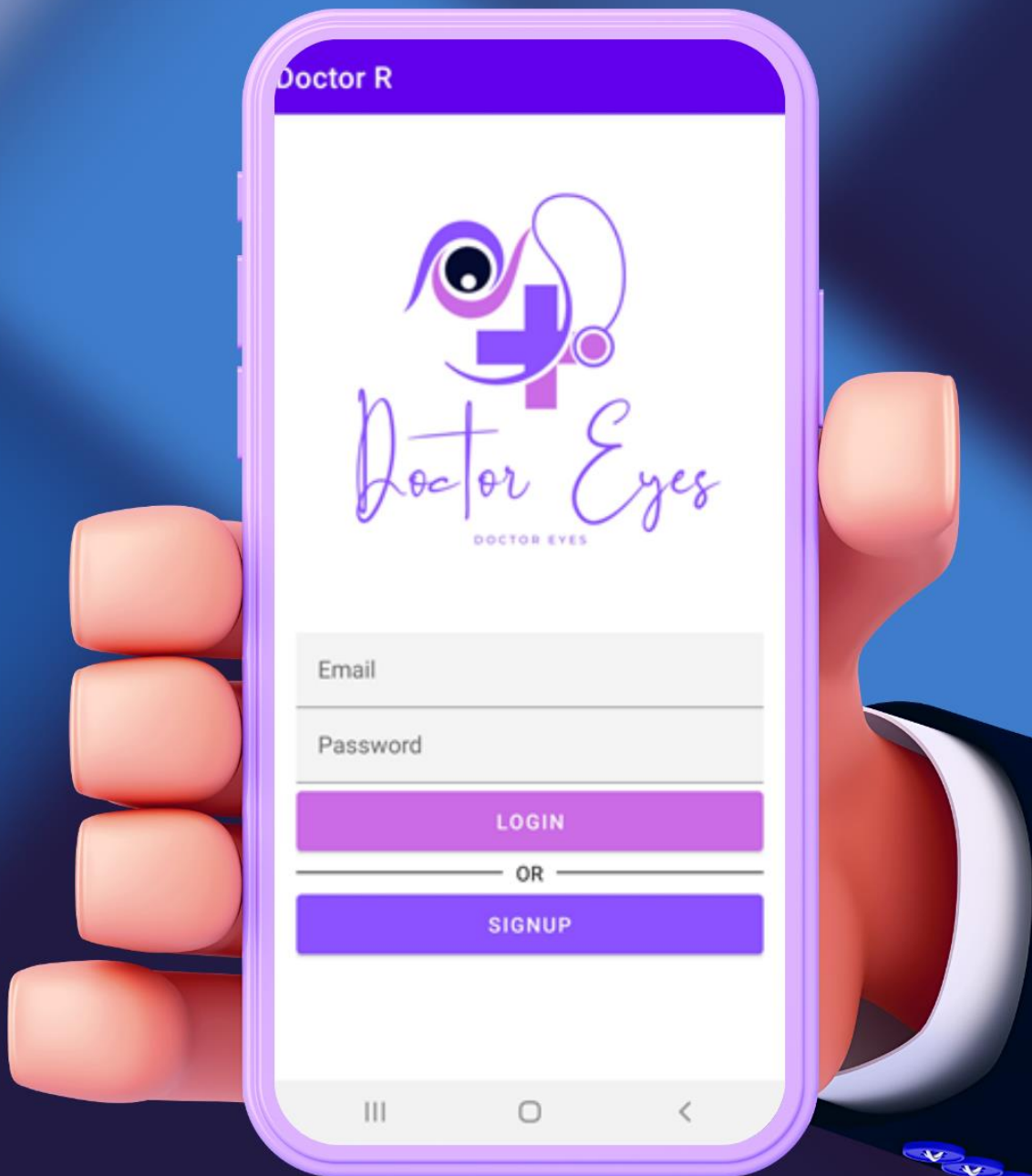


DOCTOR EYES

Mobile app Food Recommendation system for disease using machine learning algorithms



DOCTOR R

Ruqaiya Khalid AIOfi

A PROJECT REPORT ON

(Mobile app Food Recommendation system for disease using machine learning algorithms)

By

(15s13438, RUQAIYA KHALID NASEER ALOFI)

Guided by

(Jayakumari Chitathukattle)

A Project report submitted in partial fulfillment of the requirements for the award of

(Bachelor of Science in Computer Science with pathway in Computer Science)



MIDDLE EAST COLLEGE

Knowledge Oasis Muscat, Muscat, Oman

June, 2022

A PROJECT REPORT ON

(Mobile app Food Recommendation system for disease using machine learning algorithms)

(Doctor's Eyes)

By

(15s13438, Ruqaiya Khalid Nasser Al Ofi)

June, 2022

DECLARATION

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APPROVAL FORM

This project report entitled "**Mobile app Food Recommendation system for disease using machine learning algorithms**" has been submitted by (15s13438) Ruqaiya Khalid Nasser Al Ofi **is approved** in partial fulfilment of requirements for the award of **Bachelor of Science in Computer Science with pathway in Computer Science.**

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Chapter 1

ABSTRACT

Technology has advanced greatly in the last few decades and now phones handle the majority of the work that humans are accustomed to performing, so we must keep pace with it in many ways and use that to improve our scientific, practical and healthy lives. I'm not suggesting replacing humans with machines, but instead making the machine perform more precise tasks to reduce the workload by reducing time and effort, as well as a portion of the mistakes we make. As a result, the technology is increasingly being applied in the field of medicine. These techniques have contributed to raising awareness of nutritional health and the process of obtaining appropriate treatment plans for patients based on their medical condition and medical history. Many countries have implemented artificial intelligence to manage the health and food system. Here in this project we want to increase health awareness and interest in food to reduce and treat food related diseases. Moreover, the aim is to help the patient choose the appropriate food for his condition.

Introduction:

Many elements have been identified as having an impact on an individual's health. Other external effects include physical activity, sleep, and diet. Given that eating is one of the most adjustable aspects of our lives, it's no wonder that little changes may have a large impact. We can connect technology and food using modern science and machine intelligence. In this project, a phone application that scans and analyzes photos to extract nutritional information from food labels will be devised and implemented. Then it will be compared to the user's health to evaluate whether or not this meal is acceptable for them. Attaching a suggestion to look for a food with the nutrition it requires.

Problem Statement:

There are several problems that I have encountered or may encounter in completing this project:

There is no prior knowledge of Machine learning or how to analyze an image, extract data from it, and deliver it to Clint.

Suggesting solutions:

Every problem has a solution. So these are the suggested solutions to avoid or solve the problems I encountered:

Learn artificial intelligence through courses and YouTube clips. Try to Learn to analyze images using Python. and for the dataset I need to Collect data to create a new dataset.

Project Scope:

This system was created specifically for those who have diseases that limit them to adhere to a certain dietary pattern. Also for those who want to gain or lose weight.

duration:

The project is expected to complete within a time span of 6 months. After that, the work of the program will be checked and its development will be considered.

Cost:

The overall cost for designing and developing the System including all overhead expenses is estimated to be approximately OMR 4500.

Table 1 Project Cost

Dataset	2000 OMR
coding	600 OMR
Program used	100 OMR
Work cost 1 hour = 3 OMR Work daily = 4 hour in day 3*4=12 hour Monthly work day = 25 day 12*25=300 OMR monthly 6 month of work 300*6=1800	1800 OMR

Software used:

Table 2 Software used in the application

front end	XML
back end	ML KIT JAVA
DATABASE	FIREBASE REAL DATABASE
CLOUD	GOOGLE CLOUD
UI/UX & TOOLS	ANDROID STUDIO

Describing the features of the application:

Through this system, the user can attach or take a picture of the meal components. To be analyzed and data extracted from it, and to give an alert as to whether this meal is appropriate or not. Then he attaches suggestions for similar meals that suit the user's condition.

