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A Proposal of an Interactive Web Application Meal Appeal: One Stop Solution for all Meals

Harshee Pitroda
Department of Computer Engineering
NMIMS University, Mukesh Patel School of
Technology Management & Engineering Mumbai, India

Abstract:- Lockdowns had forced the closure of eateries and restaurants across the globe, but they had also created new opportunities for aspiring home cooks and anybody else who simply wanted to explore in the kitchen and perhaps pick up cooking as a new hobby to cut through time. Hence in this paper, I introduce an interactive web application Meal Appeal, a one stop solution for all meals. Meal Appeal is a feature rich full stack website. Meal Appeal is a community that approaches cooking from several ends of the spectrum. Meal Appeal simplifies home cooking. Meal Appeal provides a variety of recipes that are nutritionally rich, quick, and simple to prepare, taking into account various eating patterns, and gives food recipes that are delightful to eat and covers all bases. Meal Appeal honours and encourages healthy home cooking, among other things. Meal Appeal's purpose is to inspire visitors to prepare feel-good meals. On the other hand, this is not only an ordinary recipe website, there are a lot of interactive components, games, a platform to showcase the culinary talents, a platform to connect with other food lovers through a real time community chat feature and also real time and animated graphical visualizations to track the visiting in the website on the administration side. A survey was also conducted and their responses have been thoroughly analyzed and visualized through the Power Bi software, further the requirements and expectations of the respondents have also been successfully integrated in the website. This website is built using React.js, Bootstrap, Material UI, styled components, Framer Motions for the frontend, Express and HTTP for the middleware, Node.js for the backend, Socket.io web socket and Node.js for real time communication, MySQL for database and GitHub for version control.

Keywords:- *back end, community chat, database, full stack website, front end, home cooking, Interactive Components, middle ware, real time communication.*

I. INTRODUCTION

Pandemic-induced lockdowns provided more time at home for trying new recipes, honing cooking abilities, and cooking up a creative storm in the kitchen. For others, cooking in captivity meant putting together quick, easy, healthy meals that might serve a family. The lockdown led to a massive rise in home cooking with 42.0% of people cooking more frequently as barriers such as time constraints were reduced [2]. On the other hand, there were also closure of restaurants, social distancing by imposing safety standards, and fear of the COVID-19 pandemic that could be the factors that justified the decrease in the consumption of fast-food and food delivered promoting cooking at home [3]. Cooking is yet another art that has been passed down through generations. From a survey conducted, participants highlighted the meaning of 'home cooking' as a demonstration of love and care [11]. Further research exploring definitions, perceptions and experiences associated with different potential subtypes of cooking at home is required [11].

As a result, I created Meal Appeal, a destination for foodies as well as people who find cooking to merely be a chore. The big concept of this website is to celebrate how important, creative, nourishing, fun, and delicious food can be. Meal Appeal is a feature-rich full stack website built using cutting-edge technologies. The website's goal is to inspire and encourage others to try their hands at cooking and enjoy it. Using this website to discover new recipes will allow them to be more creative, give them a feeling of accomplishment, and strengthen their bonds with their family and friends. Home cooking has already been linked to better diet quality and thus a better health status [2].

A. Aims and Objectives

The aims and objectives for building the Meal Appeal web application are as follows:

- Expecting more creativity than regular food meals - Cooking has almost become a hobby rather than a necessity in these times. People have used the lockdown period to show off their ingenuity and creativity even with the few ingredients available, and the present trend indicates that people want more than just conventional meals; they want creativity and healthy nourishment. Hence in the Meal Appeal web application there are several ways to explore creative recipes such as uploading an innovative recipe, sharing it in the community via the community chat feature and filtering out recipes based on ingredients and different dietary patterns etc.
- Meal issues faced by teenagers and men – For those set of individuals, who were dependent on cooks, restaurants and other food services before lockdowns, had faced issues cooking during lockdowns. Here in the Meal Appeal web application there are a lot of quick and easy recipes even for beginners and a lot of other features that assist all the beginners, teenagers and men.
- Unaware of home remedies for health issues – There are a lot of citizens who are unaware of the long aged, old home remedies that can be utilized to treat some common health issues. Hence in the Meal Appeal web application there is a section to gain knowledge on the various home remedies.

- Have interactive components - The aim is also to have interactive components in the Meal Appeal web application, as these components drive more engagement, as a result, users spend more time on the website as it interacts with them.

B. Results and Analysis

A survey was conducted through the google forms platform to understand and gauge public opinions regarding their cooking trends, dietary patterns and features they want in a food related website. The responses helped to tune my ideas and create a better web application that can benefit the society. The survey form was filled by 221 respondents. The results and analysis for the same is portrayed below.

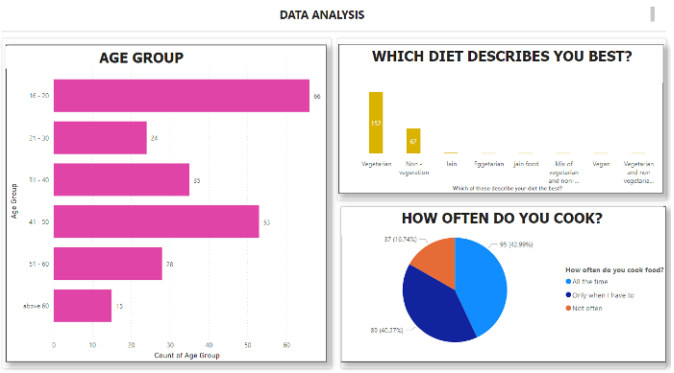

Fig. 1: Visualization for Age Group, Diet Type and how often they cook

From Figure 1, we can see that there are 66 respondents who are aged between 16 – 20 years, 24 respondents aged between 21 – 30 years, 35 respondents aged between 31 – 40 years, 53 respondents aged between 41 – 50 years, 28 respondents aged between 51 – 60 years and 15 respondents above the age of 60 years. Further from Figure 1, we can see that 152 respondents have a vegetarian diet, 62 respondents have a non-vegetarian diet, 2 respondents have a Jain diet, 2 respondents have a mix of both vegetarian and non-vegetarian diet, 1 respondent has a vegan diet and 1 respondent has an eggetarian diet. Lastly from Figure 1 we can see that 42.99% of the total respondents cook all the time, 40.27% of the total respondents cook only when they have to and 16.74% of the total respondents do not cook often.

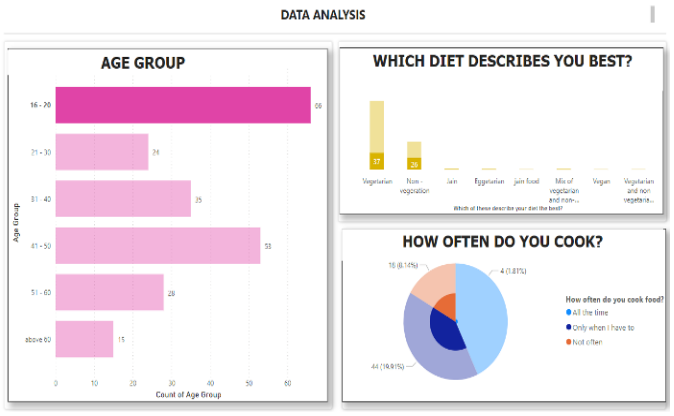

Fig. 2. Visualization for the Age group 16 – 20 years

In Figure 2, we have visualized data for the Age Group 16 – 20 years. There were 66 respondents out of the total respondents who were aged between 16 – 20 years. Out of the 66 respondents, 37 respondents describe their diet as vegetarian, 26 respondents describe their diet as non-vegetarian, 1 respondent describes their diet as Jain diet, 1 respondent describes their diet as a mix of vegetarian and non-vegetarian and 1 respondent describes their diet as eggetarian diet. Out of the 66 respondents 1.81% cook all the time, 19.91% cook only when they have to and 8.14% do not cook often.

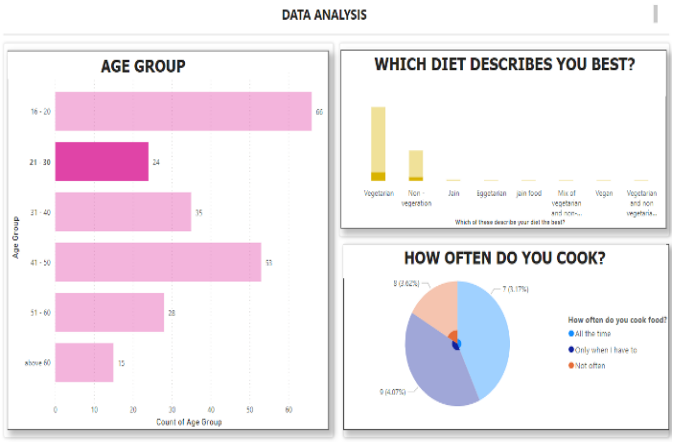

Fig. 3: Visualization for the Age group 21 – 30 years

In Figure 3, we have visualized data for the Age Group 21 – 30 years. There were 24 respondents out of the total respondents who were aged between 21 – 30 years. Out of the 24 respondents, 17 respondents describe their diet as vegetarian and 7 respondents describe their diet as non-vegetarian. Out of the 24 respondents 3.17% cook all the time, 4.07% cook only when they have to and 3.17% do not cook often.

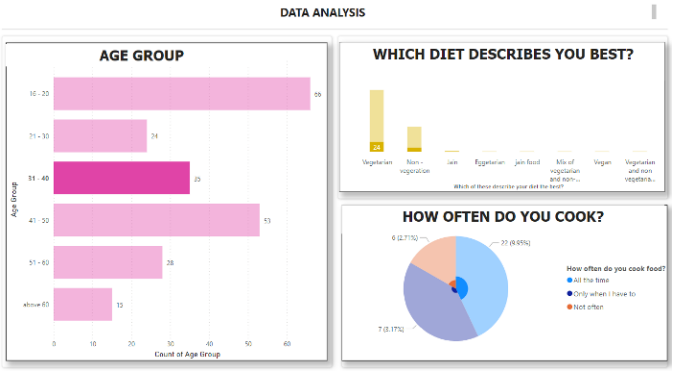

Fig. 4: Visualization for the Age group 31 – 40 years

In Figure 4, we have visualized data for the Age Group 31 – 40 years. There were 35 respondents out of the total respondents who were aged between 31 – 40 years. Out of the 35 respondents, 24 respondents describe their diet as vegetarian, 10 respondents describe their diet as non-vegetarian and 1 respondent describes their diet as Jain diet. Out of the 35 respondents 9.95% cook all the time, 3.17% cook only when they have to and 2.71% do not cook often.

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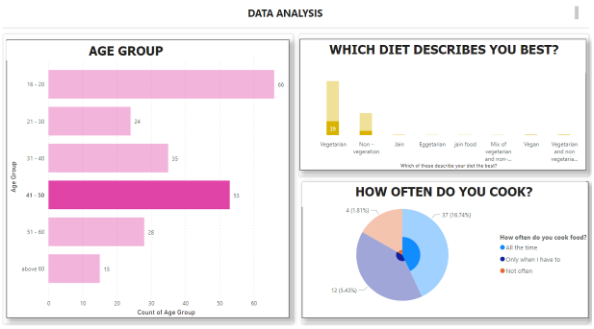

Fig. 5: Visualization for the Age group 41 – 50 years

In Figure 5, we have visualized data for the Age Group 41 – 50 years. There were 53 respondents out of the total respondents who were aged between 41 – 50 years. Out of the 53 respondents, 39 respondents describe their diet as vegetarian, 12 respondents describe their diet as non-vegetarian, 1 respondent describes their diet as Vegan diet and 1 respondent describes their diet as mix of vegetarian and non-vegetarian. Out of the 53 respondents 16.74% cook all the time, 6.43% cook only when they have to and 1.81% do not cook often.

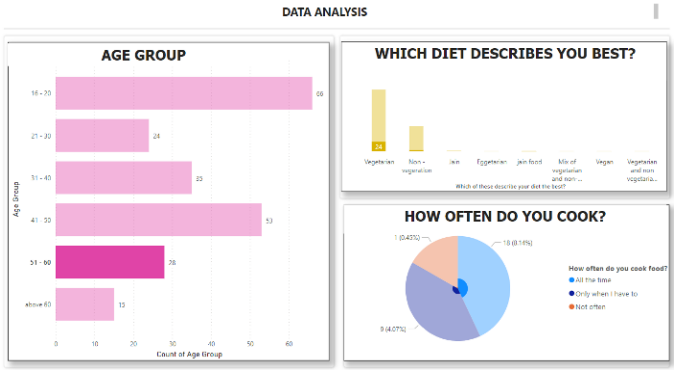

Fig. 6: Visualization for the Age group 51 – 60 years

In Figure 6, we have visualized data for the Age Group 51 – 60 years. There were 28 respondents out of the total respondents who were aged between 51 – 60 years. Out of the 28 respondents, 24 respondents describe their diet as vegetarian, 3 respondents describe their diet as non-vegetarian and 1 respondent describes their diet as Jain diet. Out of the 28 respondents 8.14% cook all the time, 4.07% cook only when they have to and 0.45% do not cook often.

