CS301

FINAL REPORT

4epicure - Recipe and Meals mobile application

Introduction:

EPICURE: *A person who takes particular pleasure in fine food and drink.*

"4epicure" is the name of our team and our innovative recipe app. Our application aims to serve as the ultimate destination for all epicures by providing tourists, students, travelers, and any common person with information about the rich and culturally diverse food of a particular region, including its nutritional information. The app also features a unique search option for recipes and meals, allowing users to obtain detailed information about any recipe without needing to browse the internet or visit other sources.

Additionally, "4epicure" offers users several unique features, such as integration with ChatGPT, YouTube tutorials, and AI voice assistants. The app also allows users to navigate through screens by shaking their phones and scroll screens without touching the screen using smart sensors configuration. These features enable users to compare nutritional information for each recipe, among other functionalities.

Moreover, our application provides customers with access to dishes that may have long histories and are lost in modern cuisine. By utilizing our app, users can

gain a deeper appreciation of traditional cuisine and explore new culinary experiences.

In summary, "4epicure" is a comprehensive recipe app designed to enrich the food experience of its users.

Background:

As food tourism and culinary experiences continue to gain popularity among consumers, the demand for applications that provide easy access to information on local cuisine, nutritional information, and recipe details has also increased. The lack of a comprehensive platform that offers all of these features in one place prompted our team to develop the "4epicure" app.

Our goal was to create an application that not only provides users with access to rich and diverse culinary information but also serves as a helpful tool for individuals seeking to maintain a healthy and balanced diet. In addition, we aimed to include innovative features, such as AI-powered chatbots and voice assistants, to make the app both user-friendly and convenient.

Through extensive research, we identified the need for an application that combines traditional recipes, nutritional information, and local restaurant recommendations in one platform. Our team also conducted market analysis and surveys to ensure that "4epicure" would fulfill the demands of the target audience.

Overall, the development of "4epicure" was driven by the aim of meeting the demands of a growing market for culinary tourism and providing users with a comprehensive and user-friendly experience for exploring traditional cuisine.

Feasibility Study Report:

The feasibility study conducted at the outset of the project indicated that the development of the "4epicure" app was technically, economically, and operationally feasible.

The technical feasibility of the project was confirmed through an analysis of the required technology, including the programming languages, libraries, and frameworks required for the app's development.

The economic feasibility was determined by considering the potential revenue streams, costs of development and maintenance, and the projected return on investment.

Finally, the operational feasibility was analyzed through an assessment of the app's user base, including the target audience and their potential usage patterns.

Requirement Elicitation:

Our team conducted extensive requirement elicitation activities to gather functional and non-functional requirements from people who will be the end users of our application (friends, family members, hostel seniors and juniors, working staff in our campus).

This process included surveys of potential users. From these activities, we identified key requirements, such as the ability to search for recipes by ingredients, filtering recipes by nutritional information, integrating with AI-powered chatbots, and providing restaurant recommendations based on a user's location.

Additionally, non-functional requirements, such as the need for a user-friendly interface, fast response times, accessibility, and efficient data management, were identified as essential to the success of the application.

In summary, our feasibility study confirmed that the development of the "4epicure" app was feasible, and our requirement elicitation process resulted in the identification of essential functional and non-functional requirements necessary to meet the needs of our target audience.

Prototype Design:

Our team designed a prototype for the "4epicure" app, which underwent several iterations before finalizing the design. The initial design was based on a comprehensive analysis of user needs, which identified key features and functionalities required for the application.

The prototype's design focused on creating an intuitive and user-friendly interface, with a clear hierarchy of information and visually appealing graphics. The design incorporated a search bar for recipe search, a recipe details page, a section for nutritional information, and a feature for comparing restaurant ratings and reviews.

One of the significant design decisions made was to integrate AI-powered chatbots, voice assistants, and smart sensors, which provided added convenience and user engagement. These features allowed users to interact with the application in a more natural and intuitive manner, simplifying the process of finding recipes, nutritional information, and nearby restaurants.