Stakeholders:

Internal Stakeholder: They are people who have a direct link with a company and are interested in it.

external Stakeholder: They are people who do not work directly for a corporation but are influenced by its activities and outcomes in some manner.

list of stakeholders:

Internal Stakeholder: Employees, Owners, Board of Directors, Managers, Investors etc.

external Stakeholder: Patients, competitors, society, government etc.

user interface, hardware & software interfaces:

The user interface is compatible with all systems.

The system can be used by downloading the program and installing it on the phone.

Aims & Objectives:

The main and most important goal of designing and developing this system is to serve as a helping arm for those who wish to take care of their diet or treat a food-related disease.

The Objectives of establishing this system is to:

1. Keeping pace with the technological revolution.
2. Turn the machine into a medical aid.
3. Checking whither the food is suitable for the user

Contribution:

This application will give the user information on which foods are good for their health. He'll also attach meal ideas that contain the nutrients he needs and look for items with healthy elements. Where it takes the place of a nutritionist.

Chapter 2

Introduction:

The user's health data is stored in the application database, which is how this software works. He may then take a picture of the food labels for any meal he wishes to purchase. The computer next analyzes the photos to extract nutritional data and compares it to the user data stored in the application database. The application then informs the user whether or not this meal is safe to consume, along with many possibilities for what nutritional values he should look for in the meal, as well as meals that may be suitable for his health condition.

Our research aims to avoid these issues by developing an image analysis API that reads and reports directly on nutrition label information. To extract useful information from a feed label picture, our solution contains a C++ library that integrates image preprocessing, optical character recognition, and post processing methods. To increase the accuracy of traditional data input methods, we use our knowledge of nutrition label content and data arrangement. For most poster pictures, our technology presently gives up to 80% accuracy, and we will continue to work to enhance our accuracy.

(Google Developers, n.d.)

Describing similar applications

Sowah, R.A., Bampoe-Addo, A.A., Armoo, S.K., Saalia, F.K., Gatsi, F. and Sarkodie-Mensah, B., 2020. Design and development of diabetes management system using machine learning. *International journal of telemedicine and applications*, 2020.

This article details the design and deployment of a software system that uses a machine learning technique to enhance diabetes management, as well as demonstrating and evaluating its usefulness in diabetes control. By merging numerous artificial intelligence algorithms, the suggested strategy of this management system addresses the many elements impacting the health of diabetes patients. The challenge of diabetes management is also divided into sub-goals using this framework: As a consequence, users may upload a picture to check if a meal is suggested for eating; the K-Nearest Neighbor (KNN) meal recommendation algorithm is used.



FIGURE 2: The activity flow diagram for the implemented system architecture.

Figure 1

Rita, L. (2020). *Building a Food Recommendation System*. [online] Medium. Available at: <https://towardsdatascience.com/building-a-food-recommendation-system-90788f78691a>.

The purpose of this project was to create a system for recommending items and meals for diets. This involves retrieving components from the Recipe1M+ dataset after it has been preprocessed, as well as to enhance the terminology of the items in order to match those in the recipe text. In addition, this computer recognizes meals and calculates the average quantity of cancer particles in each dish. Aside from a score for the estimated number of antineoplastic medication adverse interactions.

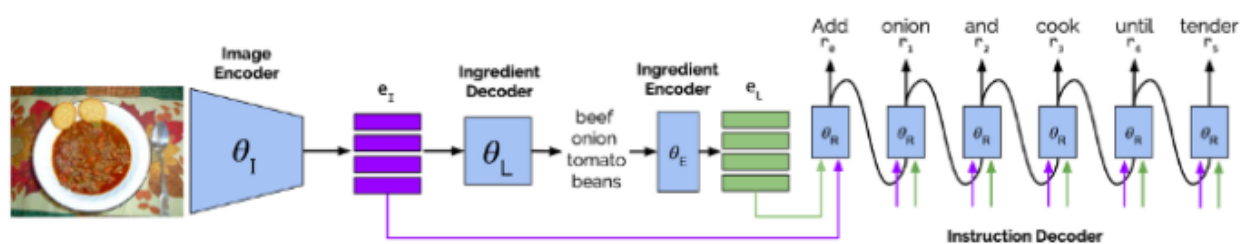


Figure 2 Inverse Cooking recipe generation model with the multiple encoders and decoders, generating the cooking instructions [11].

Figure 2

Githubusercontent.com. (2016). [online] Available at: https://raw.githubusercontent.com/CSIT-GUIDE/FYP-2016/master/1803_Kundan_FoodRecommendationSystemBasedOnContentFilteringAlgorithm.pdf [Accessed 10 Dec. 2021].

This study looked at a list of nutrients and how they affect the outcome based on the nutritional content of the food item. An important nutritional component is recognized here. If any item is indicated as the major ingredient in the database, the nutrients are given in order of their nutritional value. This application examines the nutrients in the database, as well as their primary components. When the user's requested ingredient is discovered in the current food database, it is sorted and filtered according to its nutritional value. The quantity of calories in the food is taken into consideration in this calculation. The user is given a recommendation based on the number of calories in the food item. The content filtering algorithm is used to make the suggestion.

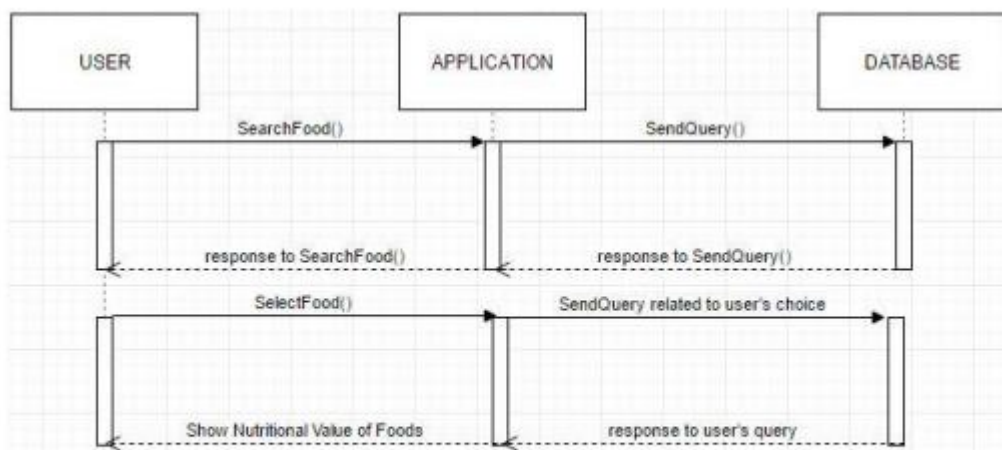


Figure 2 - Sequence Diagram of the application

Figure 3

Γιαννιός, Λ.Λ. and Giannios, L.L. (2021). Machine learning techniques integrated in an information system towards the analysis of social media food data. *dione.lib.unipi.gr*. [online] Available at: <https://dione.lib.unipi.gr/xmlui/handle/unipi/13729?show=full> [Accessed 10 Dec. 2021].

The goal of this article is to show a full mobile application with a user interface written in Dart and Flutter. The app uses Firebase for authentication, Fire Store for data storage, and Firebase Storage for backup, as well as Firebase Cloud capability to store photographs and videos. The project's goal is for the program to detect food photographs and their contents using machine learning. It can also find related recipes and make recommendations for additional foods and meals.