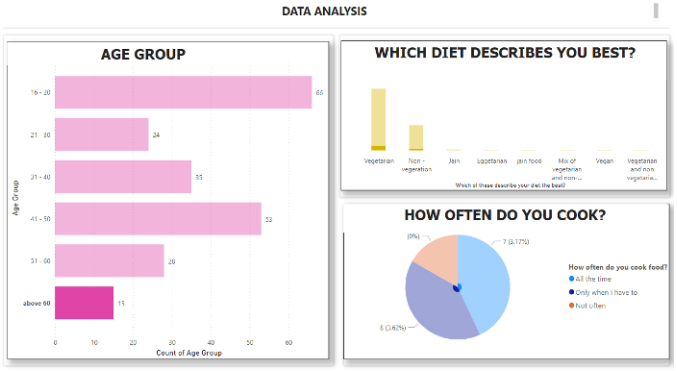

Fig. 7: Visualization for the Age group above 60 years

In Figure 7, we have visualized data for the Age Group above 60 years. There were 15 respondents out of the total respondents who were aged between above 60 years. Out of the 15 respondents, 11 respondents describe their diet as vegetarian and 4 describe their diet as non-vegetarian. Out of the 15 respondents 3.17% cook all the time, 3.62% cook only when they have to and 0% do not cook often.

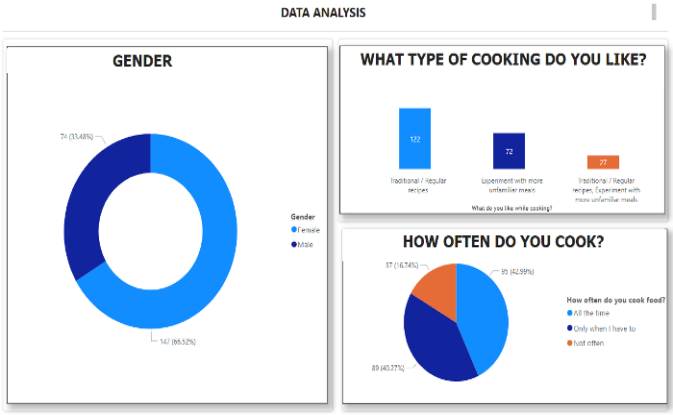

Fig. 8: Visualization for Gender, what type of cooking do they like doing and how often they cook

In Figure 8, we can see that 33.48% of the total respondents are males and 66.52% of the total respondents are female. 122 respondents of the total respondents like cooking traditional regular recipes, 72 respondents of the total respondents like experimenting with unfamiliar and creative meals, and 27 respondents of the total respondents like doing both cooking traditional regular recipes and experimenting with unfamiliar and creative meals.

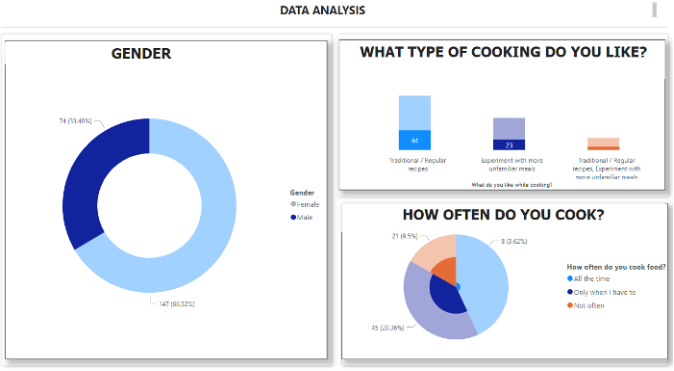

Fig. 9. Visualization for Gender Male

In Figure 9, it is seen that 44 males like cooking only traditional regular recipes, 23 males like experimenting with unfamiliar and creative meals and 7 males like doing both. From Figure 9 we can further see that 3.62% of the males cook all the time, 20.36% of the males cook only when they have to and 9.5% of the males do not cook often.

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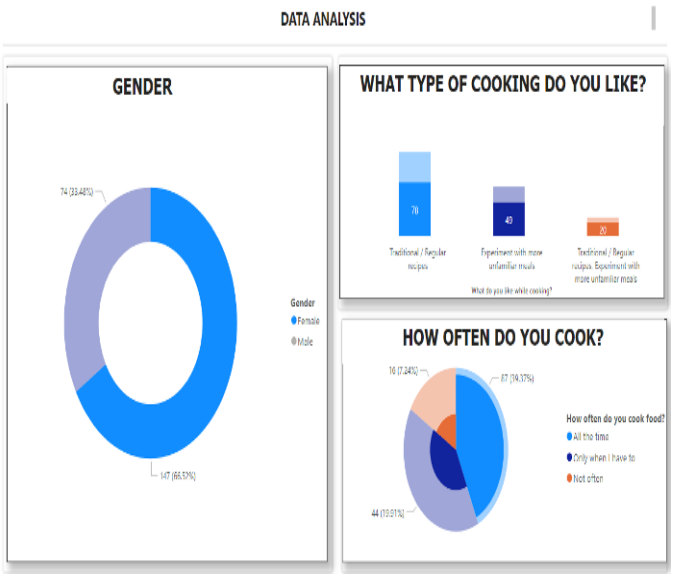

Fig. 10: Visualization for Gender Female

In Figure 10, it is seen that 78 females like cooking only traditional regular recipes, 49 females like experimenting with unfamiliar and creative meals and 20 females like doing both. From Figure 10, we can further see that 39.37% of the females cook all the time, 19.91% of the females cook only when they have to and 7.24% of the males do not cook often.

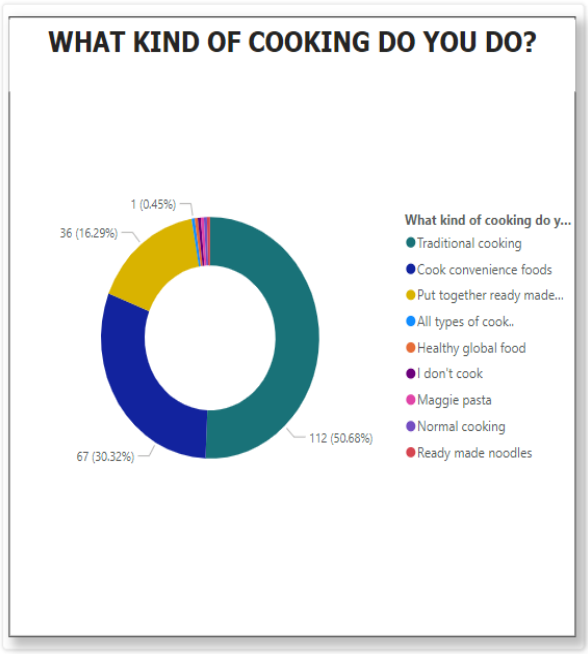

Fig. 11. Visualization for what kind of cooking do you do

In Figure 11, it is seen that 50.68% of the total respondents do traditional cooking, 30.32% of the total respondents cook convenience food, 16.29% of the total respondents put together ready-made ingredients to make a complete meal (eg - use ready-made sauces, puree) and the other 2.71% of the respondents either cook ready-made noodles, do all types of cooking, cook healthy food or don't cook.

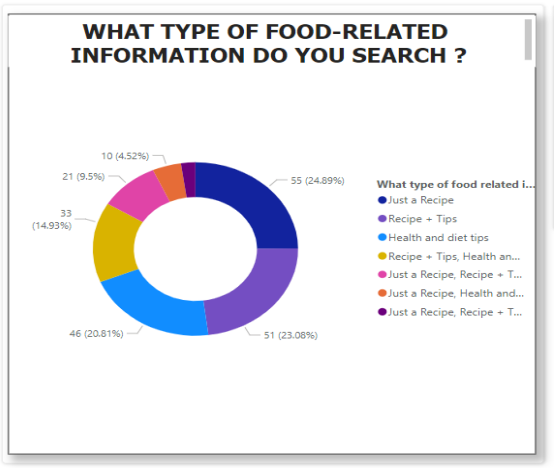

Fig. 12: Visualization for what type of food related information do they search for

In Figure 12, we can see that 24.89% of the respondents search for only a recipe, 54.33% of the respondents search for recipe and tips relating to health and diet and 20.81% of the respondents search for only health and diet tips.

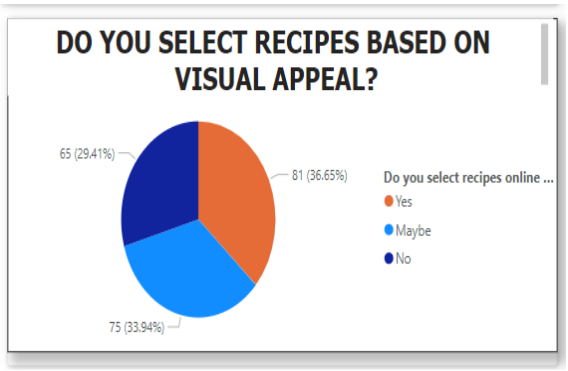

Fig. 13: Visualization for do they select recipes based on visual appeal

In Figure 13, we can see that 36.65% of the respondents select recipes based on visual appeal, 33.94% of the respondents might select a recipe based on visual appeal and 29.41% of the respondents do not select a recipe based on visual appeal.

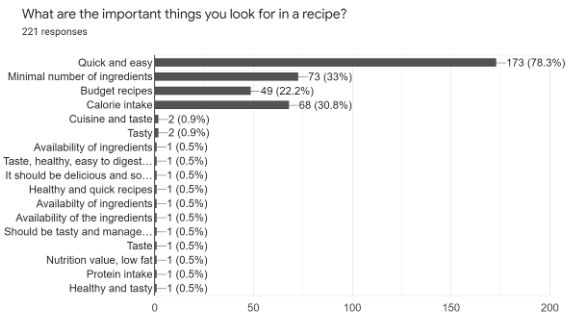

Fig. 14: Visualization for what are the important things they look for in a recipe

In Figure 14, we can see that 78.3% of the respondents want quick and easy recipe, 33% of the respondents want minimal number of ingredients in the recipe, 22.2% of the respondents look for budget recipes, 30.8% of the respondents look for calorie intake in the recipe whereas the remaining look for cuisine and taste, availability of ingredients, healthy, easy to digest, delicious, nutrition value, low fat and protein intake.

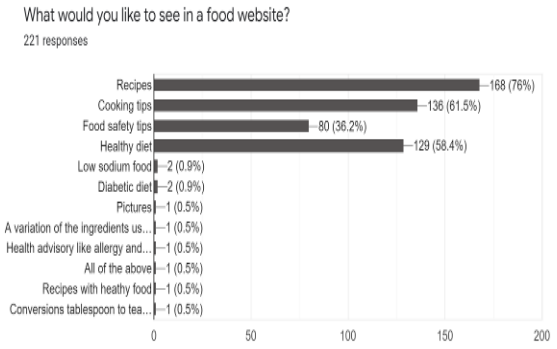

Fig. 15: Visualization for what would you like to see in a food website

From Figure 15, we can see that 76% of the respondents want to see recipes, 61.5% of the respondents want to see cooking tips, 36.2% of the respondents want to see food safety tips, 58.4% of the respondents want to see healthy diet recipes while the rest of the respondents want to see low sodium food, diabetic diet, a variation of ingredients that can be used in daily lives, health advises, substitute ingredients with possible substitutes and conversions (eg: from tablespoon to teaspoon and so on)

II. LITERATURE REVIEW

Archana et al. [1], undertook a research study to create and verify a questionnaire to measure changes in individuals' lifestyle-related behavior during the pandemic times. Overall, the data and results revealed that there was an increase in meal consumption, snacking between meals, and meal quantities.

Barth'elemy et al. [2], studied about the changes in perceived diet quality and cooking methods during the lockdown while comparing it to the previous time period. According to their findings, between March and May 2020, the rigorous COVID-19 lockdown had an influence on the nutrition and culinary behaviours of the French populace. Overall, two out of every five people had changed their eating habits, with identical proportions selecting a more or less balanced diet.

Talissa et al. [3], performed a study to examine and analyze the meal preparation and consumption by university students before and during the COVID-19 pandemic, according to their individual characteristics and cooking skills. Their study's results showed that the pandemic had provided a chance for university students to improve their culinary abilities and frequency of cooking at home with a range of dishes.

Androniki et al. [4] conducted a study to assess obesity in children, adolescents, and young adults during the COVID-19 pandemic, and their findings revealed that COVID-19 restrictions disrupted children, adolescents, and young adults' daily routines, resulting in changes in their eating habits and physical activity.

Berta et al. [5] undertook a study to better understand people' food waste (FW) behaviour during Spain's first COVID-19 lockdown by examining relevant dietary patterns that may have affected FW generation. They said that one trend among residents was to cook more creative meals with leftovers, which 22.5% of those surveyed said they did more.

Valenzise et al. [6] carried out a research to investigate the influence of COVID-19 lockdown on behaviour changes in obese children, as well as the relationship between the new lifestyle and parental instruction. Their research found that the lockdown had a negative impact on the maintenance of a healthy lifestyle among overweight and obese children.

Chika et al. [7] investigated the relationship between household income and meal quality in Japanese school children before, during, and after the COVID-19 pandemic declared a state of emergency. Their findings imply that under the state of emergency, the quality of schoolchildren's meals deteriorated, particularly in low-income homes, because school lunches were not provided.

Raife et al. [8], conducted a research that offers the first known evidence of how Turkish households differed in terms of food management behaviour during the pandemic, providing the groundwork for future segmentation studies in Turkey and elsewhere.

