, Contact Us, and Logout. To the right of the navigation bar is a section for a Virtual Assistant named 'MealMate'. The footer contains contact information and a copyright notice.

Contact Us form is Used to store the queries/feedbacks given by the customers

The screenshot shows a web browser window for 'mealmate-sdp-26.herokuapp.com/contactus'. On the left, there's a yellow sidebar with 'Mealmate' branding, company address (LEPL, Centro Mall, 3rd Floor, Opp CPR Hotel Fortune, Murali Park, MG Rd, Labbipet, Vijayawada, Andhra Pradesh, 520010), and a 'ContactUs' section. The main content area is titled 'CONTACT US' and contains fields for Name, Email, Phone Number, and a 'Leave a comment' text area. Below these is a 'Submit' button. A 'Virtual Assistant' box is also present. The page includes a navigation bar with links for Home, Contact Us, and Logout, and a footer with contact information and a copyright notice.

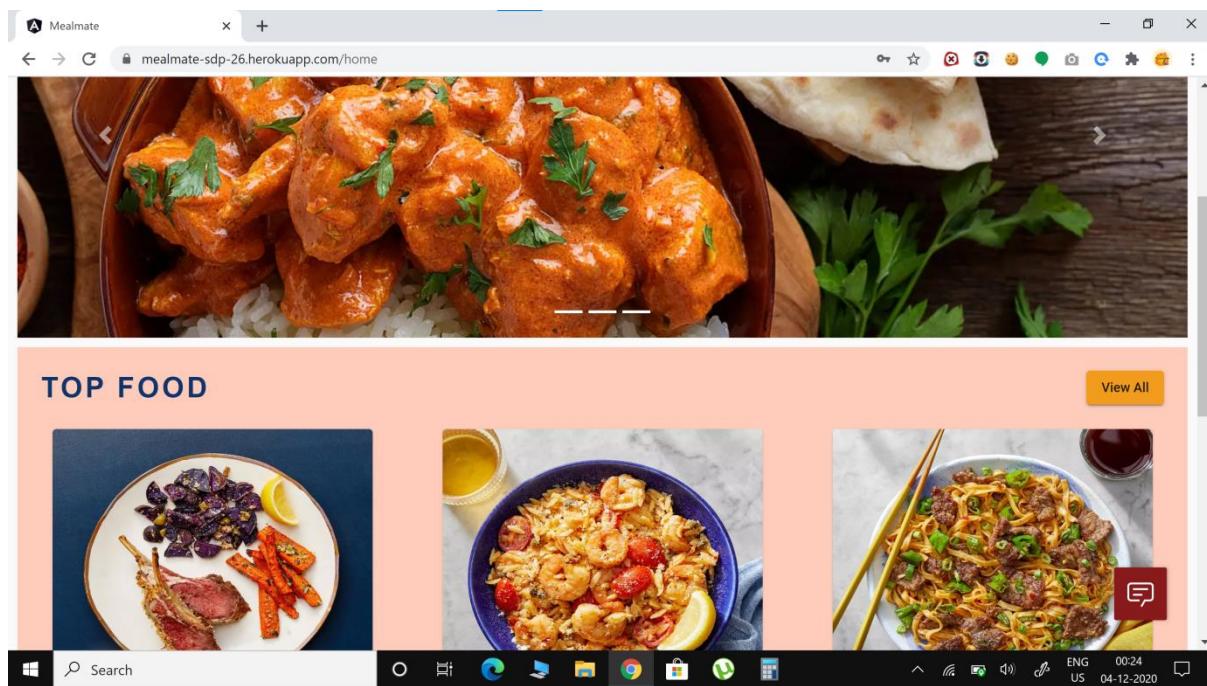
Use of Materials & Services to design Front End

Entire Front-end was developed using angular and angular material. The website is also responsive and tried hard to create a rich user Interface