The prototype design went through several iterations, with feedback gathered from user testing and usability studies incorporated into each iteration. The final design was based on the best practices of UI/UX design, including color schemes, font choices, and design principles, ensuring that the app was both visually appealing and easy to use.

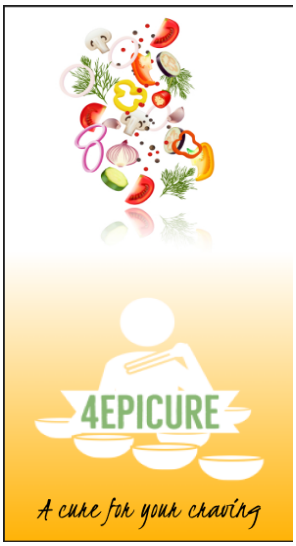
Overall, the prototype design aimed to provide an intuitive and seamless experience for users, with a focus on functionality, usability, and engagement. The iterative design process ensured that the final product met the needs of our target audience and exceeded their expectations.

CLICK HERE TO SEE THE PROTOTYPE

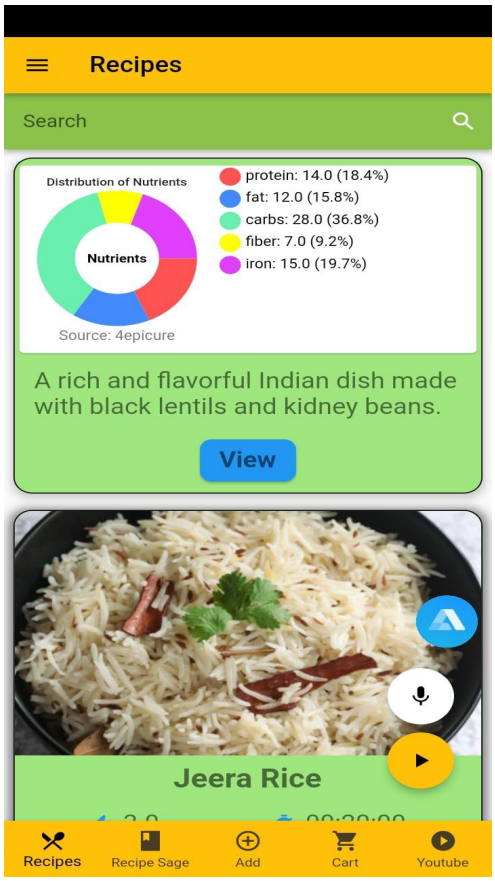
Implementation:

We would like to provide some screenshots of the final implemented app for this section of the report. (Some features are not yet incorporated in the app yet, and are a part of our future task)

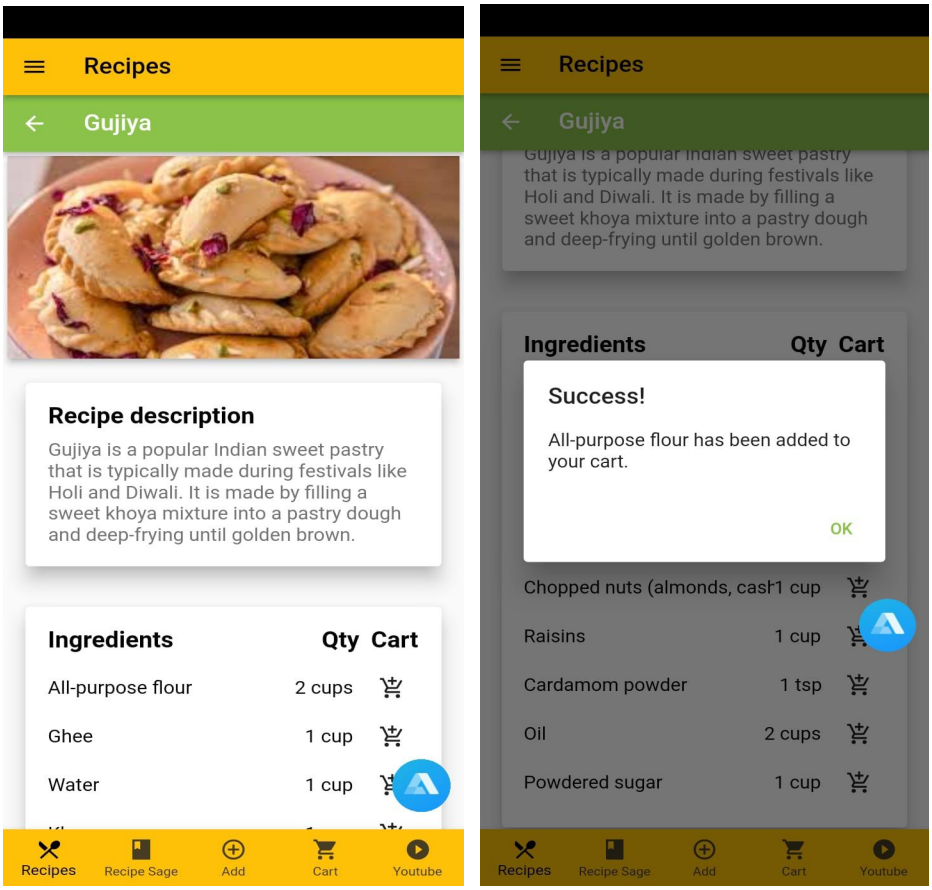
a) Splash Screen:

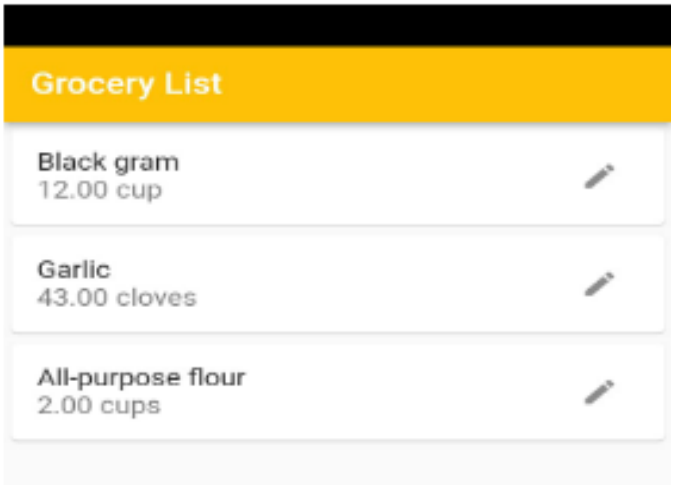


b) Home page: Recipes and nutritional information in graphical representation. Also search recipes without fear of case sensitivity, spaces, etc..

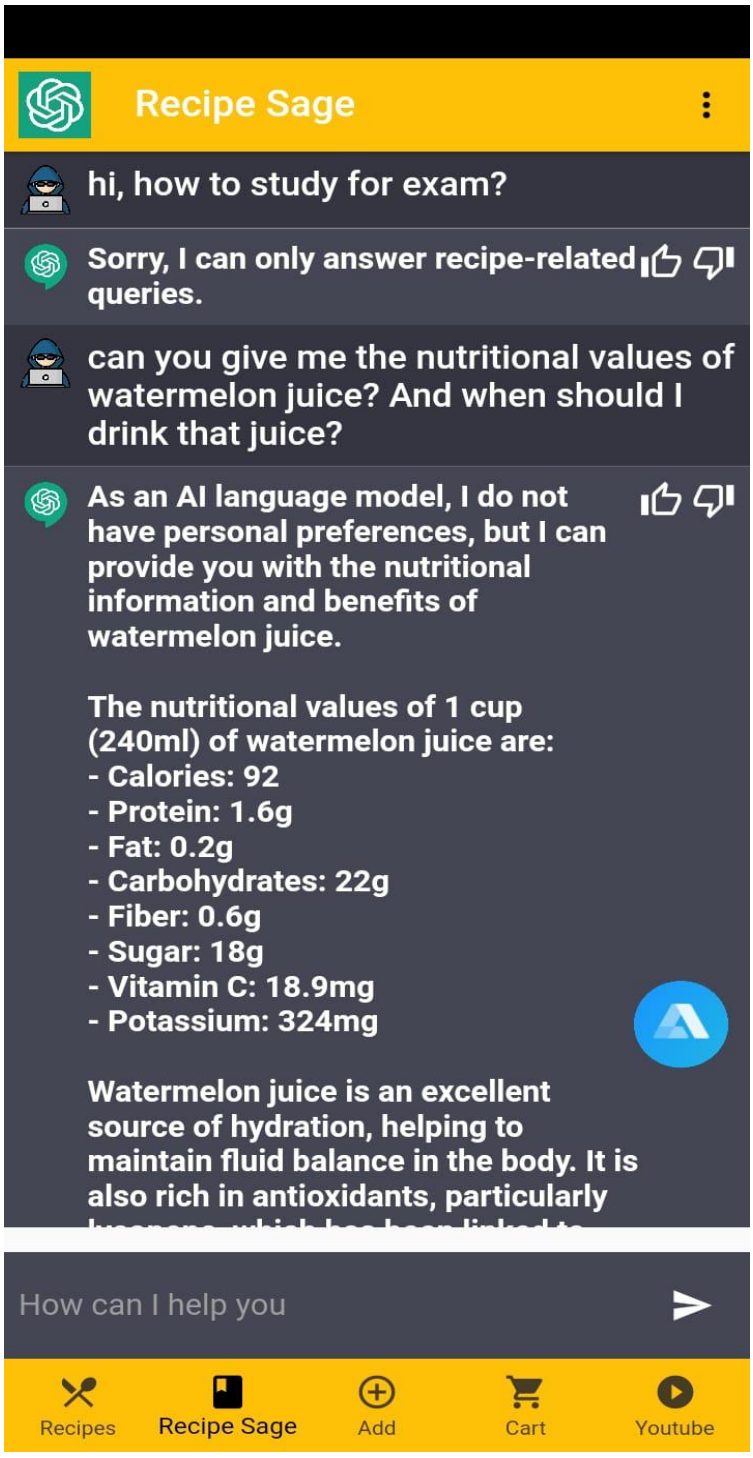


c) Detailed recipe page: Here we can add the grocery items directly to our cart. Edit, delete groceries in cart.