Lakshmi et al. [9] performed a qualitative research during the COVID-19 pandemic and its related lockdowns, to examine the perspectives of Indian home food gatekeepers on meal planning, food purchase, and meal preparation. They discovered that key food gatekeepers had substantial changes in their cooking behaviours compared to pre-pandemic times, including more time spent in the kitchen preparing food and experimenting, increased food literacy in terms of food planning, and an increase in food consumption.

Tina et al. [10] investigated the influence of the COVID-19 pandemic on nutritional and physical activity-related behaviour among school adolescents aged 10–16 years. Their research emphasized the need for novel techniques to encourage adolescents and parents to embrace and follow a healthy lifestyle, particularly during public health emergencies like the COVID-19 epidemic.

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III. MATERIALS AND METHODOLOGY

The Materials and Methodology section is sub divided into 2 sub sections – sub section (A) describes the tool utilized for performing data visualization and sub section (B) that describes the tools, IDEs and packages utilized for building the full stack website.

A. Tool Utilized for performing data visualization

Power Bi application was used to perform data visualizations. The data obtained via Google Forms was saved in a csv (comma separated file), and Power Bi was used to transform the data into cohesive, visually engaging, and interactive insights.

B. Tools, IDE and Packages Utilized for building the full stack website Meal Appeal

The following Tools, IDE and Packages were utilized for building the full stack website Meal Appeal.

- Tools – The tools utilized to build Meal Appeal are further sub divided into subsections – Front end, Animations, Middle ware, Back end, real time communication, database and version control.
  - Database – MySQL Front end – For building the front end of the Meal Appeal website React.js, Bootstrap, Material UI and styled components were used
  - Animations – For animations an open source, production ready motion library from React.js namely – 'Framer Motions' was employed
  - Middleware – Express was used for routing and HTTP middleware was utilized to filter HTTP requests
  - Backend – For the backend Node.js was utilized and for the real time communication Socket.io web socket and Node.js was utilized.
  - Real Time Communication – For real time and bidirectional communication between the client and server, Socket.IO was utilized
  - database has been used in the Meal Appeal website
  - Version Control – To keep a track and for easy maintenance of the code the GitHub platform has been utilized.
- IDE – The Microsoft Visual Studio was utilized for building the research project.
- Packages – The following packages were utilized in the project – material UI, axios, bcrypt, bootstrap, react-bootstrap, chart.js, framer-motions, react-card-flip, react-chartjs-2, react-dom, react-elastic-carousel, react-emoji, react-icons, react-rellax, react-responsive, react-router, react-router-dom, react-scripts, react-scroll, react-scroll-to-bottom, react-slick, react-spring, socket.io-client, styled-components, web-vitals, body-parser, cors, express, multer, mysql, nodemon and socket.io.

IV. FEATURES OF MEAL APPEAL WEBSITE

There are 2 parts to the Meal Appeal Website – the User side and the Administrator side. The features for each section are described below:

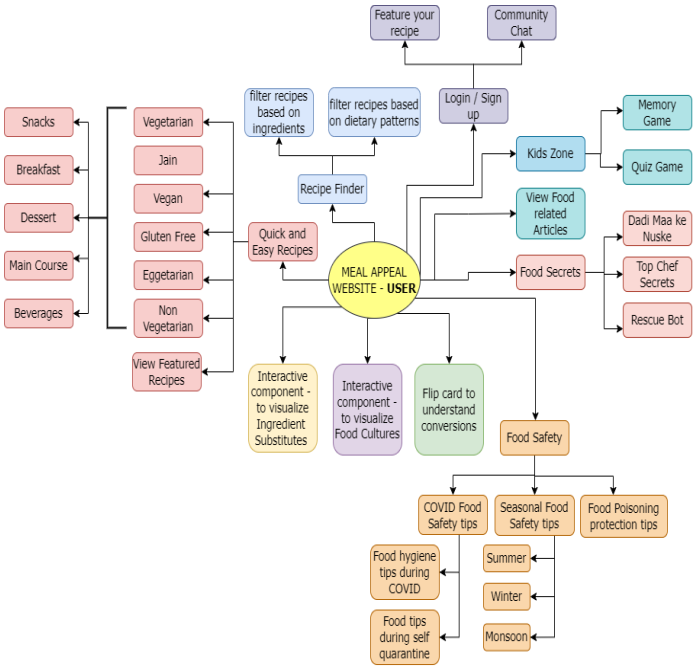

Fig. 16: User Side Features

Figure 16 shows the user side features. A detailed description is given below

- Recipe Finder – This feature helps to filter out recipes based on ingredients or based on dietary patterns. This has been done with the help of a recipe search API [13].
  - Filter recipes based on ingredients – In this feature, the user can type any ingredient and the recipe with that ingredient is shown to the user.
  - Filter recipes based on dietary patterns – In this feature, the user can filter recipes based on different dietary patterns such as – low calorie, low sodium, keto diet, low carb, low fat, diabetic, high protein, high fiber and one pot meal
- Quick and Easy Recipes – This feature provides the user with various quick and easy recipes for a variety of different diets such as – Vegetarian, Jain, Vegan, Gluten Free, Eggetarian and Non-Vegetarian. Further there are various options to view recipes in different diet categories such as – Snacks, Breakfast, Dessert, Main Course and Beverages. For each Recipe, the name of the recipe, the time to prepare it, the number of servings possible, ingredients, steps to prepare it and a picture of the recipe is displayed. The recipes in this section are retrieved for the MySQL database.
- View featured recipes – There is also an option provided to the user to view featured recipes showcased by other users who have an account on Meal Appeal. Once the user creates an account on Meal Appeal, they have an option to feature their recipe, they can enter the details of their creative recipe and submit the recipe. The recipe then gets stored in the database. Further in the 'View featured recipes' section the recipes get retrieved from the database

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and are seen on the Meal Appeal platform. This gives the users a platform to showcase and share their creativity, whereas the other users can learn from them and try out new recipes.

- Interactive Component: to visualize ingredient substitutes – This feature is an interactive component. There is a 3d kitchen model and different food items are placed across the kitchen. The user can hover over on any food item to view the name of the food item and on the left side can view the substitute for the food item, with a detailed description of the steps to prepare the substitute.
- Interactive Component: to visualize food cultures – This feature is an interactive component that allows the users to know the famous cuisines of different states in India. There is a map of the country India and on hovering on any state the user can know the top 10 famous cuisines of that particular state.
- Flip cards to understand conversions – This feature allows the user to understand the basic conversions between tablespoon, teaspoon and a cup. For any conversion the user can flip the card and see the conversion.
- Food Safety rules – This feature allows the user to become aware of the various food safety rules. There are options given to the user such as to view COVID food safety tips, view seasonal food safety tips and view tips to protect from food poisoning. The tips are displayed in the form of accordions and the user can hover to expand and read the tips.
  - COVID food safety tips – This is further subdivided to viewing Food hygiene tips during covid and Food tips during self-quarantine
  - Seasonal Food Safety tips – This is further subdivided to viewing safety tips for summer season, winter season and monsoon season.
- Food Secrets – This feature allows the user to view tips and tricks provided by the older adults, view the top chef secrets and chat with a chatbot. The tips and tricks are displayed in the form of a carousel. The chatbot has been implemented using the Dialogflow API [12].
- View Food Related Articles – This feature provides the user the option to view food related articles that have been retrieved through an API [14]. The user can further filter out results by typing keywords in the search bar provided.
- Kids Zone – 'Kids Zone' section in the Meal Appeal website aims at teaching kids easy recipes in an interactive and fun way through games. There are 2 games for the kids – Memory game and a quiz game.
  - Memory Game – In the memory game different cards with the photo of the ingredients to make the recipe are given. The number of cards is double the number of ingredients, such that 2 cards have the photo of the same ingredient and the user needs to match the cards with the same photo. On matching all the cards, the recipe is unlocked. Every time we open 2 cards it increments the moves by one. To shuffle the cards, the Fisher Yates shuffle algorithm is utilized and every time we refresh the page it generates a new order of the shuffled cards. There are 5 different levels in the game and as the levels of the game increase, the number of ingredients in the recipe also increase. On completion of each level the recipe is displayed and the total moves taken to solve that level is also displayed.
  - Quiz Game – This is a simple multiple choice quiz game where to unlock a recipe the user will have to solve the multiple-choice question and choose an answer. On solving each question, the correct answer is displayed. On solving the set of questions, the final score and recipe is displayed. There are 5 different levels in the game.
- Login / Sign up – There are a few features given to the users who Sign up and create an account in the Meal Appeal website. To create an account the user can click on the 'Sign Up' button. The user can fill in all the details for the account and this information gets stored in the MySQL database. The passwords of the users are salt hashed and stored in the database which handles the security perspective. To salt hash the passwords a third-party middleware bcryptjs [15] was utilized. Once the user has created their account, they can login to their account to leverage the features such as community chat and getting a platform to feature their recipe.
  - Community Chat – The community chat feature allows people to communicate real time. The users can join different rooms and communicate with people who are currently online. There are also other features such as the user can type emojis, there is auto scrolling in message and there is also a tab available to the users to view the people who are currently online in the group. The administrator also notifies if someone has joined the room or left the room.
  - Feature their recipe – This allows the user to write details about their recipe hence giving them a platform to showcase their creative recipes. The users can fill up the form and on submitting the form the details get stored in the MySQL database.

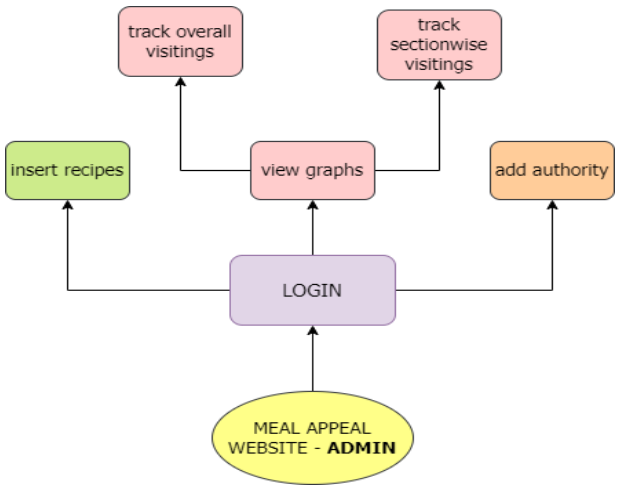

Fig. 17: Administrator (Admin) Side Features

Figure 17 shows the administrator (Admin) side features. A detailed description is given below:

- Login – There are a few features given to the administrator but the administrator needs to login into their account to access them. On logging in there are options such as viewing the graphs, inserting new recipes to the Meal Appeal website and adding other authorities.

- Track overall visiting in the form of graphs - This facility allows the administrator to visualize and analyze which dietary category got the most views and clicks and hence the administrator can insert more recipes in the category that is most viewed.
- Track section wise visiting in the form of graphs – This is a feature for the administrator to visualize the graphs giving a more in-depth visualization. The data is further segregated according to various sub categories and it helps the administrator to visualize and analyze which sub category has got the most views and clicks and hence the administrator can insert more recipes in that specific sub category.
- Insert new recipes – This feature allows the administrator to insert new recipes under the 'Quick and Easy Recipes' Section.
- Add an authority – This allows the administrator to add other authorities to view the graphs and insert new recipes.

V. SCREENSHOTS OF THE MEAL APPEAL WEBSITE

This section displays the screen shots of the Meal Appeal website.