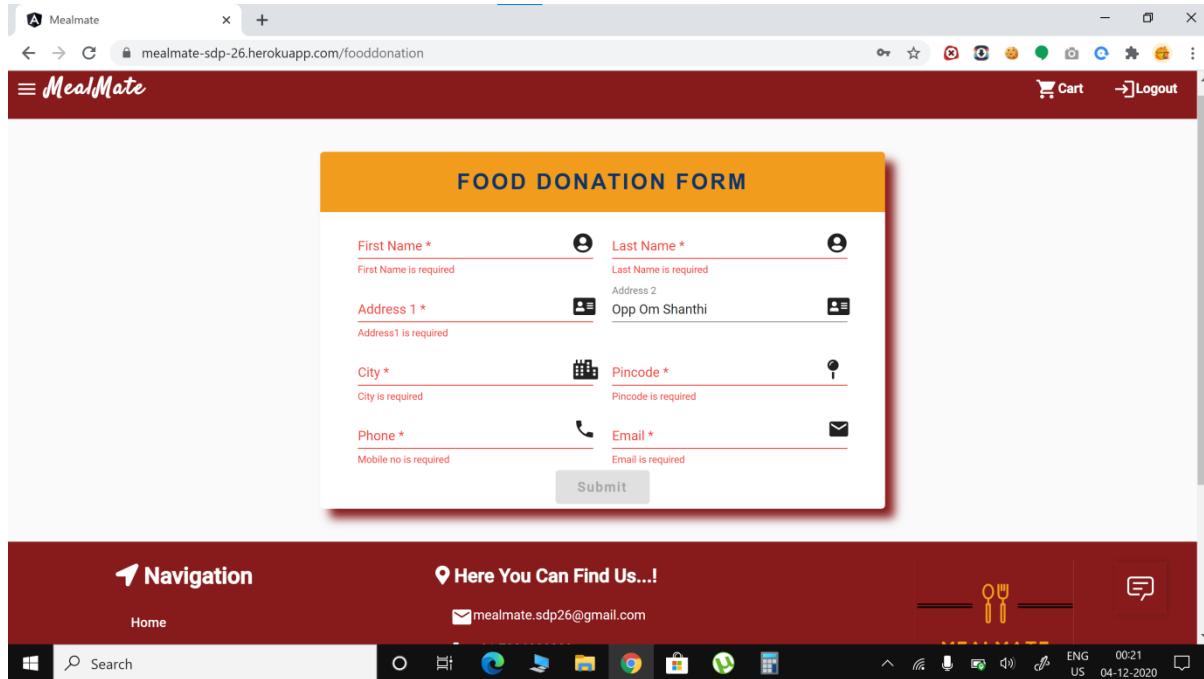


Rich User Interface (Front end) including form validations

As mentioned previously, entire Front-end was developed using angular and angular material. The website is also responsive and tried hard to create a rich user Interface