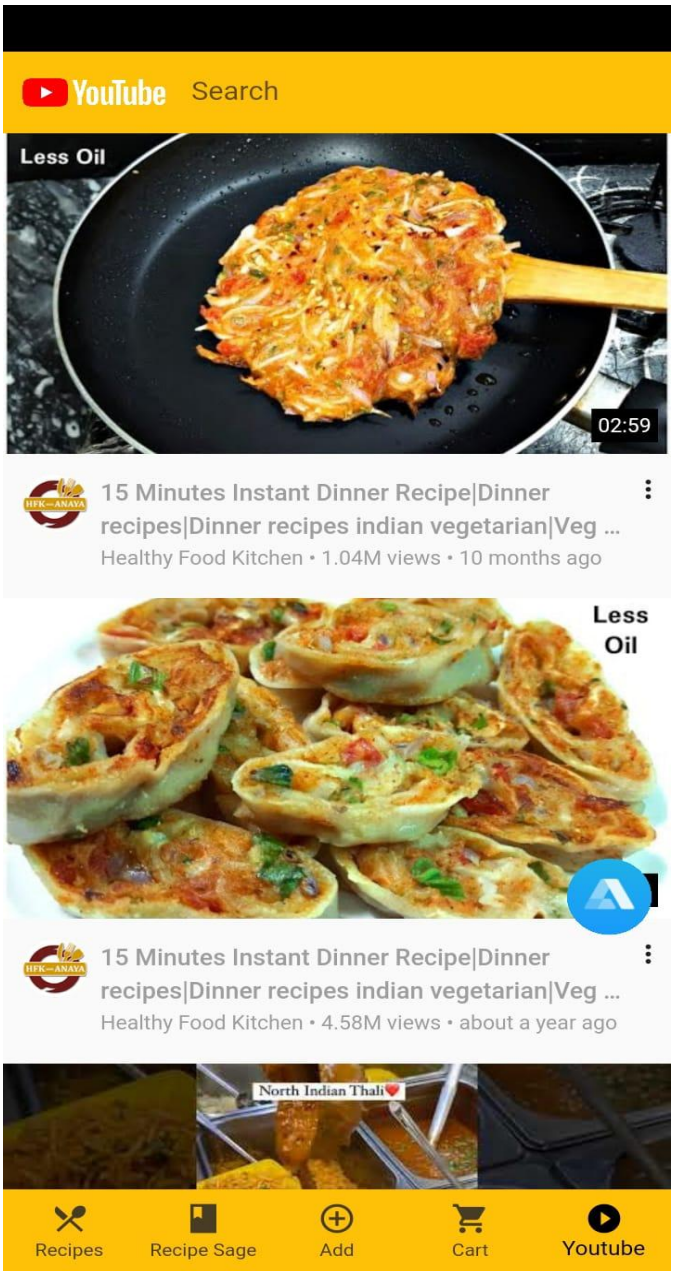




d) Ask questions related to recipes and meals only to chatGPT in our app itself (named as Recipe Sage).



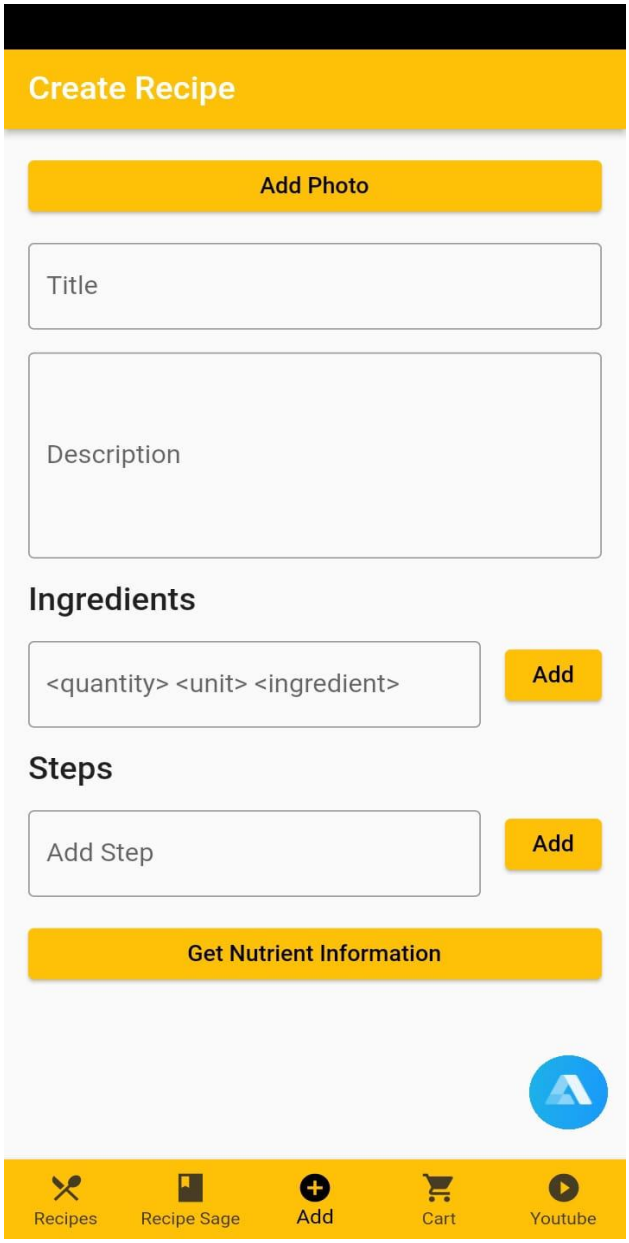
e) Search Recipe or meal or juices in youtube and play the video inside the app itself.