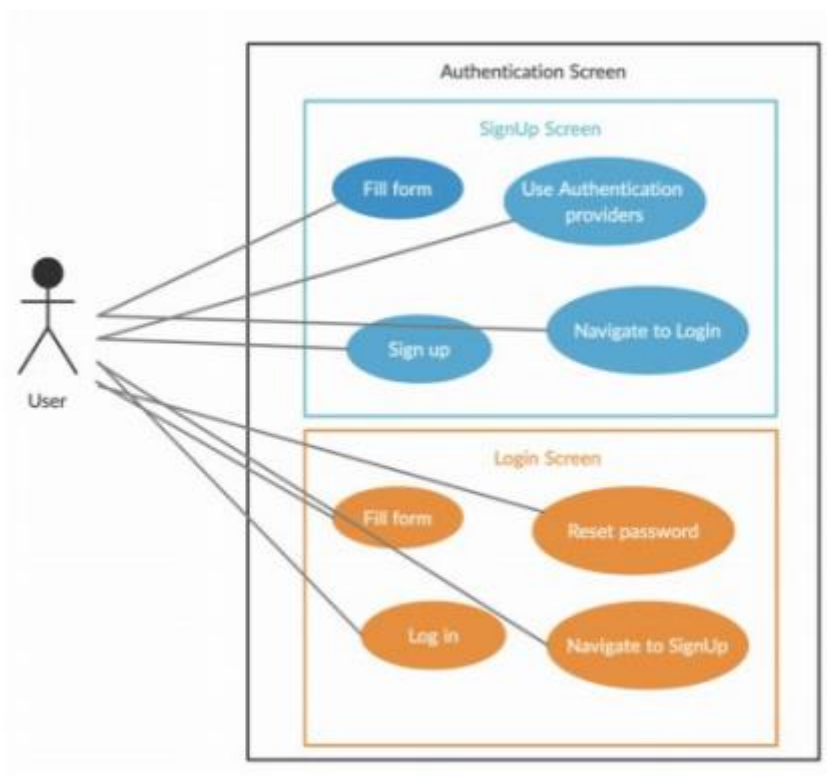


Figure 4

Reviewing literature

Matsunaga, N. and Sullivan, R., 2015. Image processing for the extraction of nutritional information from food labels.

This project aims to solve difficulties that people frequently encounter by developing a software interface that analyzes photos and generates a report. The following information is taken from the nutrition label. A C++ library was used to create this project, which combines image preprocessing, optical character recognition, and post processing techniques to extract useful data from a picture. They also utilized the Python programming language to automate the program's tests since it is more versatile and user-friendly than others.

This report will assist me in understanding the actions that I must take from the start of the project to its end, since it provides several resources and tools that will make the program's job easier.

Nasir, M.A.M. and Othman, N.Z.S., 2018. Food labelling recognition using OCR for mobile application. IUTM Computing Proceedings: Innovations in Computing Technology and Applications, 3, pp.1263-1267.

This article discusses a smartphone application that allows you to take images of food packages, analyze the image, and calculate the nutritional content that must be ingested daily when eating the meal. Consumers may be able to better plan their diets simply by utilizing their cellphones as a result of the creation of this software. The Tesseract Optical Character Recognition (OCR) engine was used to create this app, which was created in Android Studio.

This information aided me in deciding which application development program to utilize. It also showed me how to utilize the OCR engine, which I will be using in my project.

Marinha, L.R.A., 2015. Automatic Nutritional Information Extraction from Photographic Images of Labels.

This paper analyzed data from a project that uses an Android app to provide consumers with a tool to help them extract and evaluate nutritional numbers from product labels. This program tries to automatically extract nutritional information from a nutrition statement image and show it in the form of a single cross-section, in accordance with the new requirements and with some added help, such as relative values of recommended daily dosages and simplified charts. In addition to this functionality, you may compare two items from the same category. It is important to transform the image into digital text for further processing in order to achieve these objectives. The program leverages Tesseract, a Google-developed OCR engine, to do this conversion.

In my project, I may utilize the same approach as in this one. It's simple to use, smooth, and uncomplicated.

Firly, N., 2018. Create Your Own Android Application. Elex Media Komputindo.

This book was about how to build an Android application from the ground up for a professional audience. and to make it available on the internet.

This book has a wealth of relevant information that will aid me in my endeavor. I'll learn how to make a phone application from him because this is my first time in this subject, but I found it simple thanks to this book. Everything was explained in great depth in a seamless and easy-to-understand manner.

altametrics.com. (n.d.). استخدام التحليل الغذائي لبناء قائمتك. [online] Available at: <https://altametrics.com/ar/inventory-management/nutritional-analysis.html> [Accessed 15 Dec. 2021].

This study discusses the nutritional analysis methods that patients and people interested in a healthy diet should use.

This will assist me in determining the road I should take in terms of assessing foods and diseases and determining the best approach or strategy for performing a proper nutritional analysis.

Feasibility Analysis

Feasibility study is to determine a concept's feasibility, such as determining if the idea is legally, technically, and financially feasible. It tells us if the project is worthwhile. In some cases, the project may not be feasible. There are several reasons for this, including the necessity for excessive resources, which not only prevents these resources from performing other tasks, but also may cost more than the organization would make from taking on an unproductive project.

The chance of a project's success is determined by a feasibility analysis. As a result, the study's apparent impartiality is a key component of its reputation among potential investors and lenders. There are five different types of feasibility studies:

1. Technical.
2. Economic.
3. Operational.
4. Functional.
5. Social.
6. Legal.
7. Scheduling.

(Simplilearn, 2012).

Technical Feasibility:

This evaluation focuses on the technological resources available to the company. It helps businesses determine whether technical resources are sufficient and whether the technical team is capable of transforming ideas into business processes. The hardware, software, and other technical requirements of the proposed system are also assessed for technical viability. (Simplilearn, 2012).

The application uses HTML to show content, CSS to make it seem more user-friendly, and JavaScript to make the app interactive. The logic is implemented on the server side using Python, Kotlin, and Filter for dynamic application creation, displaying the anticipated outcome in the app, and handling page requests. To work effectively, you'll need a server, a client, and an internet connection.

Economic Feasibility:

This evaluation comprises performing research to determine whether the needs of the organization can be met by completing the project. Operational feasibility studies also look at how the project plan matches with the requirements identified during the requirements analysis stage of system development. (Simplilearn, 2012).

This project's Economic feasibility study will be as follows:

This project does not require any funding. All of the necessary criteria and tools may be found on the Internet and can be downloaded for free. The project may be sponsored in the future in order to obtain instruments to aid in its development. The information on health and food came from a variety of places, including websites, hospital visits, and interacting with a food professional to get an accurate nutritional diagnosis for each ailment. Also there is no charge for uploading the application to the internet.

Operational Feasibility:

This evaluation entails conducting research to establish whether the organization's needs can be addressed by finishing the project. Operational feasibility studies additionally look at how the project plan aligns with the requirements determined during the system development's requirements analysis stage. (Simplilearn, 2012).

The application's customers are the end users. They are the ones who go on the lookout for nutritional value in food. All meal items and their nutritional value are recorded by the server.

Functional Feasibility:

refers to a single system or a component of a bigger organization Regardless of how the other units do, each unit has a specific task to fulfill. The success of each individual unit determines the process' final outcome. While the functional success or failure of all units may or may not have a significant negative influence on the process's success, it is the process's completion that is critical.

(www.aviationpros.com, n.d.)

Social Feasibility:

Social viability is the study of how people interact with one another inside a system or organization. A social impact study's purpose is to discover and assess these aspects in order to establish the scope and magnitude of a project's societal consequences. (Essays, Research Papers and Articles on Business Management, 2018)

Legal Feasibility:

This assessment examines if any aspect of the proposed project violates legal standards such as data protection or social media laws. (Simplilearn, 2012).

Scheduling Feasibility:

The success of the project hinges on the outcome of this assessment. After all, if the project is not done on time, it will fail. The company calculates how long the project will take to complete using feasibility scheduling. (Simplilearn, 2012).

The application's development is expected to take 7–15 weeks in total.

Minimum System Requirements for Android Studio:

Table 3 Minimum System Requirements for Android Studio

Microsoft Windows 7/8/10 (32 or 64 bit).
Mac OS X 10.8.5.
GNOME or KDE or Unity desktop on Ubuntu or Fedora or GNU/Linux Debian.
2GB RAM.
4GB RAM recommended.
500 MB disk space
1 GB for Android SDK.
Java Development Kit (JDK) 7.
1280x800 screen resolution.
A faster processor (according to your budget).
Setting up Android App Development Environment

Cost:

The overall cost for designing and developing the System including all overhead expenses is estimated to be approximately OMR 4500.