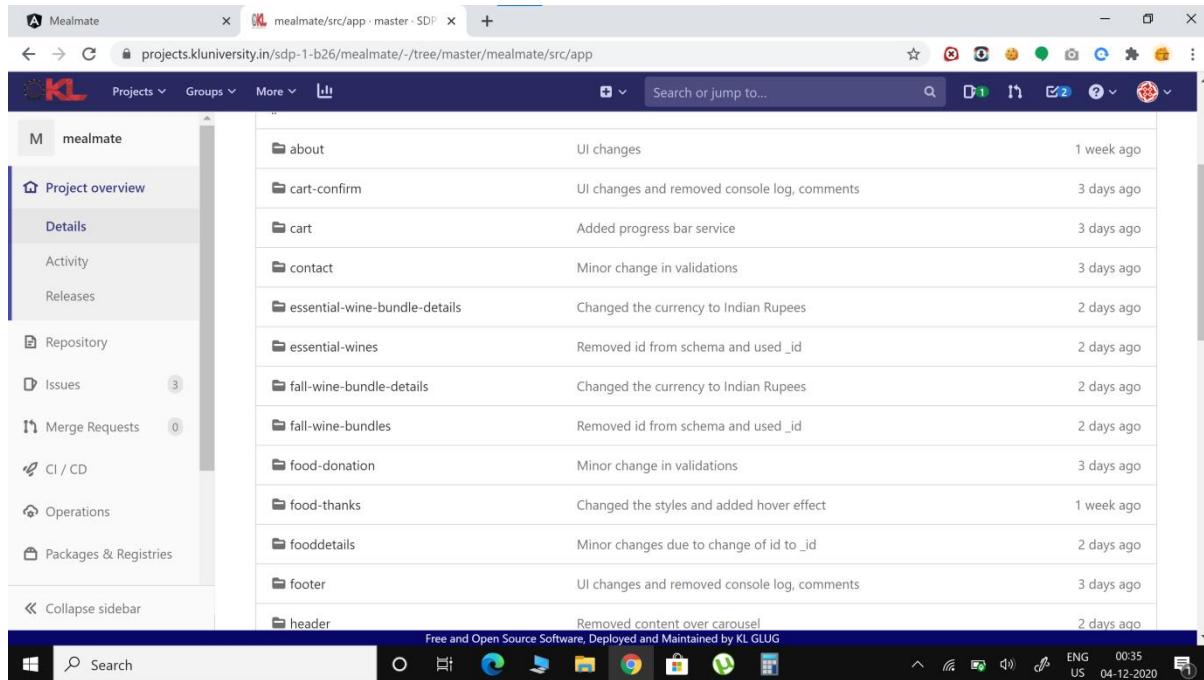


And Form Validations is also done perfectly based on the requirements (wherever needed)
One such example



Component based Angular Programming

We have done the project using Component based Angular Programming only. We got 24 components in total. Here is the picture as a proof. The files have been pushed to gitlab.



Creation of webserver using Node.js

Here the pic of Creation of webserver using Node.js along with successful execution in the terminal

```

File Edit Selection View Go Run Terminal Help
index.js - Mealmate3.0 - Visual Studio Code

OPEN EDITORS
JS index.js > ...
back-end > JS index.js > ...
17 const EssentialWine=require('./routes/essential_wineRoute');
18 const UserRoute=require('./routes/userRoute');
19 const CartRoute=require('./routes/cartRoute');
20 const OrderRoute=require('./routes/orderRoute');
21 const ContactRoute=require('./routes/contactRoute');
22
23 app.use(cors());
24 app.use(bodyParser.json());
25 app.use('/food',FoodRoute);
26 app.use('/kitchen',KitchenRoute);
27 app.use('/foodonation',FoodDonation);
28 app.use('/fallwinebundle',FallWineBundle);
29 app.use('/essentialwine',EssentialWine);
30 app.use('/user',UserRoute);
31 app.use('/cart',CartRoute);
32 app.use('/order',OrderRoute);
33 app.use('/contact',ContactRoute)
34
35 app.listen(port, () => console.log(`running on the server ${port}`));

```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

: Compiled successfully.

Date: 2020-12-03T17:14:52.249Z - Hash: 46a4dc0118f181f2f4e0
5 unchanged chunks

Time: 1097ms
: Compiled successfully.

Date: 2020-12-03T19:01:57.984Z - Hash: 0a013b9e0c01cbaf6d9
4 unchanged chunks
chunk {main} main.js, main.js.map (main) 580 kB [initial] [rendered]
Time: 3787ms
: Compiled successfully.

> Mealmate3.0\back-end> npm start

> back-end@1.0.0 start C:\Users\NV PRASAD\Desktop\B.Tech\2ND YEAR 1ST SEM\MSWD\WE Projects\Mealmate3.0\back-end
> nodemon index.js

[nodemon] 2.0.5
[nodemon] to restart at any time, enter `rs`
[nodemon] watching path(s): *.*
[nodemon] watching extensions: js,mjs,json
[nodemon] starting `node index.js`
running on the server 3000
connected to the mongodb

Ln 15, Col 59 Spaces: 4 UTF-8 CRLF JavaScript ⚡ Go Live Prettier ⌂

Session Management

The session management is done using json web tokens.

When the user logged in a token is generated and is valid till he logged in. After he logout the token is deleted. Here is the pic of token stored in local storage.

Key	Value
token	eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ

KITCHEN TOOLS

Search Tools...