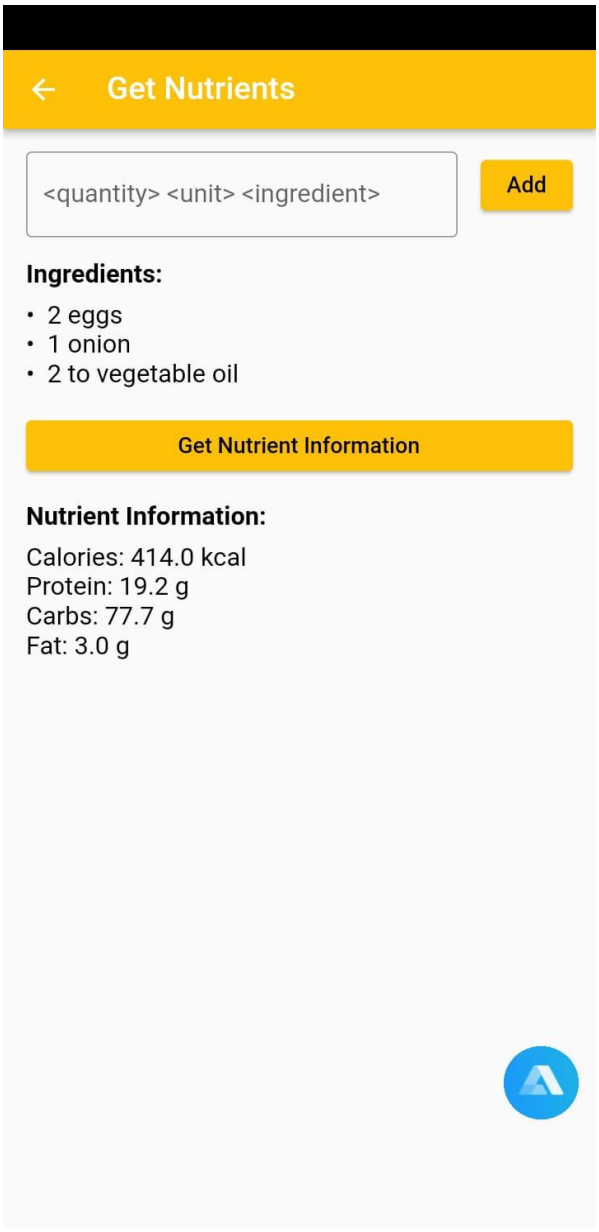


f) Voice assistant (ALAN AI) to ask any questions and also navigate to different pages: helpful for partially disabled people.