Table 4 Cost

Dataset	2000 OMR
coding	600 OMR
Program used	100 OMR
Work cost 1 hour = 3 OMR Work daily = 4 hour in day 3*4=12 hour Monthly work day = 25 day 12*25=300 OMR monthly 6 month of work 300*6=1800	1800 OMR

the key features and functionality of application:

1. Conciseness:

The program shall be simple in design so that the user can use it easily and without difficulty moving between pages. To improve the customer experience and encourage them to continue using it, the interface will be straightforward and uncluttered, with clear signs for the next step in the application process. There will be no ambiguity.

2. Speed:

The loading of displays in this program will be quick.

3. Image resolution of high quality:

The screen must be sufficiently detailed to make the user experience valuable, therefore app performance must be balanced with usefulness and resolution.

4. Adaptability:

In the future, the application's use will be more flexible.

It will be accessible in all major phone operating systems at a later date.

5. Safety and security:

Security on the internet is becoming increasingly important, and our app is no different. With so many applications containing personal and sensitive data, we must ensure that our apps are secure.

(Guest, 2018)

Chapter 3

Introduction:

It is a program that allows you to photograph food labels in order to verify the ingredients before purchasing them. This software examines food label photos to check if they match the user's health information (who previously entered it in the program). The program will provide an alert authorizing the purchase if the food product is suitable with the user's health. Otherwise, you will receive an alert stating that this product is not acceptable and that you must choose another product with the proper nutritional content.

Aims & Objectives:

The main and most important goal of designing and developing this system is to serve as a helping arm for those who wish to take care of their diet or treat a food-related disease. As a result, he will be able to select the appropriate meal for his health status. There is no need for the food specialist to interfere in giving advice and determining the type and quantity of meals, as the program will do all this.

The Object of establishing this system is to:

- Keeping pace with the technological revolution.
- Turn the machine into a medical aid.
- Determine the appropriate meal for the health of the user.
- Learn the nutritional value of the meal.
- Suggestions for meals suitable for the health of the user.

SWOT Analysis for Methodology.

Table 5 SWOT Analysis for Methodology

Strengths:	<ol style="list-style-type: none">1. It shortens the time spent on choosing the right foods.2. This is a free and simple application.3. It chooses food that is suitable for the health of the user.4. It helps in facilitating the treatment of food-related diseases.
Weakness:	<ol style="list-style-type: none">1. The program may not provide all diseases related to food.2. It is possible that the patient's health data was entered incorrectly, and this affects the validity of the results given.
Opportunities:	<ol style="list-style-type: none">1. It is considered the first application of its kind in this field.2. Anyone can use it regardless of their background in technology.3. simple and easy user interface.
Threats:	<ol style="list-style-type: none">1. Lack of data may lead to fewer users.2. It is likely that a competitor will come to the application.

Table 6 methodologies

methodologies	meaning	Advantages	Disadvantages
Agile	<p>Customers are shown how to utilize the final product and what problems need to be fixed using the Agile process. This informs the project team about the customer's expectations. Agile is a project management method that breaks projects into stages and incorporates ongoing communication with stakeholders as well as continual improvement at each step. As the teams plan, execute, and assess the process to verify that the final product fulfills the customer's needs, the sequencing of the teams may be revised after the work begins. As a consequence, the Agile method offers a lot of promise for companies looking for fresh ideas since it pushes employees to make significant changes by restricting the amount of tasks they can accomplish.</p>	<ul style="list-style-type: none"> • Small difficulties may be identified and addressed by teams before they become major concerns on projects. • Teams can incorporate business stakeholders and their comments in the improvement process. • It's a key step in more complicated development initiatives. • The crew will be able to keep track of the project's development at all times. 	<ul style="list-style-type: none"> • Due to a lack of procedure, people might quickly become disoriented. • The incremental delivery model of Agile creates a dilemma for long-term projects. • Maintaining a high degree of communication between team members and business stakeholders is tough.
Lean	<p>A business methodology is another name for the Lean approach. It is founded on two principles: constant development and treating people with respect. Furthermore, enhancing access to information is at the heart of lean methodology, ensuring an efficient choice to generate customer value by offering a service or a product.</p>	<ul style="list-style-type: none"> • The ideas of lean approach are centered on reducing waste. It is lowering programming and budgetary efforts. • obtaining information from the originating source, which aids in the reduction of issues arising from unrelated program outputs and client needs. • The ability to empower a team by allowing them to choose to accept unforeseen difficulties is provided by the short iteration advantage. <p>Project completion as fast as feasible benefits organizations.</p>	<ul style="list-style-type: none"> • A single failure on one side might put the entire application to a halt. Everything is used in the operation in a lean approach, so the team cannot overcome a failure. • Due to equipment failure, there has been a lack of consistency in delivery. This is done in order to break up client connections and send them to rivals. As a result, the price of failure is prohibitively high.

Waterfall	<p>The waterfall technique, also known as the waterfall model, is a sequential development process that cascades through all stages of a project (for example, analysis, design, programming, and testing), with each step finished before moving on to the next.</p>	<ul style="list-style-type: none"> • After the criteria have been determined, the overall cost of the project, as well as the schedule, may be reliably predicted. • It's simpler to track progress with an organized approach since milestones are clearly defined. • New developers will have no issue coming up to speed on a current project because the requirements document should contain all they need to know. • Customers don't always add new needs to the project, which causes production to be delayed. 	<ul style="list-style-type: none"> • Projects may take longer to finish using this historical method than with an iterative plan, such as the Agile process. • Clients typically do not know exactly what they want up front, resulting in requests for changes and new features later in the process, when they are more difficult to accomplish. • The design and execution stages are not open to clients. • When one step of a process is delayed, all following phases are also postponed. This is known as deadline creep.
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Justifying methodology:

The methodology of a project is Agile. It is described as a guideline that assists users in achieving project goals by utilizing tactics and procedures to help them reach their objectives. Choosing a technique to follow makes it easier to solve problems and prepare and analyze data. Methodology's objective is to arrange structure and work processes.

In order to avoid and learn from mistakes, and to assure continual progress, focus on recurring aspects. The approach also enhances project efficiency by employing certain tools and procedures. Other advantages of methodology adoption include minimizing project internal and external risks, strengthening human skills, and structuring project time.

Stakeholder collaboration: Before, during, and after a project, the Agile methodology provides a vital opportunity for stakeholder participation. Clients are included in every phase of the project development process, which helps to improve client-project team collaboration. Furthermore, it is a valuable asset that aids in the understanding of client comments and expectations.

Changing Benefits and Adding New Features: The Agile methodology allows the development team to add and alter functionality. It's a flexible technique that allows for adjustments at any time during the system development life cycle, whether early or late.

Quality Improvement: Agile is based on breaking jobs down into smaller parts, which allows teams to focus on producing high-quality output, reviewable testing, and effective communication. Quality is frequently increased through swiftly finding and resolving flaws, as well as identifying potential defects.

Schedule and Cost Predictability: In Agile, each stage has a set length and cost. Clients understand and will comprehend the cost of each addition, making it easier to decide which features are most important to add.

(SRS):

System Requirements Specifications (SRS): A system requirement specification (SRS) is a document that outlines an application's features. It has several parts that outline the features that clients need to offer to a huge number of consumers.

Gathering requirements is the first step in the SDLC. It is described as the gathering of pertinent data in order to produce a product or application that meets or exceeds the expectations of the client. At this point, the project manager also tries to meet with a wide number of clients in order to learn about their needs, expectations, and intended outcomes.

Designing:

In the designing phase, the requirements and information obtained throughout the requirement collecting stages become inputs. It's also an architecture for creating and deploying a desired application.