Handcrafted Japanese Chef's Knife, 8.2'

Price: \$109.99

Angular and MongoDB with Node.js interaction

This is the code where we have successfully implemented Angular and MongoDB with Node.js interaction

File Edit Selection View Go Run Terminal Help index.js - Mealmate3.0 - Visual Studio Code

EXPLORER OPEN EDITORS JS index.js x

back-end > JS index.js ...

```
1 const express = require('express');
2 const mongoose = require("mongoose");
3 const bodyParser = require('body-parser');
4 const cors = require('cors');
5 const connection = mongoose.connection;
6 const app = express();
7 const port = process.env.PORT || 3000;
8
9 mongoose.connect('mongodb+srv://rk:190031187@first.cpozf.mongodb.net/mealmate?retryWrites=true&w=majority',{useNewUrlParser: true , useUnifiedTopology: true});
10
11 connection.once('open', () => console.log("connected to the mongodb"));
12
13 const FoodRoute=require('../routes/detailsRoute');
14 const KitchenRoute=require('../routes/kitchentoolsRoute');
15 const Fooddonation=require('../routes/food_donationRoute');
16 const FallwineBundle=require('../routes/fall_wine_bundleRoute');
17 const EssentialWine=require('../routes/essential_wineRoute');
18 const UserRoute=require('../routes/userRoute');
19 const CartRoute=require('../routes/cartRoute');
20 const OrderRoute=require('../routes/orderRoute');
21 const ContactRoute=require('../routes/contactRoute');
22
23 app.use(cors());
24 app.use(bodyParser.json());
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

1: node, node

5 unchanged chunks

Time: 1097ms
: Compiled successfully.

Date: 2020-12-03T19:01:57.984Z - Hash: 0a013b9e02c01cbaf6d9

4 unchanged chunks
chunk {main} main.js, main.js.map (main) 580 kB [initial] [rendered]

Time: 3787ms
: Compiled successfully.

[node] 2.0.5
[node] to restart at any time, enter `rs`
[node] watching path(s): *.
[node] watching extensions: js,mjs,json
[node] starting `node index.js`
running on the server 3000
connected to the mongodb

master* 01:21 0 0 0 0 In 33, Col 33 Spaces: 4 UTF-8 CRLF JavaScript Go Live Prettier ENG 00:42 04-12-2020

CRUD Operations on Database as Back End

We have implemented the all the crud operations

```
File Edit Selection View Go Run Terminal Help
userRoute.js - mealmate3.0 - Visual Studio Code

EXPLORER
  ✓ OPEN EDITORS
    x userRoute.js back-end-routes
  MEALMATE3.0
    ✓ back-end
      ✓ models
      ✓ node_modules
        ✓ routes
          carRoute.js
          contactRoute.js
          detailsRoute.js
          essential_wineRoute.js
          fall_wine_bundleRoute.js
          food_donationRoute.js
          kitchenrootRoute.js
          orderRoute.js
        ✓ userRoute.js
        gitignore
        config.env
        index.js
        package-lock.json
        package.json
      > mealmate

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
node, node
5 unchanged chunks
Time: 1097ms
: Compiled successfully.

Date: 2020-11-03T19:01:57.984Z Hash: 0e013b9e02c01cbef6d9
4 unchanged chunks
chunk [main] main.js, main.js.map (main) 580 kB [initial] [rendered]
Time: 3787ms
: Compiled successfully.