A. User side Features

The user side screen shots are as follows:

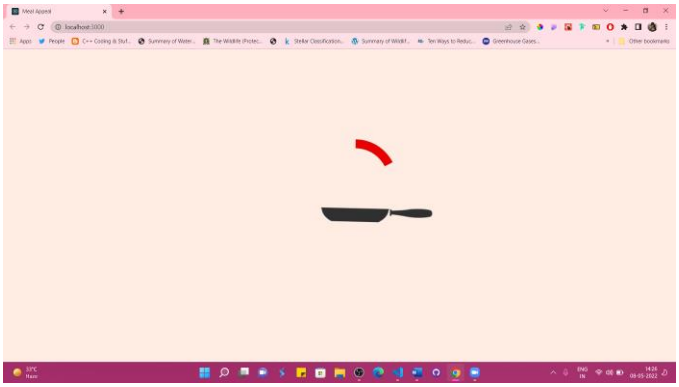

Fig. 18: Loader Screen

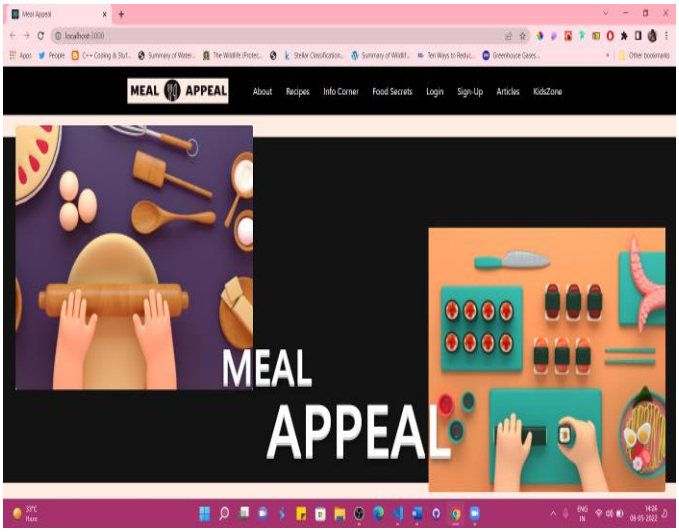

Fig. 19: Homescreen

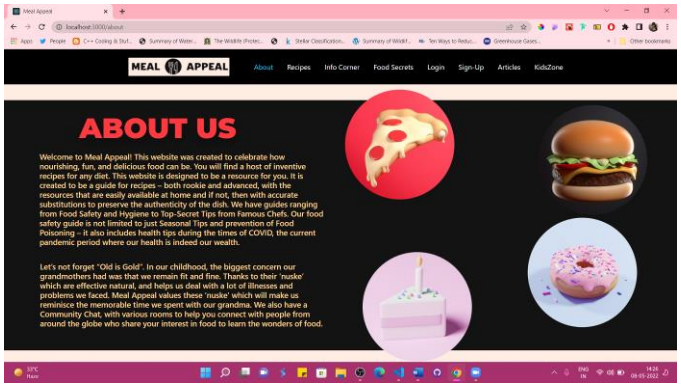

Fig. 20: About Us screen

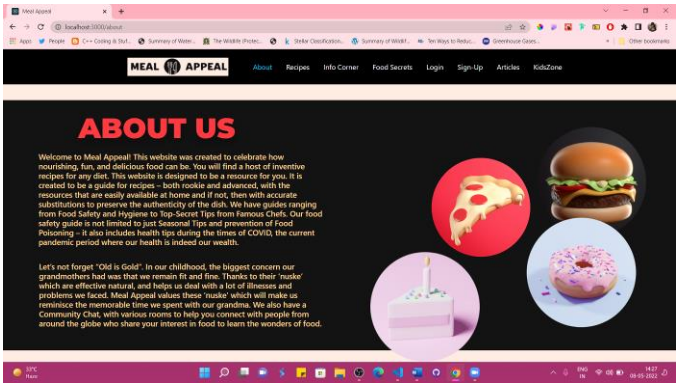

Fig. 21: Images are draggable and playable

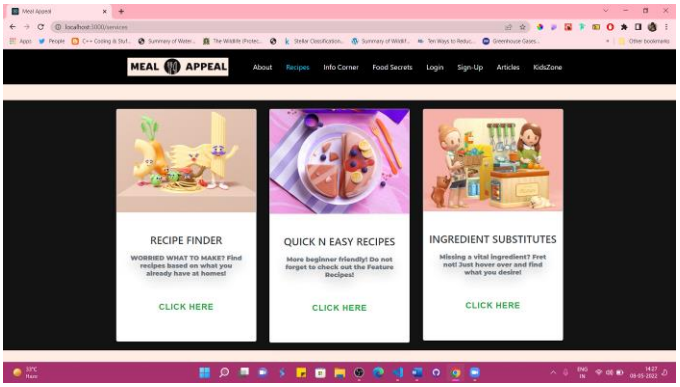

Fig. 22: Feature Selection Screen

Fig. 23: Different dietary filter options available

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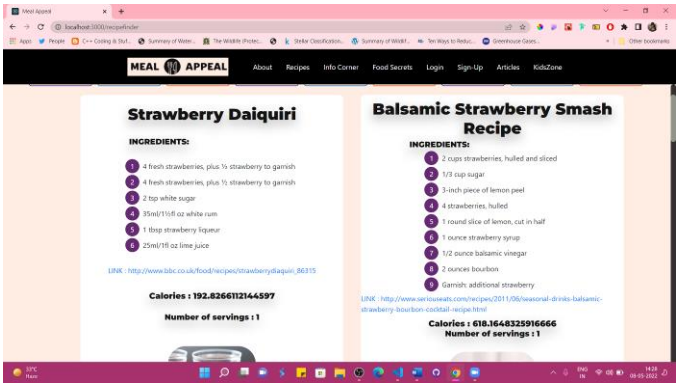

Fig. 24: Recipe results for the ingredient ‘strawberry’

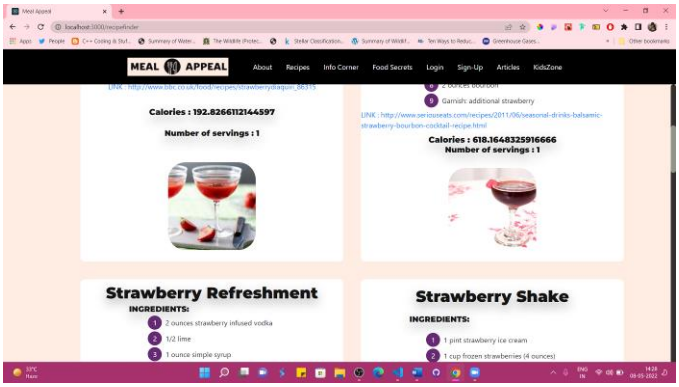

Fig. 25: Recipe results for the ingredient ‘strawberry’

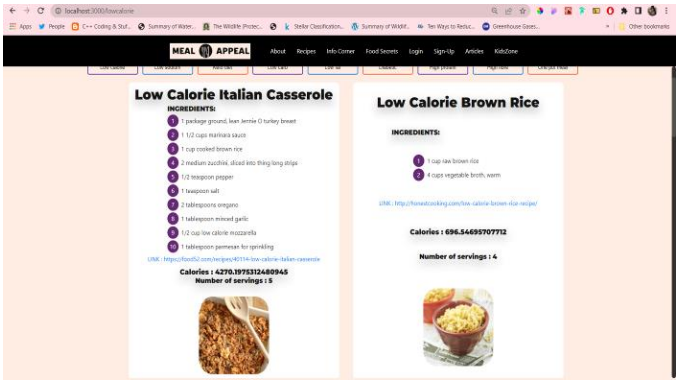

Fig. 26: Recipe results for the ‘low calorie’ dietary pattern

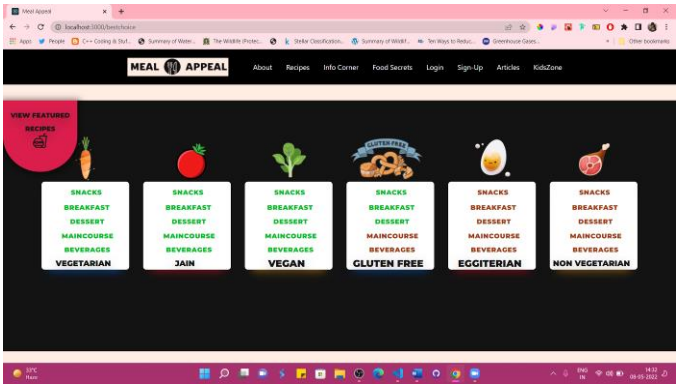

Fig. 27: Different categories and sub categories under the different diets

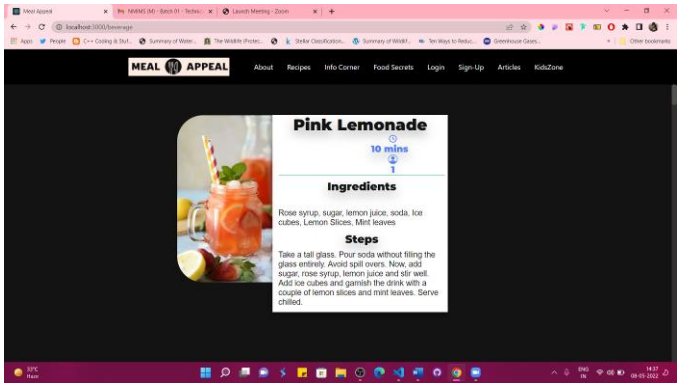

Fig. 28: Recipe under the Vegetarian – Beverage Section

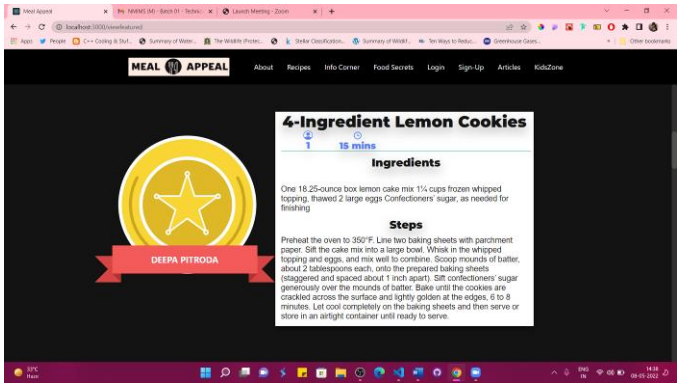

Fig. 29: A User’s Featured Recipe

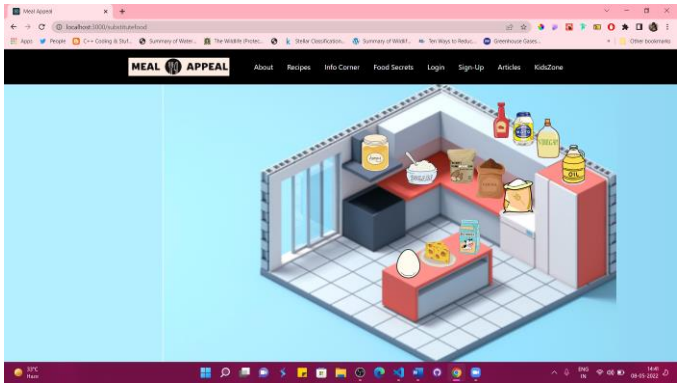

Fig. 30: The 3d kitchen image with different ingredients to view their substitutes

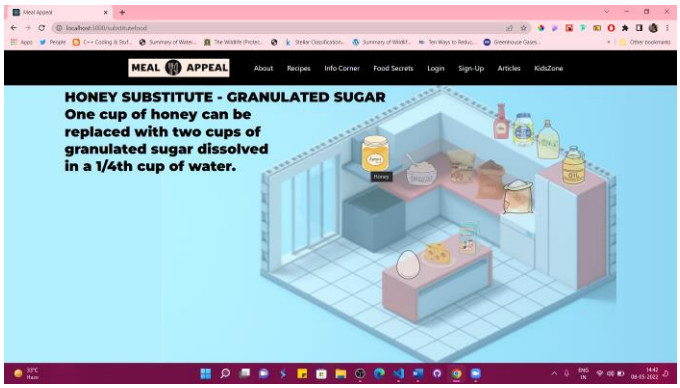

Fig. 31: Hovering over the ingredient to find its substitute

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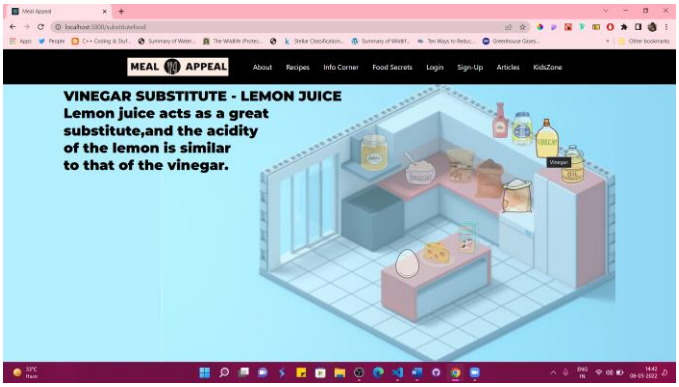