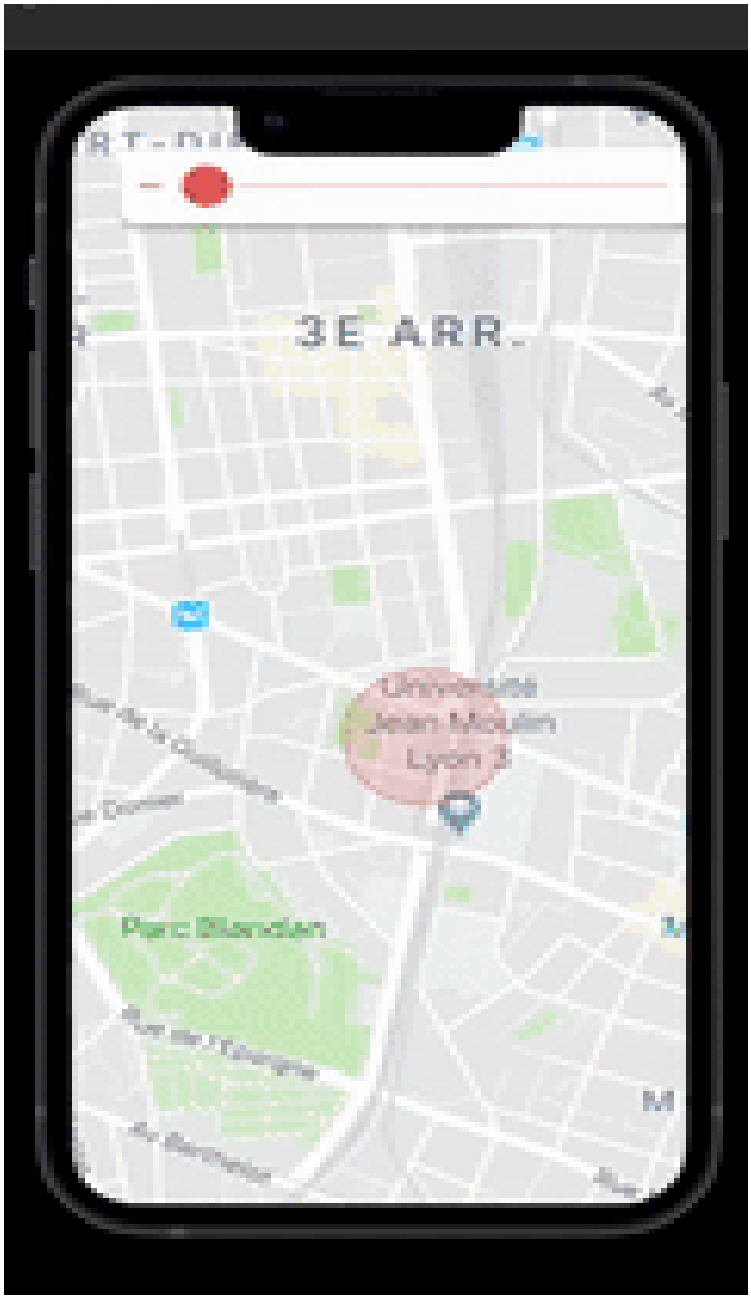
g) Also navigate through the app by shaking the mobile (using accelerometer) and also scroll through recipes without touching the mobile screen.