[nodemon] 2.0.5
[nodemon] to quit at any time, enter `rs`
[nodemon] watching path(s): *.*
[nodemon] watching extensions: js,mjs,json
[nodemon] starting node index.js
running on the server 3000
connected to the mongodb

```

SKILL DEVELOPMENT PROJECT-1

BATCH 26

The screenshot shows the Visual Studio Code interface with the following details:

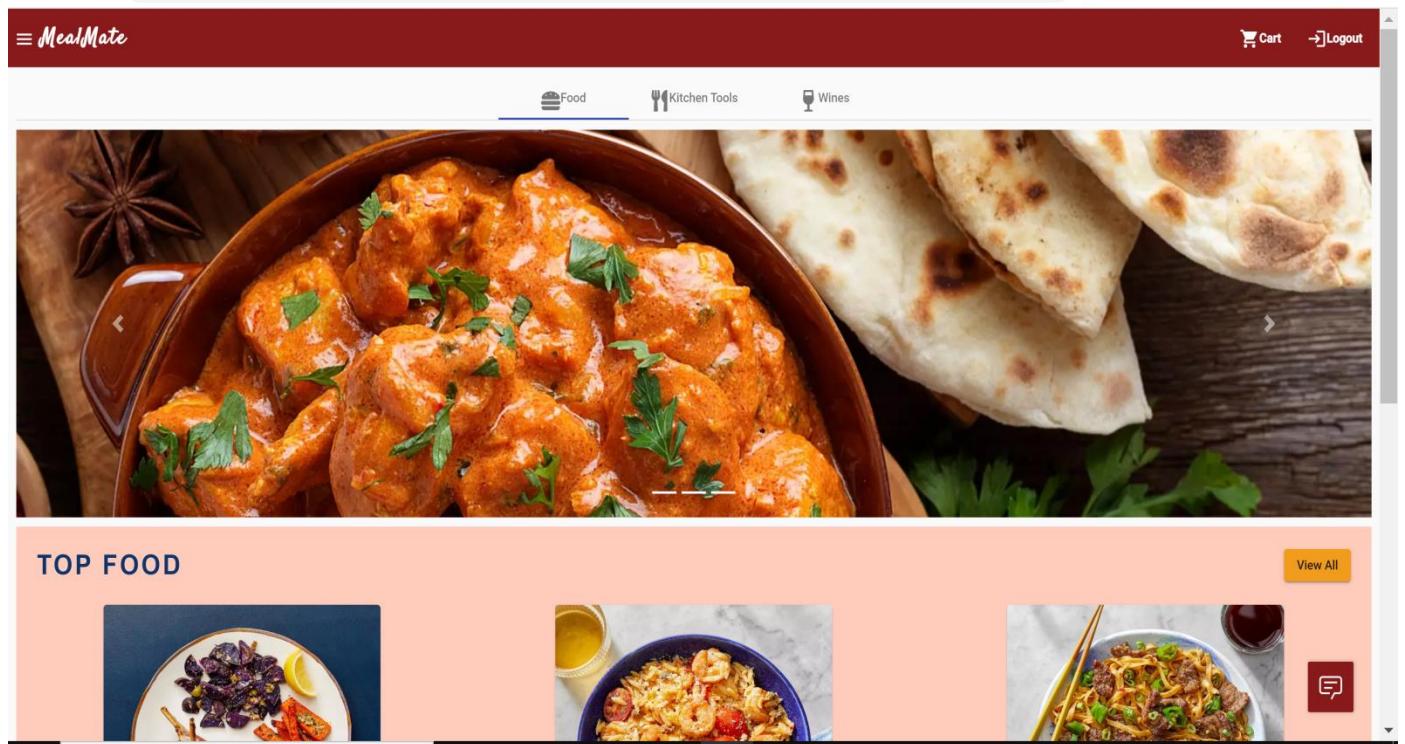
- File Explorer:** Shows the project structure for 'mealmate'. The 'back-end' folder contains several files: carRoute.js, contactRoute.js, detailsRoute.js, essential_wineRoute.js, fall_wine_bundleRoute.js, food_donationRoute.js, kitchenRoute.js, orderRoute.js, userRoute.js, gitignore, config.env, index.js, package-lock.json, and package.json.
- Terminal:** The terminal window at the bottom is running the command `node index.js`. The output shows the application has started on port 3000 and is connected to the MongoDB database.
- Status Bar:** The status bar at the bottom displays the current file as 'kitchenRoute.js', the status as '0:01:21', and the date/time as '04-12-2020 00:46'.

SKILL DEVELOPMENT PROJECT-1

BATCH 26

Final output as per the client requirements

We have successfully designed the website as per the client requirements.



Thank You 😊

- Team MEALMATE

NAME	ID NUMBER
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