Coding:

The program design is turned into source code at this step. This stage includes the implementation of all functionality.

Testing:

After the code is finished, the testing step begins. The program is put through its paces and flaws are found. Software engineers are in charge of fixing these flaws. Resting the system is an ongoing procedure that continues until the application meets the client's expectations and requirements.

Implementation:

The deployment step begins once the program has been thoroughly tested and found to be error-free. The application is reviewed based on client feedback to verify that the generated application satisfies the customer's expectations.

Maintenance:

After the application has been implemented, the maintenance phase may begin. Three actions occur during the maintenance stage: bug patching, system updating, and enhancement. Because some scenarios were not covered during the testing stage, various issues arose. Upgrading the program to a newer version is also necessary to accommodate different consumers' platform preferences. Enhancement is also necessary when adding new functionality to an existing program.

Application methodology:

Project Planning:

A project plan, which is a bundle of formal papers, defines the execution and control stages of a project. The plan covers risk management, resource management, and communications, as well as scope, cost, and schedule baselines. To ensure that their plans are precise and dependable, project managers use project planning software.

More than just a Gantt chart with activities and due dates, the project plan, also known as a project management plan, covers the projects who, what, where, why, how, and when. The goal of a project plan is to guide the execution and control of project phases.

As previously stated, a project plan consists of the following documents:

- **Project Charter: This document provides an overview of the project at a high level. It comprises, among other things, information about the project's goals, objectives, restrictions, and stakeholders.**
- **A statement of work defines a project's scope, timeframe, deliverables, milestones, and activities (SOW).**
- **Structure of Work Breakdown: The project scope is divided into project stages, subprojects, deliverables, and work packages, which ultimately contribute to the final delivery.**
- **The project plan document includes scope management, quality management, risk assessment, resource management, stakeholder management, schedule management, and a change management plan.**

Resource Plan:

The application resources plan identifies the critical resources needed for the application from start to finish in order to create a high-quality product. The resources are divided into three categories in the table below.

Table 7 Resource Plan

Type of Resources	Components	cost
Human Resources	Project Manager The project manager's primary role is project management. The project manager is in charge of making strategic decisions. He should also evaluate the application's stages to ensure that it is being created properly.	700 RO
	Customers They are the project's primary source of revenue. They are involved in all phases of the project, evaluating work and providing comments.	free
	Programmers: are in charge of writing the code for the program and making it available on various platforms. They are also in charge of creating new jobs and ensuring that existing ones are completed effectively.	400 RO
	Testers: are responsible for verifying that the program is transparent by executing multiple scenarios to guarantee that it is error-free.	90 RO
	Technician personnel: Any technical concerns must be resolved by technical personnel.	100 RO
	Security and Maintenance Personnel: This group is in charge of developing a security and maintenance plan to keep the application secure and advanced.	200 RO
Hardware	<ul style="list-style-type: none"> • HP laptop • Smart phone 	900 RO
Software	<ul style="list-style-type: none"> • Microsoft Word • Android studio • PostgreSQL • Star UML • Miro 	100 RO

communication plan:

A communication plan is a strategy for sharing information with stakeholders. It's critical to specify what information you'll supply and to whom you'll send it. In addition, in the communication plan, the communication routes must be clarified. It's also crucial to identify what information needs to be supplied to clients. In addition, generated feedback and other needed information must be documented and stored. The communication plan timetable is outlined in the table below.

Table 8 communication plan

Communication with	Type of Communication	Objectives	Benefits	Time
Ruqaiya (Me)	Project discussion	Reviewing the task and clarifying the information needed for each section.	Delivering a high-quality task.	One day in a week
Supervisor	Interview	Considering the benefits and drawbacks of designing an application Also, talk about how the duties have been completed thus far.	Delivering a high-quality task. Also, improve the project task.	One-time
Maymona Albaloshi (nutrition specialist)	Interview	To determine the proper dietary pattern for certain illnesses that can be treated with food.	understanding of food-borne illnesses It aids in the development of high-quality applications for the majority of food-related disorders.	One-time

Acceptance Plan:

The acceptance plan is crucial to the project's success. Assists in getting project deliverables accepted by customers. With an acceptance strategy, the client promptly accepts the result and puts it to good use. Customers should be included in the project development process to speed up delivery acceptance.

Table 9 Acceptance Plan

Deliverable Standards	Agreement Standards	
Planning Stage	Time Duration	The scope and functionalities of the application must be within the budget and time constraints set out.
	Project Budget	
Application Designing	Before commencing the real design, present the first application design to stakeholders. In addition, the app's design should be simple to utilize within the clock's three functions.	
Application Deployment	Ascertain that the application satisfies the needs and expectations of the customer. Functions of the application have been implemented. Additionally, ensure that the app is simple to use for practically all clients.	
Application Testing and Maintenance	Run many scenarios to ensure that the program is free of bugs and problems. In addition, a maintenance plan for future development should be created.	

Work Breakdown Structure (WBS):

Between the start and finish dates of a project, the work breakdown structure shows the particular tasks that were completed. It also shows how long each task will take to finish.

Task	Dura...	start	finish
1	✦ Strategy	30 d	11/01/21 12/01/21
6	☰ Analysis and Planning	30d	12/31/21 01/30/22
7	defining use cases and capturing detailed functional requirements.	5d	12/31/21 01/05/22
8	prepare a product roadmap.	10d	01/05/22 01/15/22
9	identifying the skills needed for the app development initiative	13d	01/15/22 01/28/22
10	select mobile app name	1d	01/29/22 01/30/22
11	✦ UI / UX Design	10d	01/31/22 02/10/22
17	☰ App Development	120d	02/10/22 06/11/22
18	define the technical architecture	2d	02/10/22 02/13/22
19	pick a technology stack	1d	02/13/22 02/15/22
20	define the development milestones	5d	02/15/22 02/20/22
21	Back-End/Server Technology	10d	02/20/22 02/30/22
22	API	20d	03/01/22 03/20/22
23	Mobile App Front-End	5d	03/20/22 03/25/22
24	write database	30d	03/25/22 04/25/22

Figure 5 Work Breakdown Structure

Gantt Chart:

The project schedule is depicted using a Gantt chart. The job lists are displayed on the vertical axis, while the time duration is displayed on the horizontal axis. It also shows the needed start and end dates for each assignment.