Fig. 32: Hovering over the ingredient to find its substitute

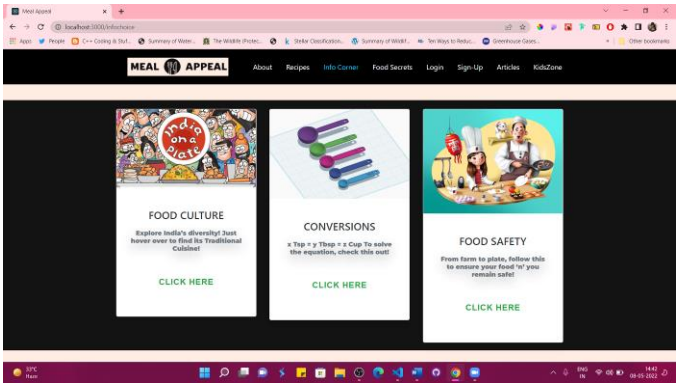

Fig. 33: Feature Selection Screen

Fig. 34: Hovering over the state in the map of India to know the famous cuisines

Fig. 35: Hovering over the state in the map of India to know the famous cuisines

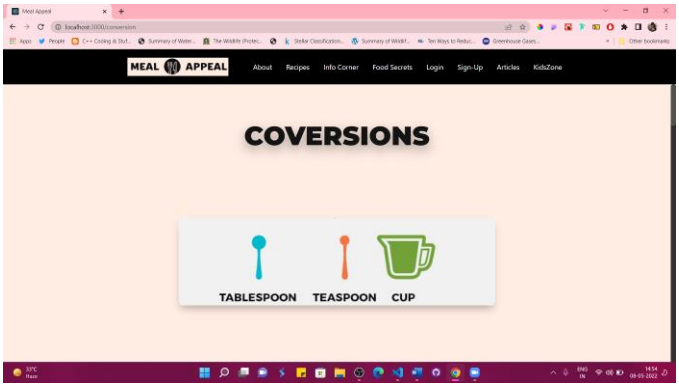

Fig. 36: Screen to view the conversions

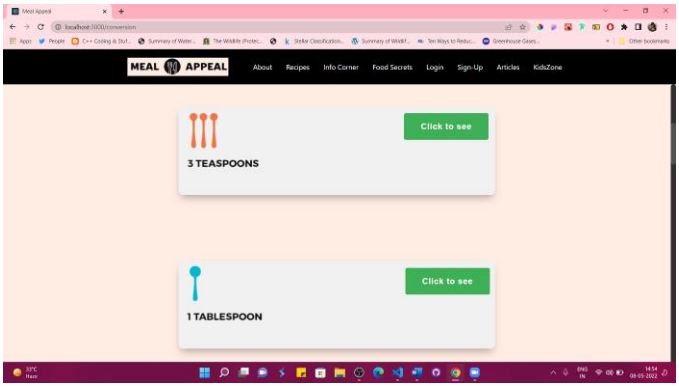

Fig. 37: Differnet options provided to user

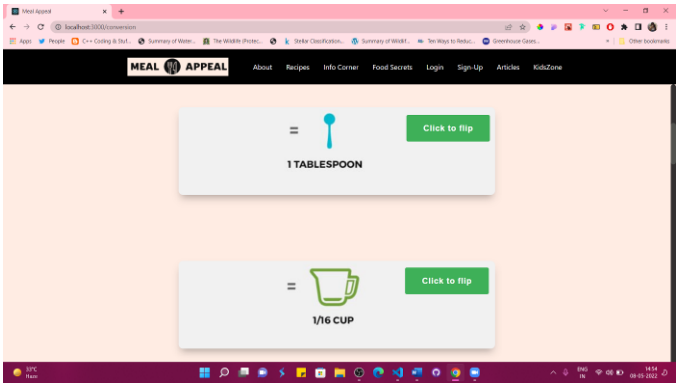

Fig. 38: User can flip the card to see the conversion

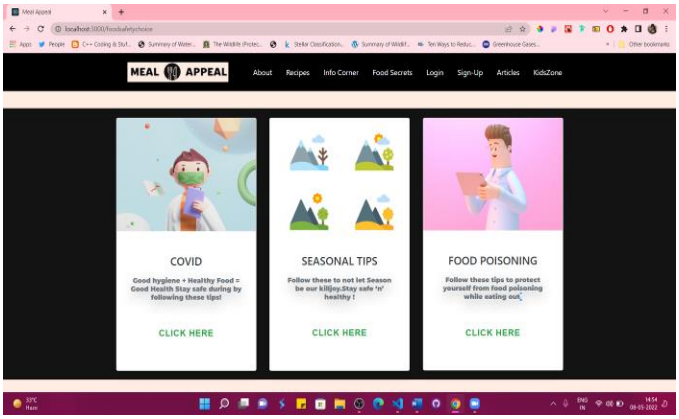

Fig. 39: Selection Screen

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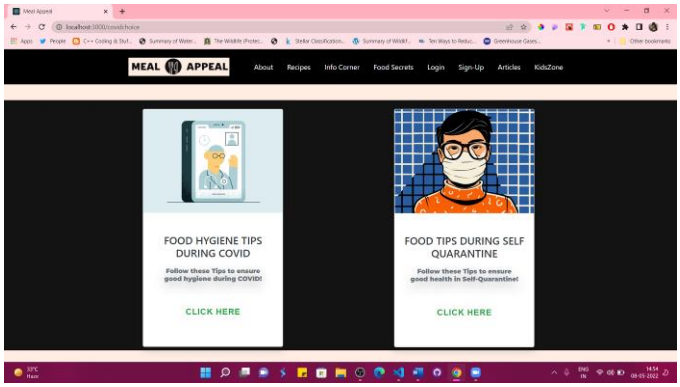

Fig. 40: Selection Screen

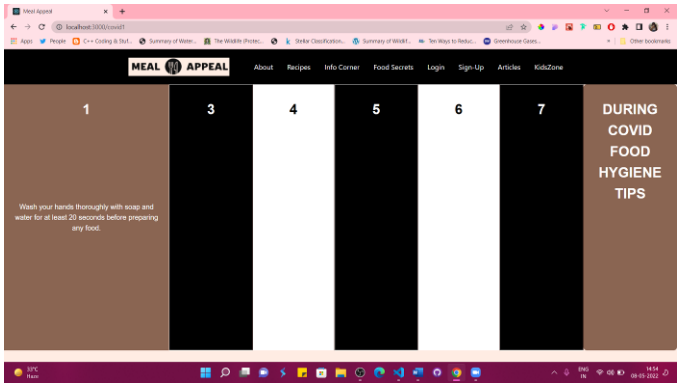

Fig. 41: Tips displayed in the form of accordian for 'COVID Food Hygiene'

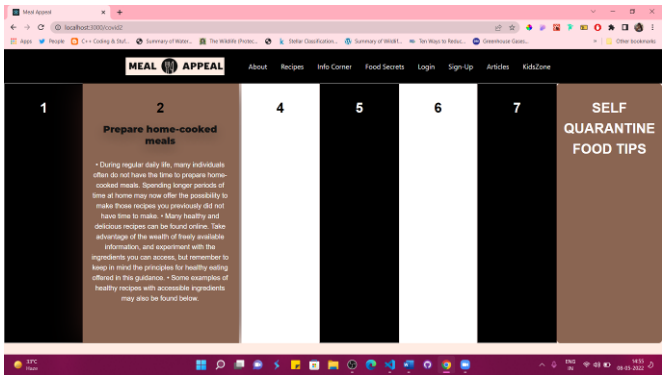

Fig. 42: Tips displayed in the form of accordian for 'Self Quarantine Food tips'

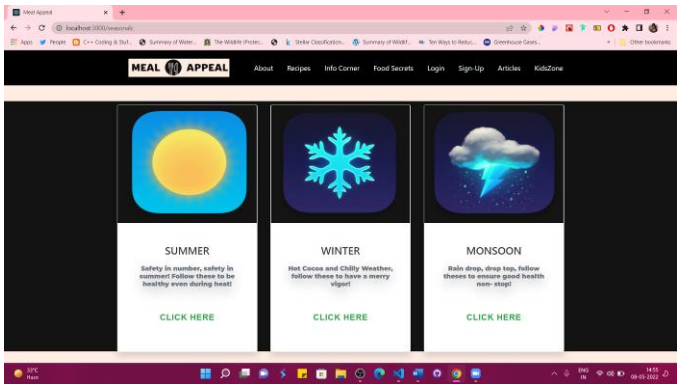

Fig. 43: Selection screen

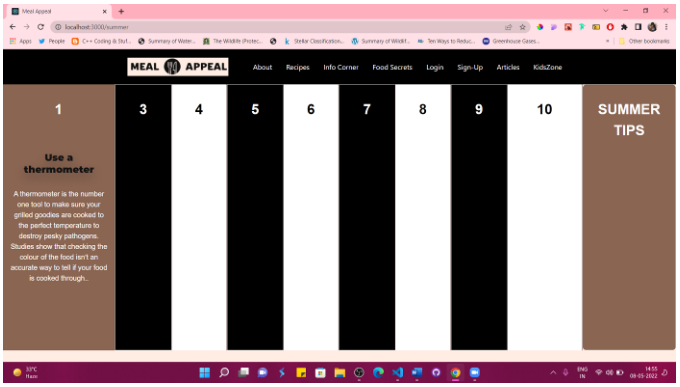

Fig. 44: Tips displayed in the form of accordian for 'Summer Food Tips'

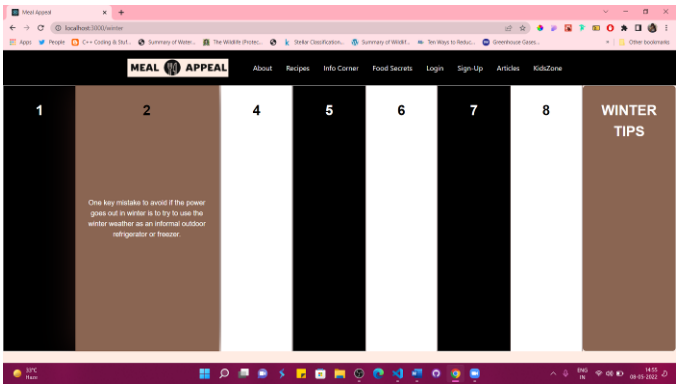

Fig. 45: Tips displayed in the form of accordian for 'Winter Food Tips'

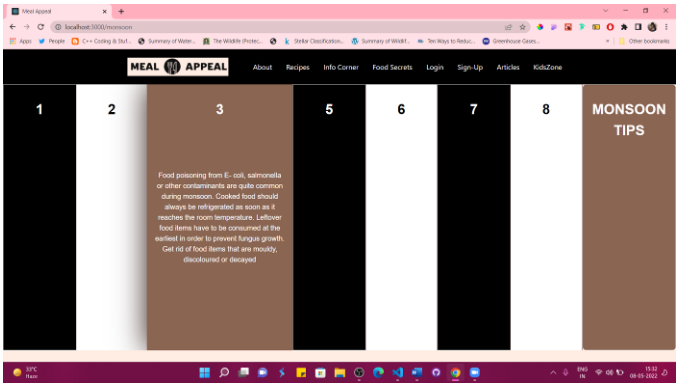

Fig. 46: Tips displayed in the form of accordian for 'Monsoon Food Tips'

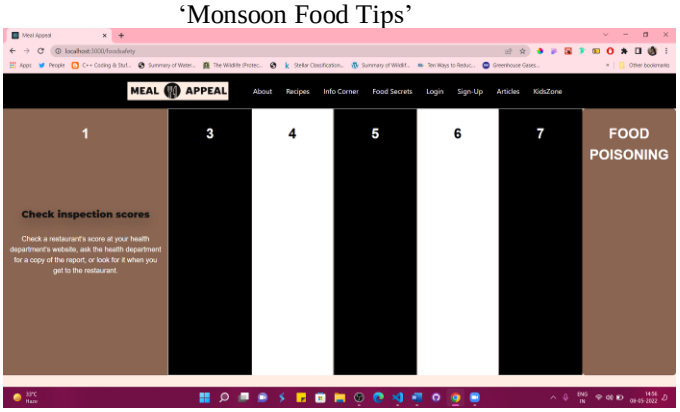

Fig. 47: Tips displayed in the form of accordian for 'Food Poisoning protection tips'

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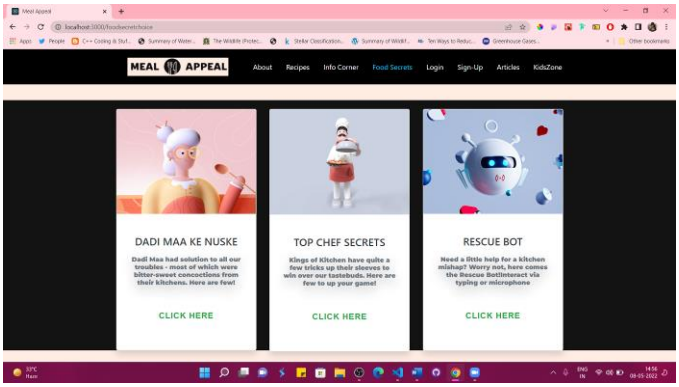