h) Get nutritional values given ingredients and als post recipes on the web, through the app.





i) Google maps (future implementation idea):



Results: Features (innovative ideas)

1. Integrated map to display restaurants and their reviews within a given radius.
2. Youtube integration to search recipe video tutorials
3. Create and search recipes
4. Nutritional graphical chart for each recipe
5. Voice assistant and,
6. Accelerometer used for navigation (completely touchless UI): accessibility
7. ChatGPT integration

Keeping in mind the future and potential changes in the evolving and revolutionizing field of Artificial Intelligence and various related fields, such as our live example ChatGPT, we strived to incorporate innovative ideas into this project.

Conclusion with our individual experiences:

a) Karthik Avinash (21BCS052): -

i) This project has been a valuable learning experience for me as a first-time full-stack app developer with going in phase with the SDLC (Software Development Life Cycle)

ii) Throughout the project, I have played roles as a frontend, backend, DevOps developer, and Project manager working with evolving technologies such as Artificial Intelligence and integrating them into our application.

iii) Brainstormed innovative ideas, such as AI voice assistants, variable radius in Google Maps to search for nearby hotels, chatbots, touchless accessibility, and graphical representations of nutritional information using pie charts for each recipe, among others.

iv) While working on the project, I trained a model to detect left and right hand movements using camera input to scroll the screen during recipe preparation. Although I could not integrate this feature into our app due to time constraints and version changes in the app SDK, the experience taught me to use simple online tools by Google and Kaggle datasets to train complex models easily to teach machines.

v) One of the exciting aspects of this project was limiting the app's context to recipe-based content. I developed a FastAPI, which runs

inside a Docker container, and accessed it via an IP address throughout the campus network.

vi) Furthermore, I identified three ways to limit the context of chatbots, voice assistants, and YouTube, including an NLP-based rapid-API to classify text into relevant labels, and limiting processing to queries that fall within a predefined list of labels.

vii) To ensure the reliability of our application, I wrote various test scripts for the rest and FastAPIs and hosted the recipe, grocery with nutrition API on PythonAnywhere. Finally, I created 13 releases of the app using the CI/CD (Continuous Integration and Continuous Deployment) methodology using GitHub Actions workflows.

viii) Throughout the project, I also explored AWS Amplify and also hosted rapid API on EC2 instances using Gunicorn.

Overall, this experience has prepared me to take on any future project with confidence.

TEAM 4epicure:

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