Figure 6 Gantt Chart

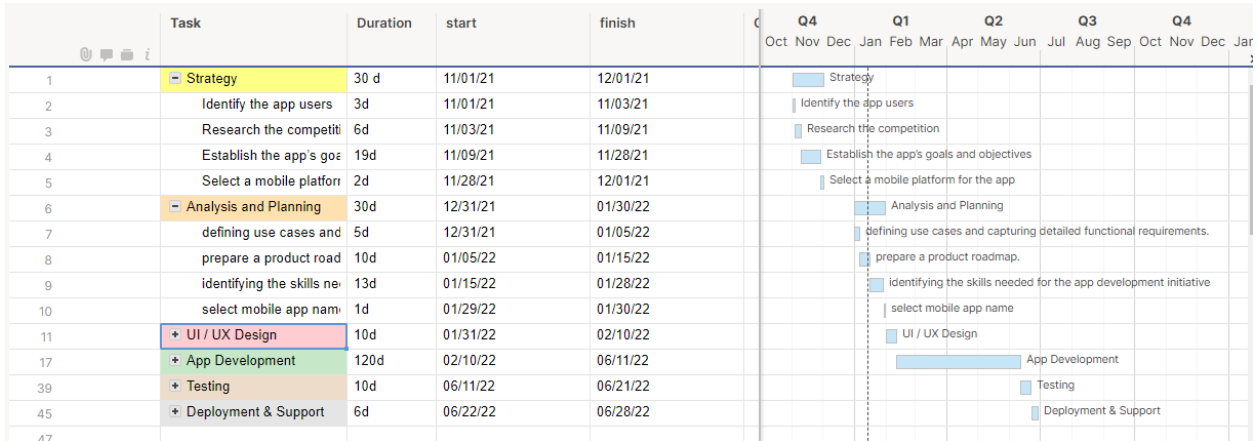
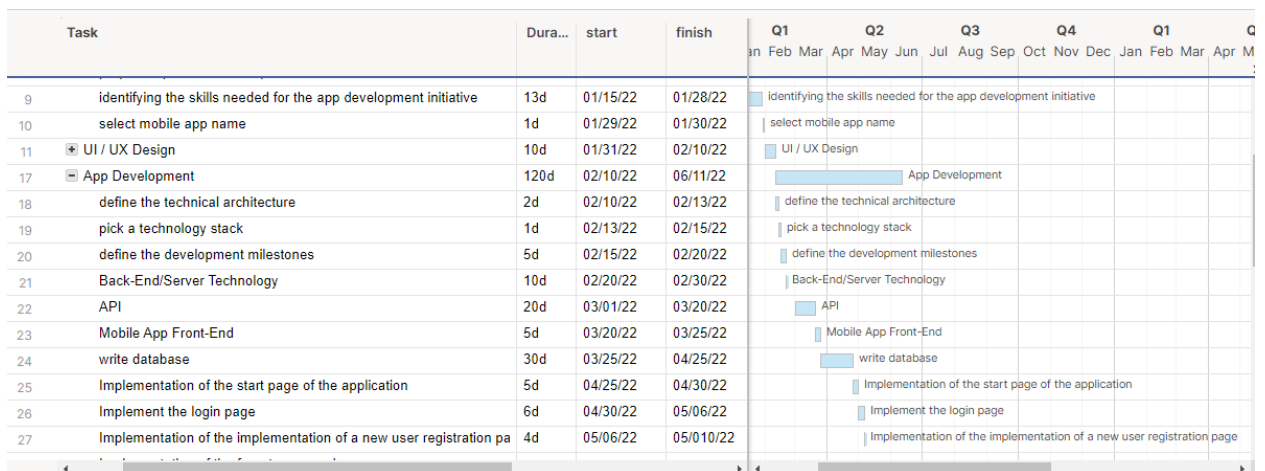


Figure 7 Gantt Chart



Risk management plan:

Risk management is the act of effectively identifying, analyzing, and managing risks in order to increase success and eliminate threats and investment opportunities for individuals, teams, and enterprises. It is critical for the development and marketing of a project. Natural calamities, business financial uncertainty, and legal responsibilities are only some of the hazards. The five processes of risk management are outlined below. These procedures are put in place immediately to limit the possibility of specific dangers.

A risk management strategy aids in the early detection of threats. Because the chance of failure is minimized, having this form of strategy improves the quality and efficiency of the application. In addition, the application's principal hazard revolves around three factors: time, scope, and cost.

Internal Risk:

Table 10 Internal Risk

Risk	Effect	Solution
Technical Risk	Medium	Staff technicians would take care of any technical concerns. It is critical to identify hazards and their causes so that employees can avoid them in the future.
Resources Risk	High	These initiatives have a scarcity of resources. In order to maximize the utilization of available resources, it is vital to use resources efficiently and prevent wasting them.
System Damage Risk	Medium	To minimize data loss, system maintenance and security measures are essential. Additionally, a backup copy of the project is required.
Time and Cost Risks	High	Each task has strict time and expense limits. Furthermore, stringent scope with project scope demonstrates what aids in completing a project on time and on budget.

External Risk:

Table 11 External Risk

Risk	Effect	Solution
Environmental Risk	High	Make a copy of all of the information needed for the system as a backup.
Cyber Security Risk	High	To avoid cyber security crimes from outside sources, you must have a highly secure system.
Networking Risk	High	Networks are tough to master; it is critical to protect and manage networks from the outset.

Data collection and analysis:

The information gathered came mostly from the majority of disorders whose treatment was linked to diet.

Interviews:

I had an interview with the specialist, Maymona Albaloshi, and the following questions were asked:

- What diseases are caused by a particular diet?
- Does following a diet suitable for the disease help in solving the problem or reducing it?
- How to be sure of a certain type of diet?

Site visits:

I looked on the internet for information on how to make mobile apps and which software is the most user-friendly. The best programming language for the job, as well as how to make a database work with the app.

Literature review:

I searched for articles on how to use Python to parse photos. Also what algorithm should I use to analyze photos and data.

Presenting the findings.

It becomes evident to us here that there are many diseases linked to food that may be avoided by eating in moderation and avoiding foods that are unhealthy for our health.

Interpreting the findings.

Because the application is aimed at everyone, regardless of their technological or technological background, they may benefit from its ease and simplicity. This might help to improve the user experience. This is a prevalent misconception.

Requirements:

External interface requirement:

Because the target audience for this application is between the ages of 15 and 50, the interface should be simple to use. After the application is finished, the user can download it from the Apple Store or the Google Play Store. The application is tailored to the user's technological background, making it simple to use and devoid of complexity.

Functional requirement:

The user can photograph the food labels for the items he wishes to purchase. If the food being purchased is incompatible with the user's health state, the application will notify him.

Non-functional requirement:

The user must log in, enter personal information about his disease, and select a treatment plan. When he takes images of food labels later, the computer will assess the information in light of his medical information.

Performance requirement:

The performance criteria of a software system govern its ability to accomplish specified tasks in specific situations. Examples include program reaction time, throughput, execution time, and storage capacity. End-user task support is a common foundation for service levels with performance standards.

Database requirement:

A database is a set of information. Its goal is to store information and alter it as needed. The following are the most significant needs for a database:

Inserting, organizing, and altering data requires database software.

PostgreSQL is a database-friendly programming language.

Large storage capacity is another necessity for a database. It must hold a significant percentage of the data necessary to operate the program. It also necessitates the storage of historical data that may be needed in the future.

Security requirement:

The following are the security mechanisms utilized in the application:

Encryption: the system must prompt the user to provide a username and password to get access to the system. For security reasons, it's also a good idea to urge the user to update their password every 60 days. Application encryption is a crucial strategy for protecting sensitive data and keeping the application safe from both internal and external threats.

Backup is a typical strategy that practically all businesses employ to prevent data loss in the event of a disaster. Having a backup protects your system and puts you in a secure position.

Maintainability requirement:

Upgrading the phone system, whether Android or iOS, is the most significant necessity for maintenance purposes. It aids in the prevention of systematic mistakes that may have an impact on the application uploading pages.

Usability Requirements requirement:

The usability criteria are met by completing specified stages. These are some of the steps:

- Different segments of training are included in usability training and workshops to explain the application's usability to them.
- User participation in application development processes: adopting this step makes it simpler for users to understand the features and functions of the system.
- Usability testing is a critical method for assuring and assessing the application's usability.

hardware requirements for database: for developer:

Table 12 hardware requirements for database for developer

Hardware	Value
CPU	15 cores, 2.13 GHz
RAM	8 GB
Hard drive	1 TB, with RAID

For user:

Table 13 hardware requirements for database for user

Hardware	Value
Mobile	Android or iOS
Available space	2 GB
Software version	last update of software

Illustrations:

Use case diagram

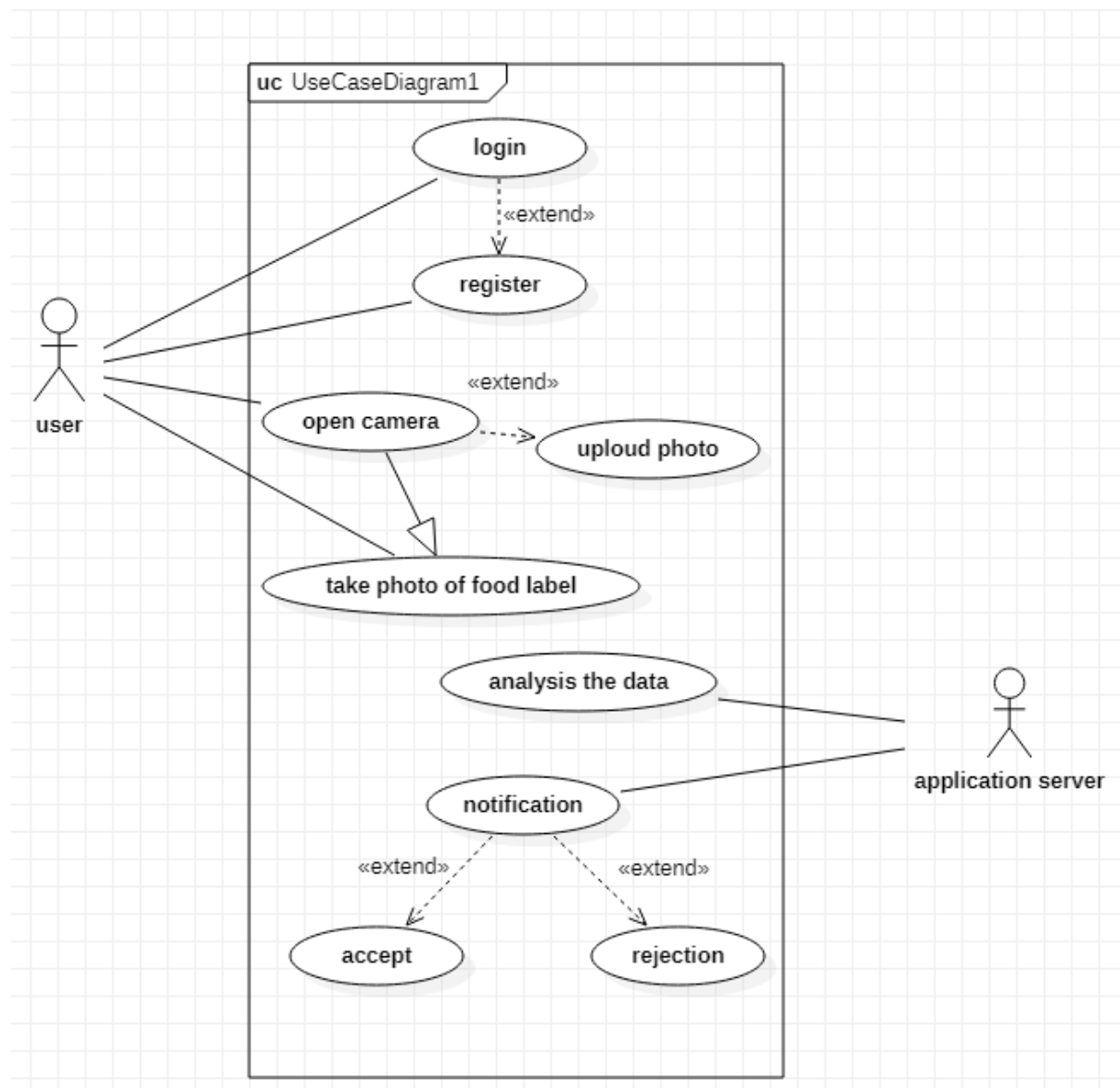


Figure 8 Use case diagram

As shown in Figure 8, the user can log in to the program and then open the camera or upload an image from the phone to be analyzed by the program. The user receives an alert from the program that explains to him whether this meal is commensurate with his health or not.