Fig. 48: Selection Screen

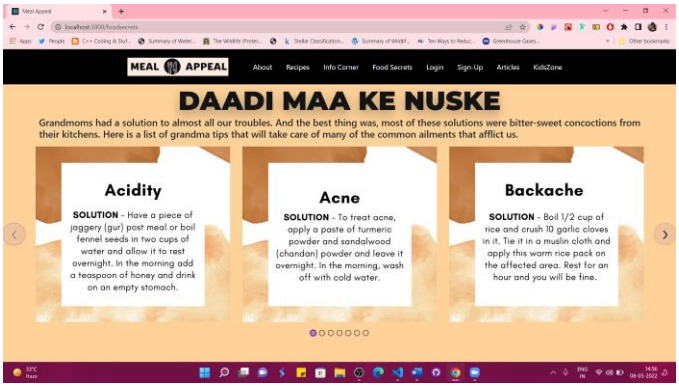

Fig. 49: Long-aged, old home remedies displayed in the form of carousel

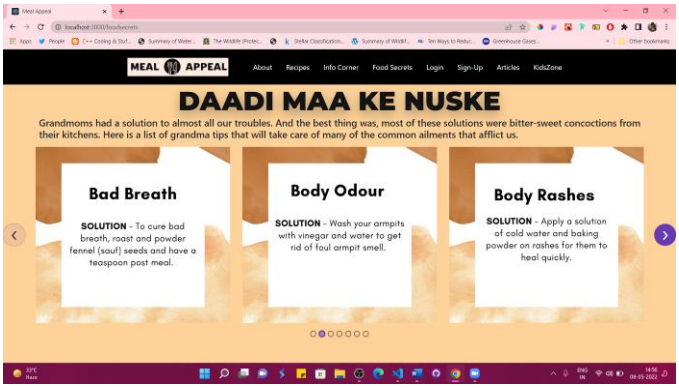

Fig. 50: Long-aged, old home remedies displayed in the form of carousel

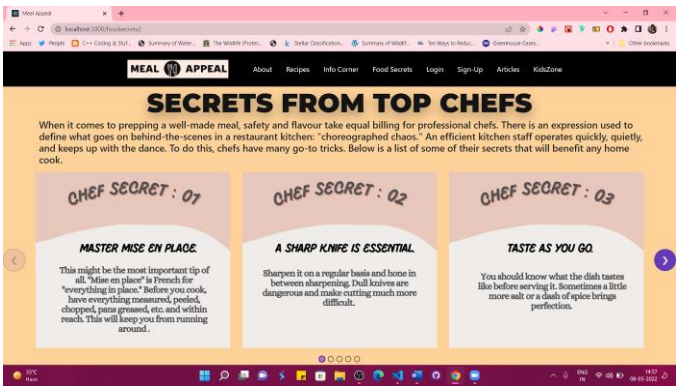

Fig. 51: Some Top Chef secret cooking tips displayed in the form of carousel

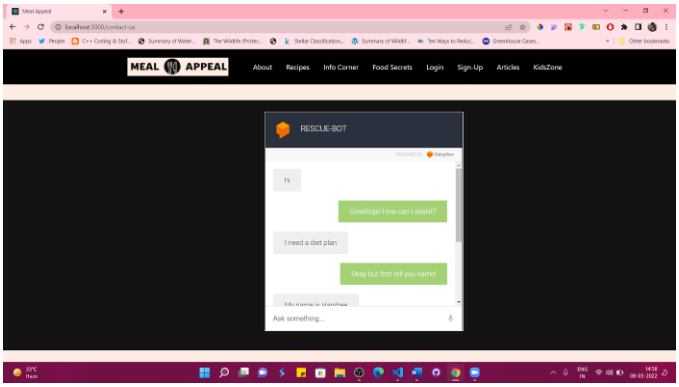

Fig. 52: Screen shot of a chat with Rescue Bot

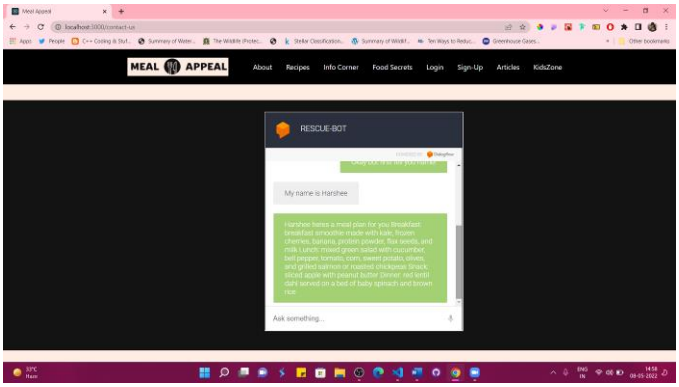

Fig. 53: Screen shot of a chat with Rescue Bot

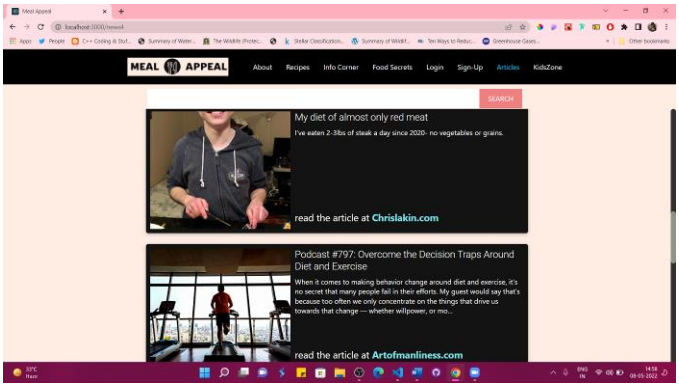

Fig. 54: Screen shot of the articles retrived relating to diet

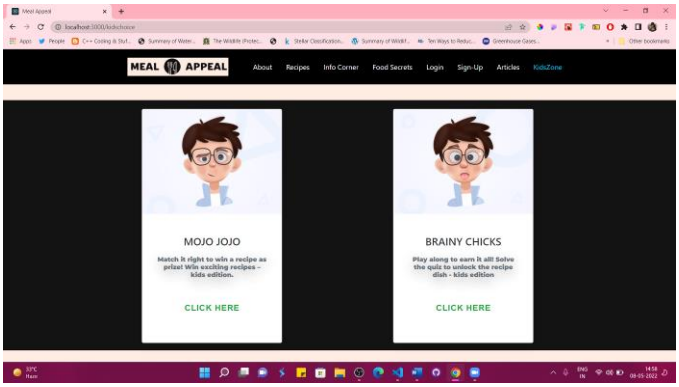

Fig. 55: Selecting the game

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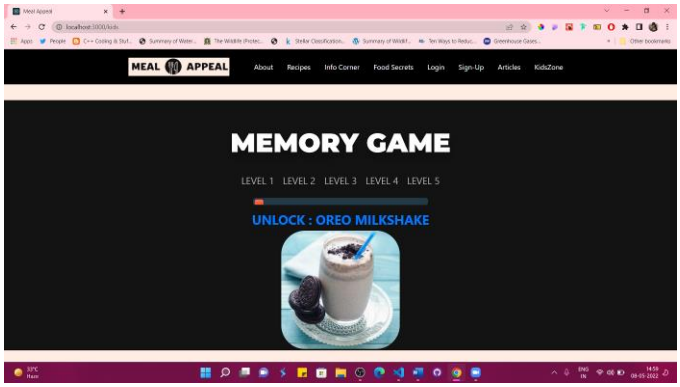

Fig. 56: Memory game Level 1

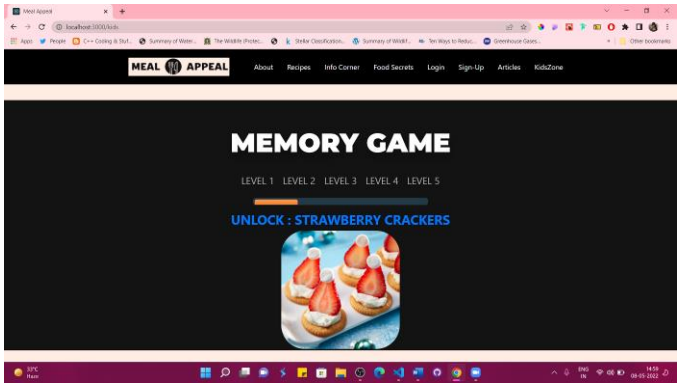

Fig. 57: Memory game Level 2

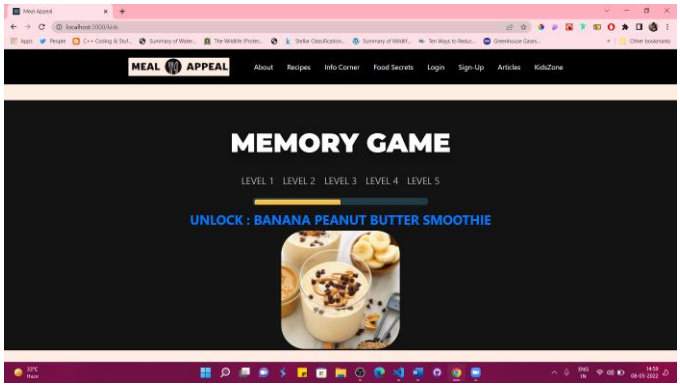

Fig. 58: Memory game Level 3

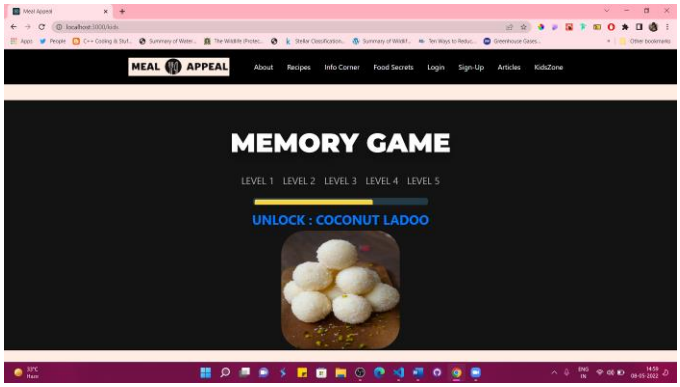

Fig. 59: Memory game Level 4

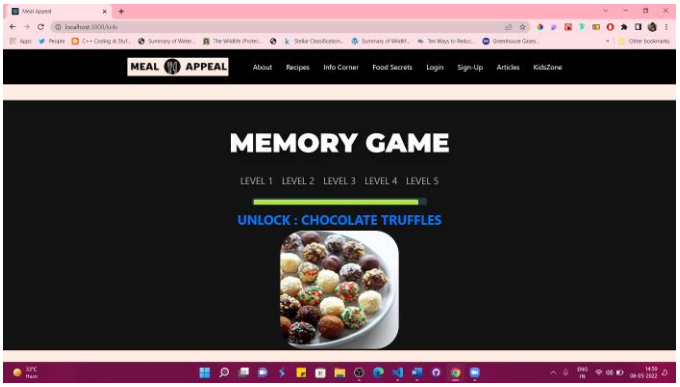

Fig. 60: Memory game Level 5

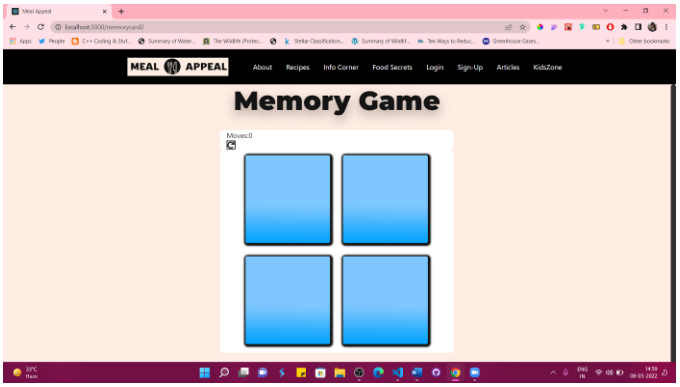

Fig. 61: Cards displayed in the Memory game

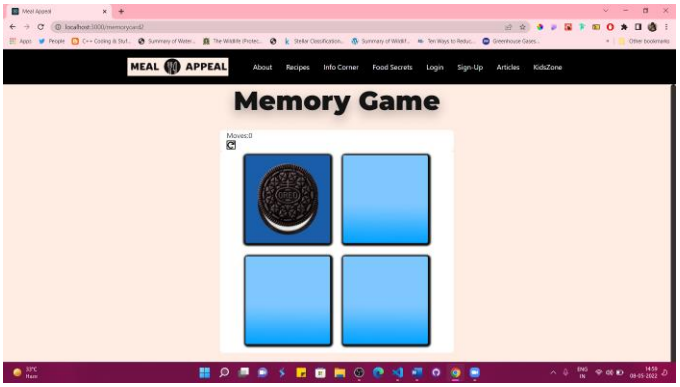

Fig. 62: On clicking a card in the Memory game

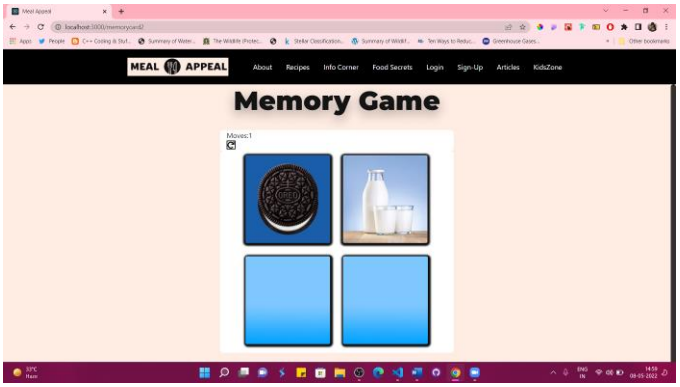

Fig. 63: If two cards do not match they flip again in the Memory game

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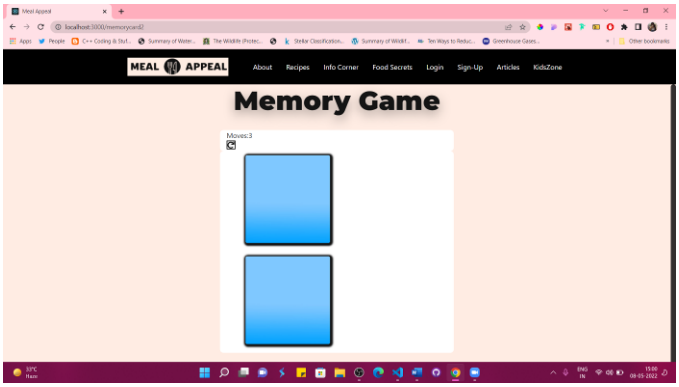

Fig. 64: If two cards match, the cards are removed from the screen in the Memory game

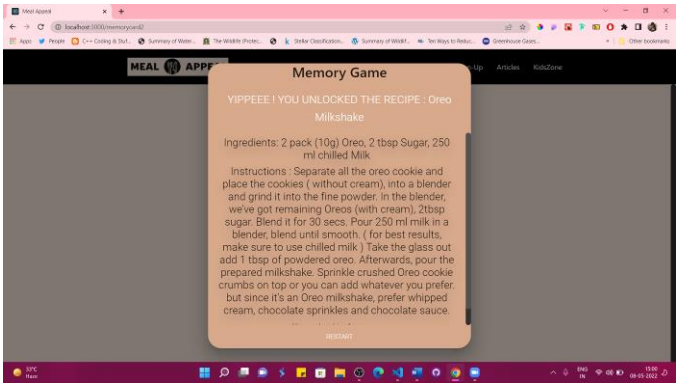

Fig. 65: Recipe and score displayed in the Memory game

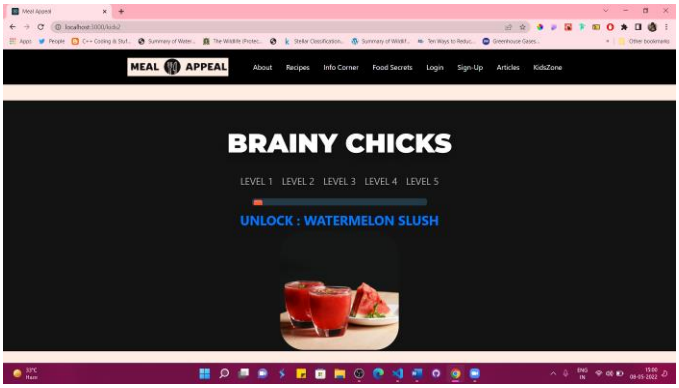

Fig. 66: Level 1 in the Brainy Chicks Game

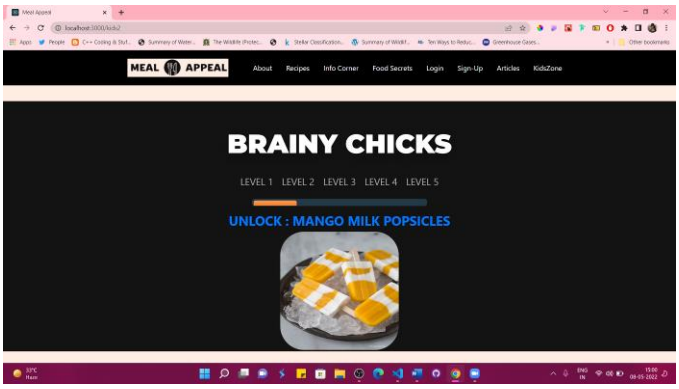

Fig. 67: Level 2 in the Brainy Chicks Game

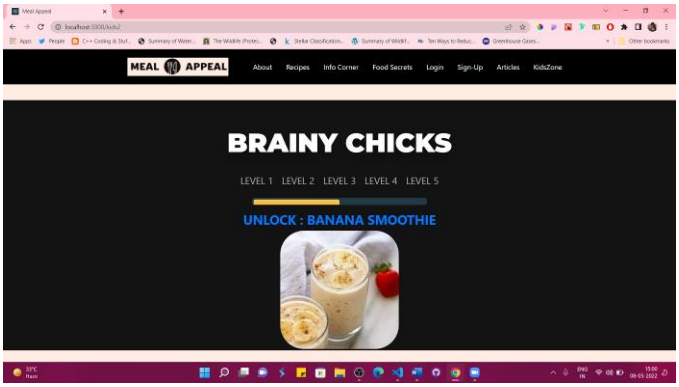

Fig. 68: Level 3 in the Brainy Chicks Game

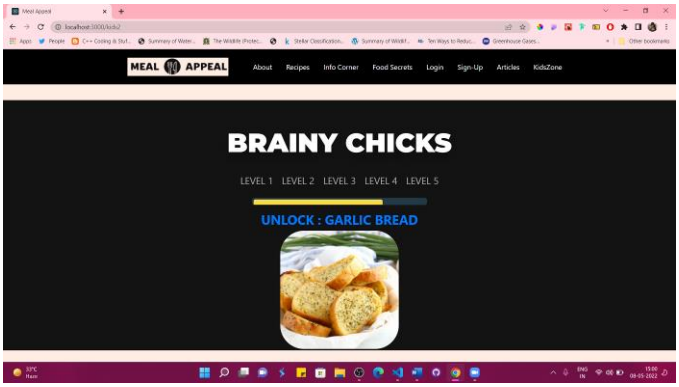

Fig. 69: Level 4 in the Brainy Chicks Game

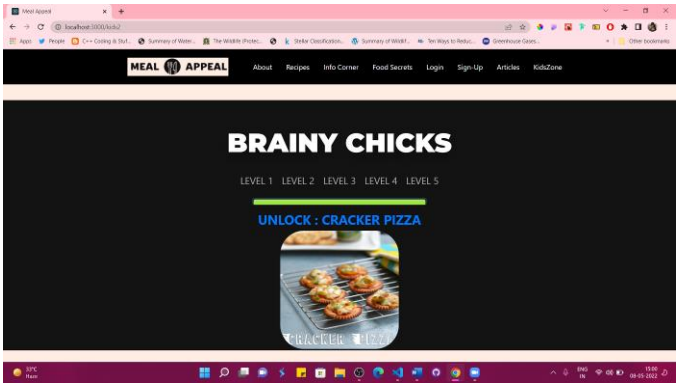

Fig. 70: Level 5 in the Brainy Chicks Game

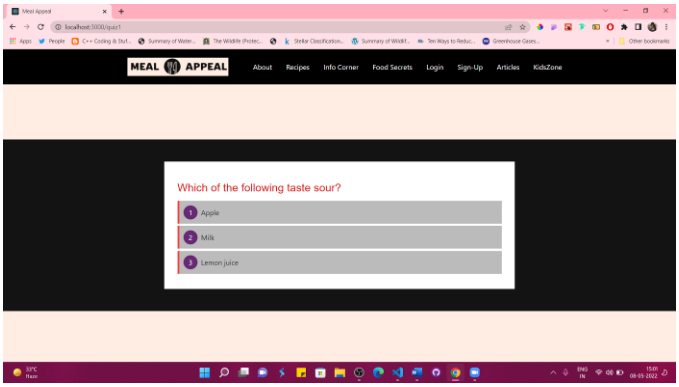

Fig. 71: Question in the Brainy Chicks Game

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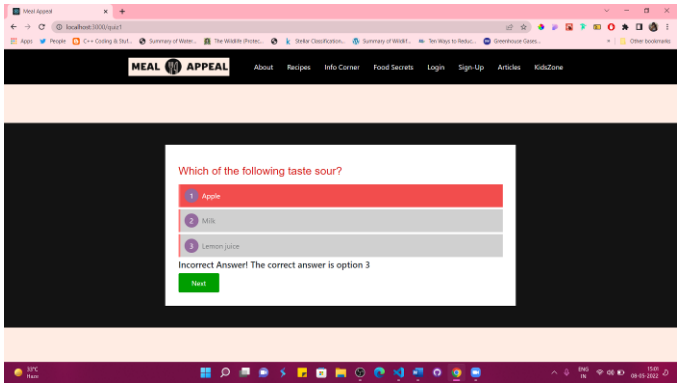

Fig. 72: If the answer is incorrect it is displayed in red and the correct answer is also displayed the Brainy Chicks Game

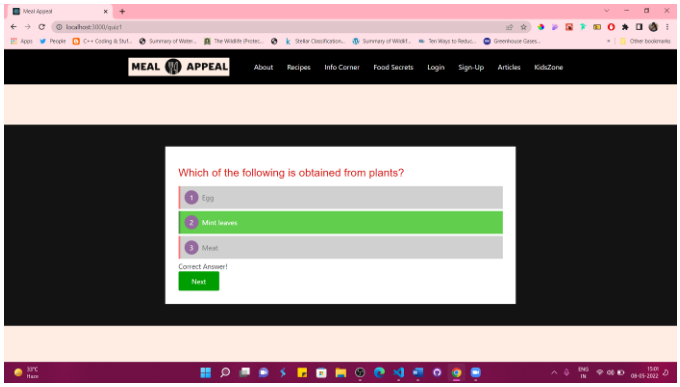

Fig. 73: If the answer is correct it is displayed in green color in the Brainy Chicks Game

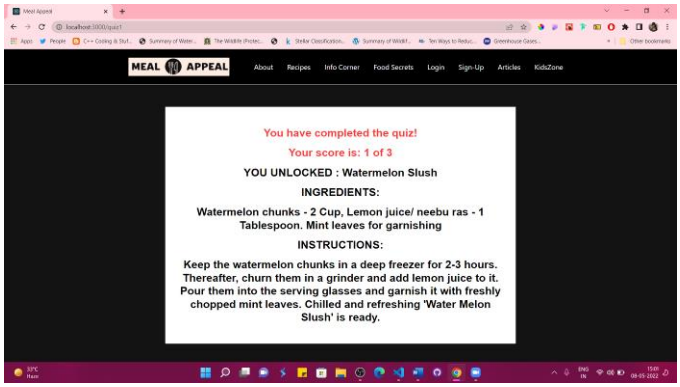

Fig. 74: On completing the game the recipe and score is displayed in the Brainy Chicks Game

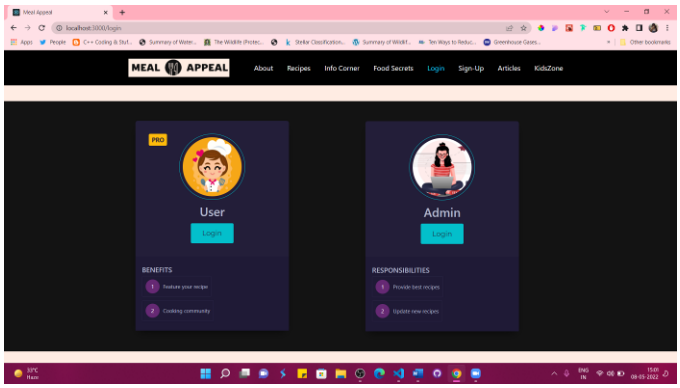

Fig. 75: Selection screen for logging in

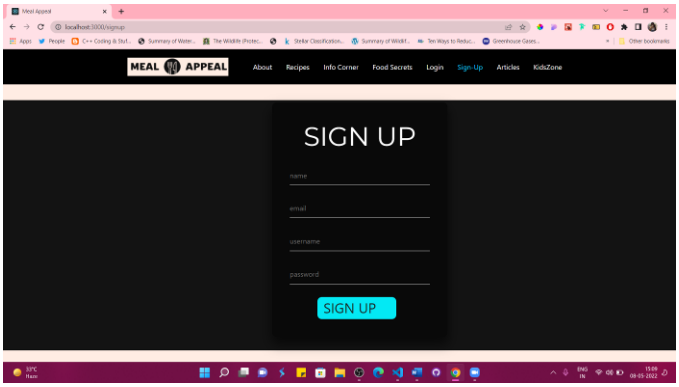

Fig. 76: User Sign Up screen

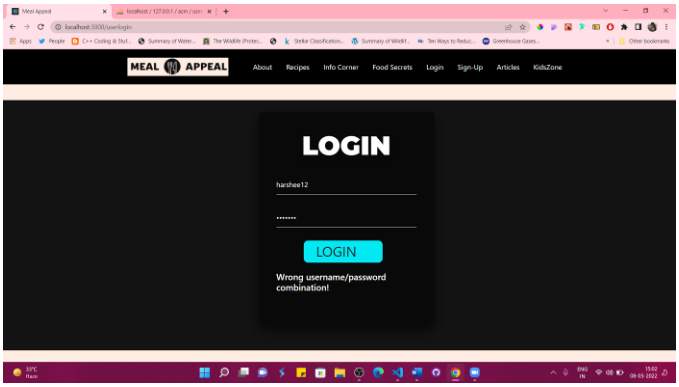

Fig. 77: User Login Screen

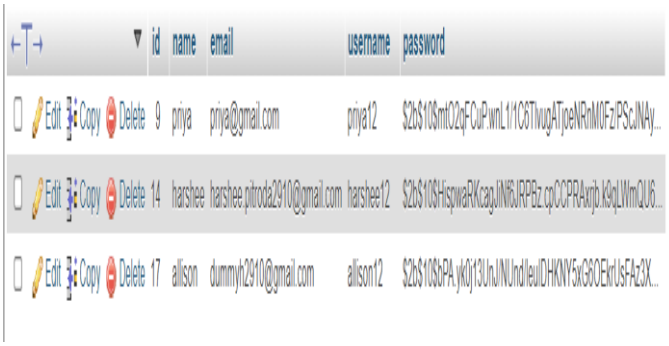

Fig. 78: User database and a snippet of the password being salt hashed and stored

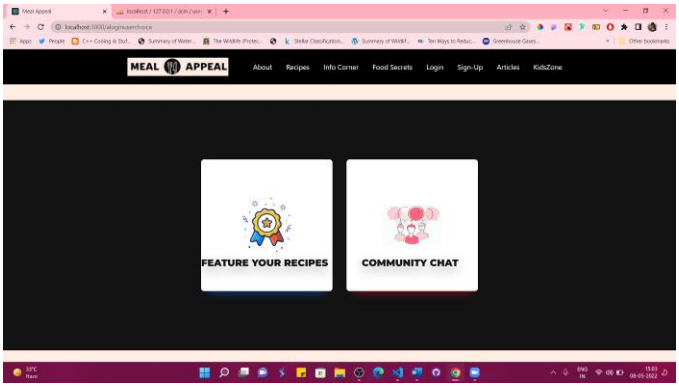

Fig. 79: User Selection Screen on logging in

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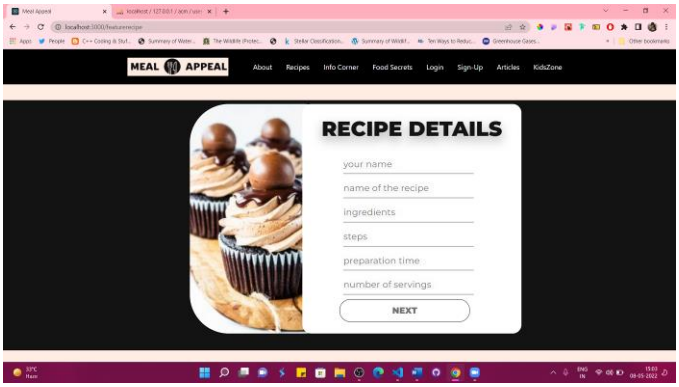

Fig. 80: Screen to enter details for their unique recipe

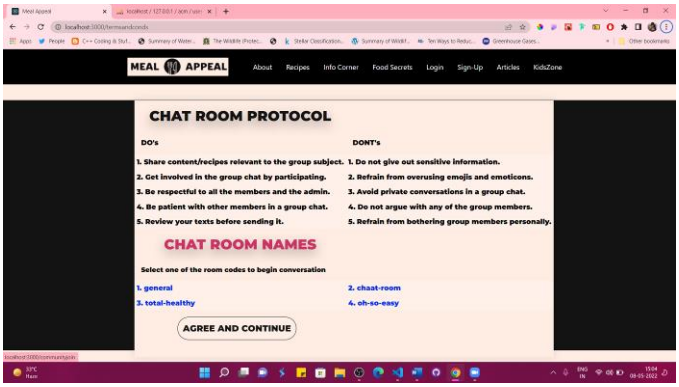

Fig. 81: Screen to view the chat room protocols

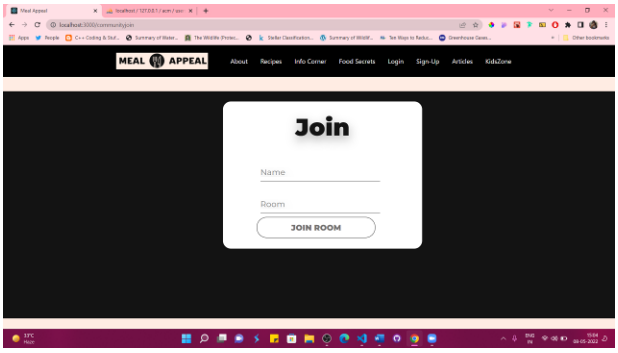

Fig. 82: Screen to enter details to join the chat room

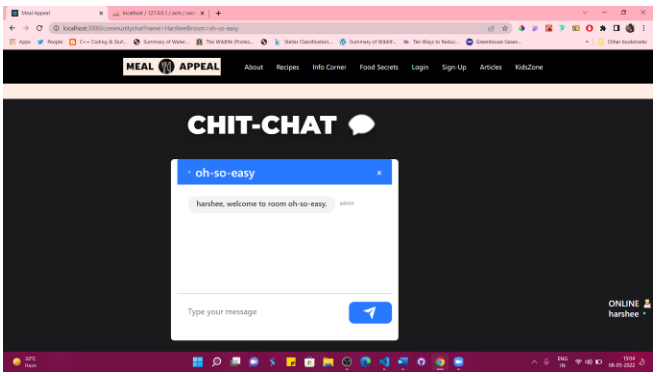

Fig. 83: Screen displaying the administrator's message and online tab in the community chat feature

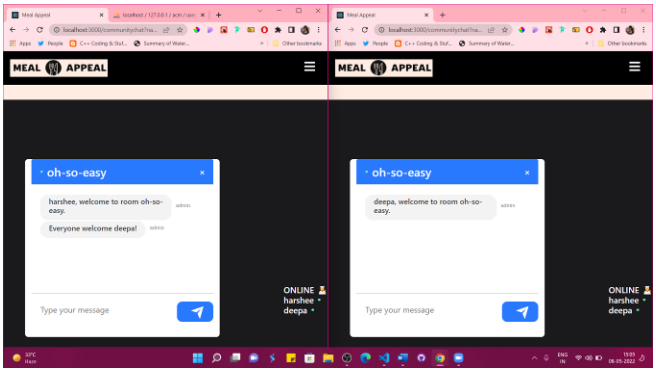

Fig. 84: Screen displaying the administrator's message on another user joining in and online tab in the community chat feature

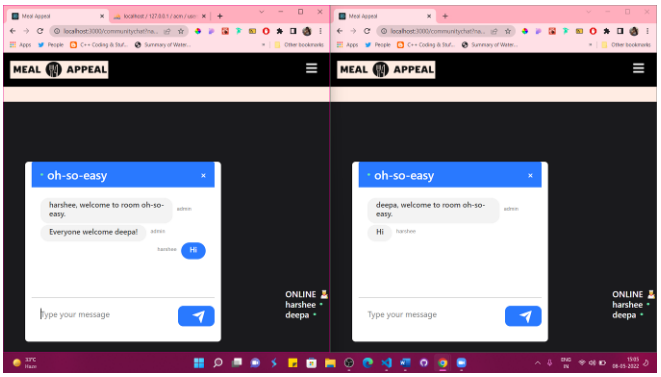

Fig. 85: Displays users' chatting

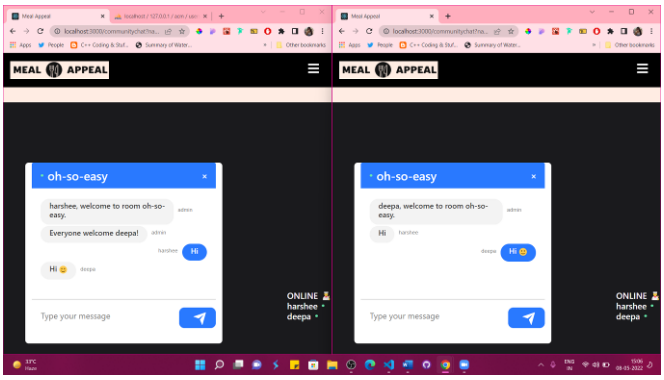

Fig. 86: Displays users' chatting using emojis

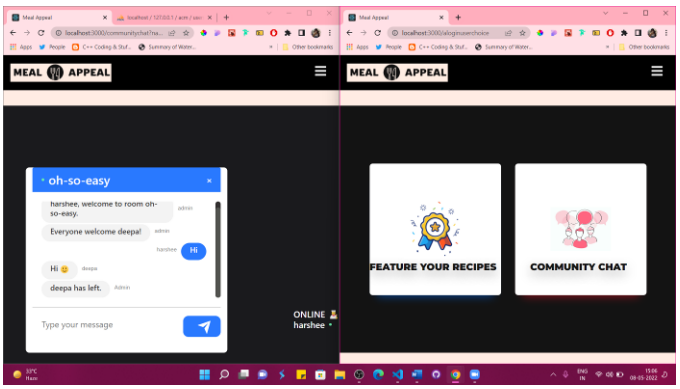

Fig. 87: Displaying the administrator's message on user leaving the chat room

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B. Administrator (Admin) side Features

The Administrator (Admin) side screenshots are as follows:

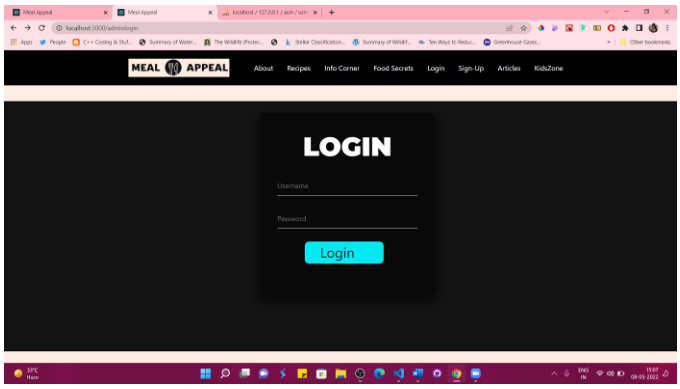

Fig. 88: Displaying the Administrator login screen

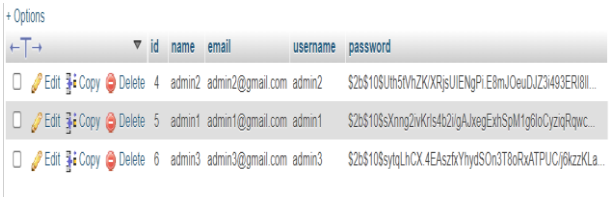

Fig. 89: Administrator database and a snippet of the password being salt hashed and stored

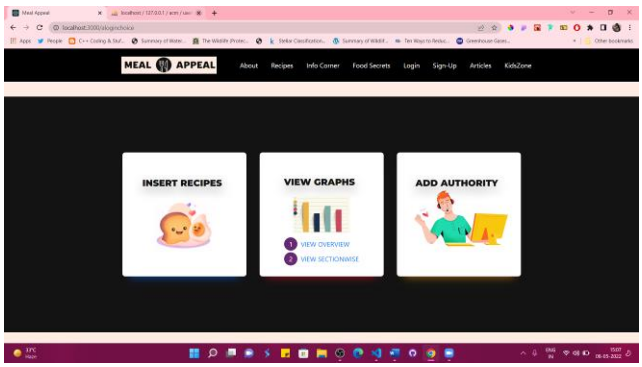

Fig. 90: Administrator selection screen

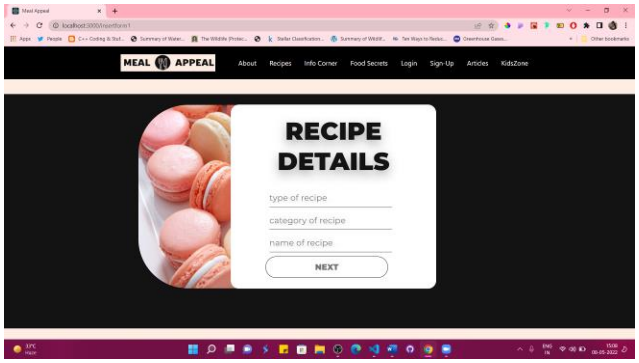

Fig. 91: Screen to enter recipe details used by an Administrator

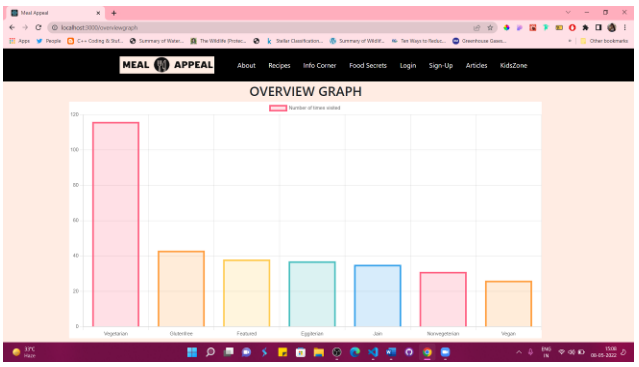

Fig. 92: Screen to view overview graph for the Administrator to visualize which diet category gets more views and clicks

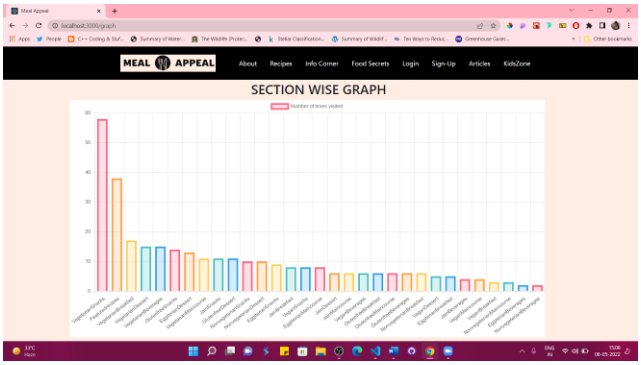

Fig. 93: Screen to view section wise graph for Administrator to visualize which diet category and sub category gets more views and clicks

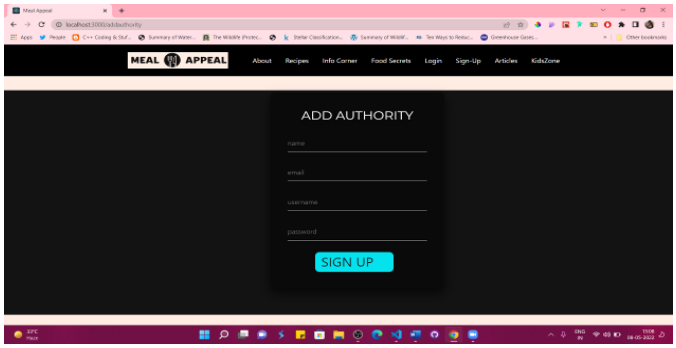

Fig. 94: Screen displaying the add an authority feature

VI. CONCLUSION

In this research project, I created Meal Appeal, an interactive web application that acts as a one-stop destination for all meals. Meal Appeal is a feature-rich, fully functional full stack website. Meal Appeal is a platform that explores cooking from several angles. Meal Appeal makes home cooking easier and more enjoyable by offering a variety of features such as - showcasing beginner-friendly curated recipes based on different dietary patterns, learning more about ingredients through interactive components, gaining knowledge to understand more about diet, dietary tips, and tracking visits category wise to improve the website's content.

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