Sequence diagram

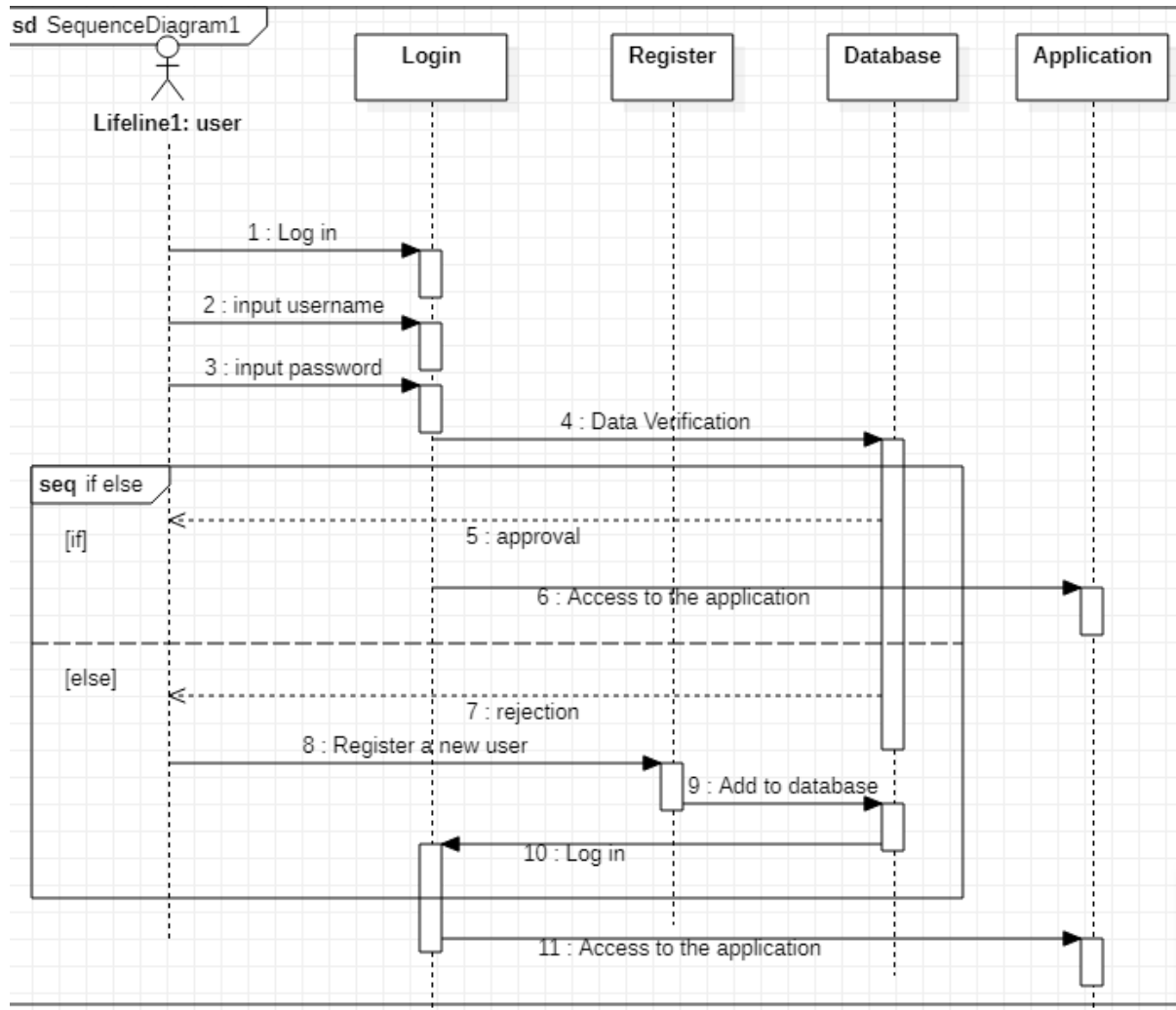


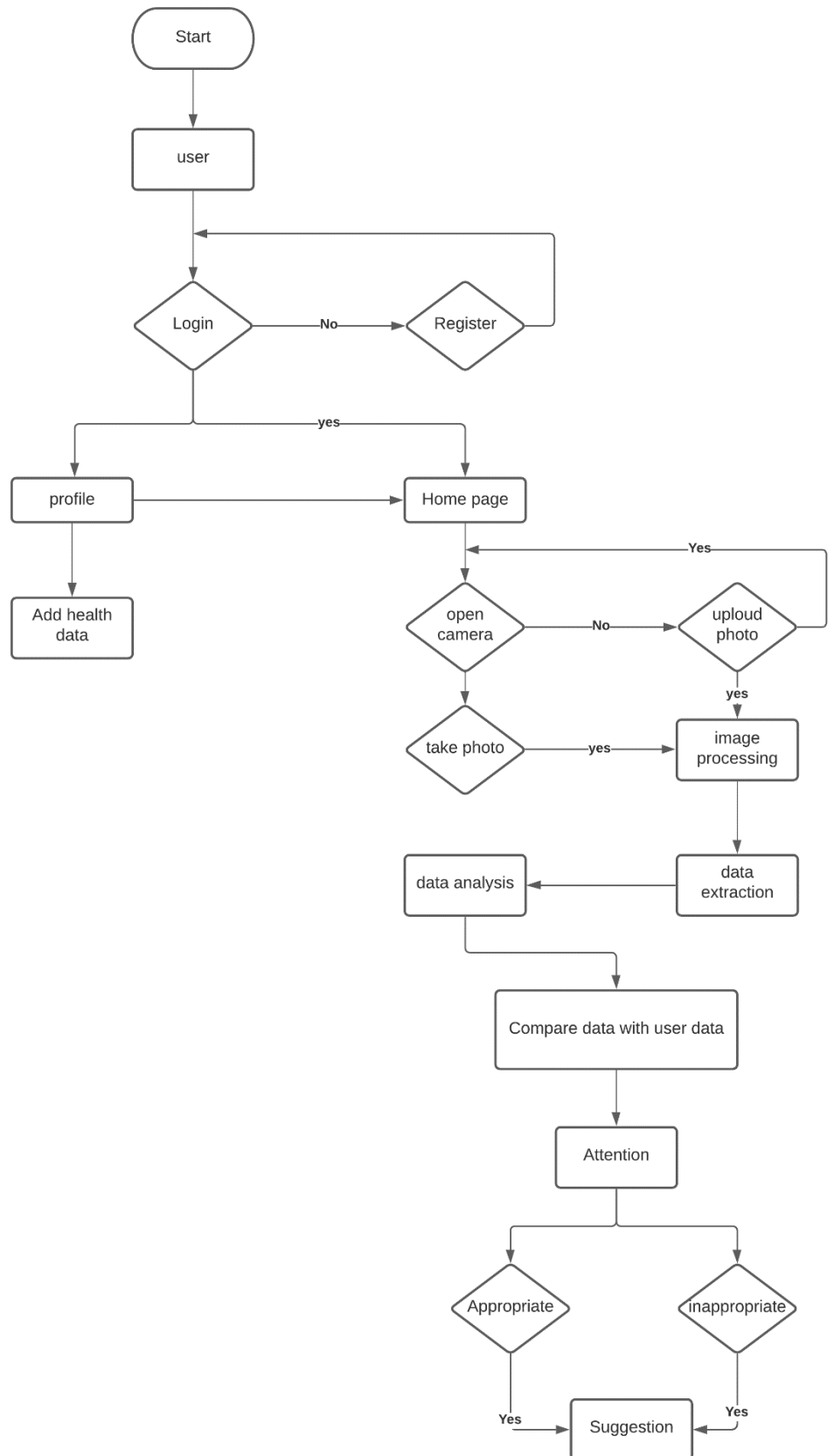
Figure 9 Sequence diagram

As shown in Figure 9, which shows the user registration method for the program. In the event that the user does not have an account, the program requires a new user account to be registered in order to use the program.

System flowcharts:

Figure 10 System flowcharts

As seen in Figure 10, It shows how the application operates. It all starts with logging in and then providing the necessary information. The user is then presented with two alternatives for attaching the picture of the food label. The application then analyses the image and pulls the necessary data from it. The data is then examined and compared to the user's data. Finally, the application will notify the user if the meal is suitable for him or not, and will then provide him with meal selections that are suitable for his health state.



Chapter 4:

Introduction:

Doctor Eyes is an application for smartphones (Android). This application works in the same way as a food specialist. Where he provides nutritional advice to the patient according to his condition.

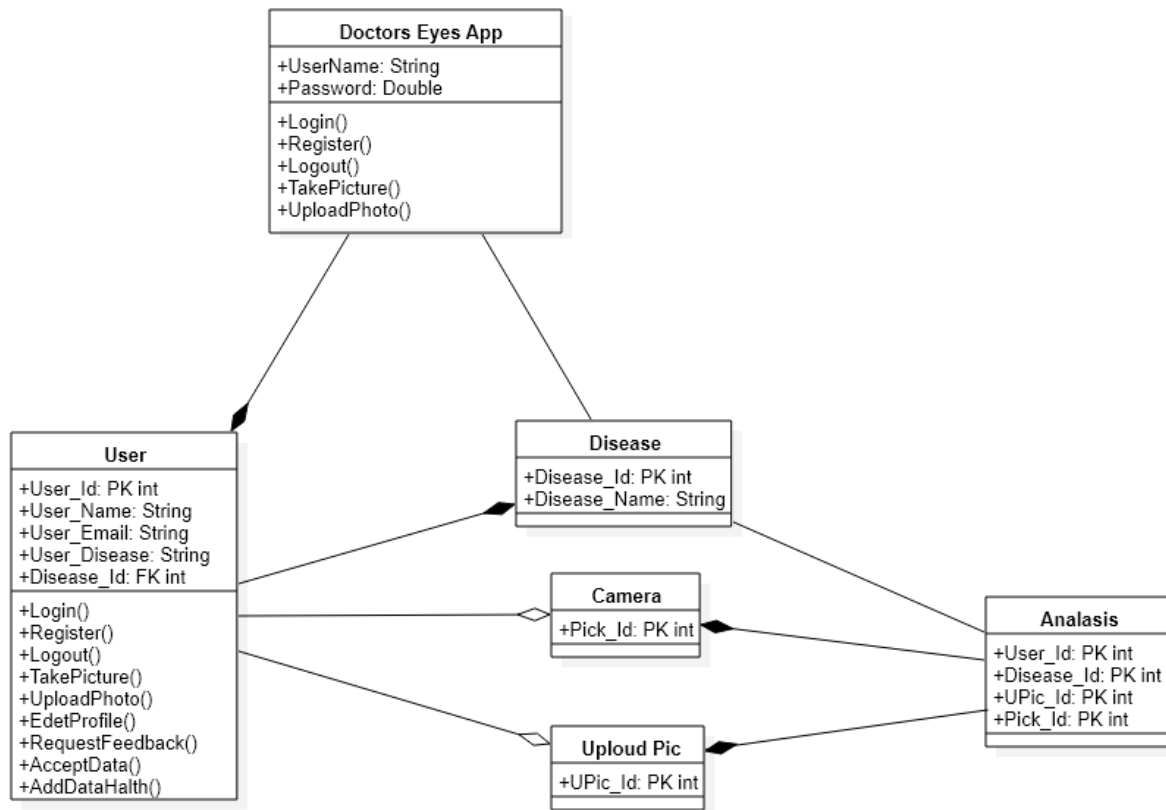
How the application works:

The user registers as a new user account in order to access the program. At first, the program will ask him several questions, including: weight, height, age, gender, type of disease, and allergy in certain foods. After that, the program prepares its profile relative to the data that was previously approved. The user can modify his personal and medical data later. The user opens the camera in the application and gives the program the right to use the mobile camera. Then he takes a picture of the food label and ingredients on the product he wants to buy. The program checks the image if it fits the conditions (quality, the presence of a food card). If the image meets the conditions, the program will accept it, analyze it, and capture the data that fits the patient's data.

In the event that the food product is compatible with the patient's health, the program issues an alert to the user to allow him to take the food product. And if it is not compatible with his health condition.

Class Diagram:

Static structure diagrams include class diagrams. It shows the structure of the system by specifying system classes, attributes, and object relationships.

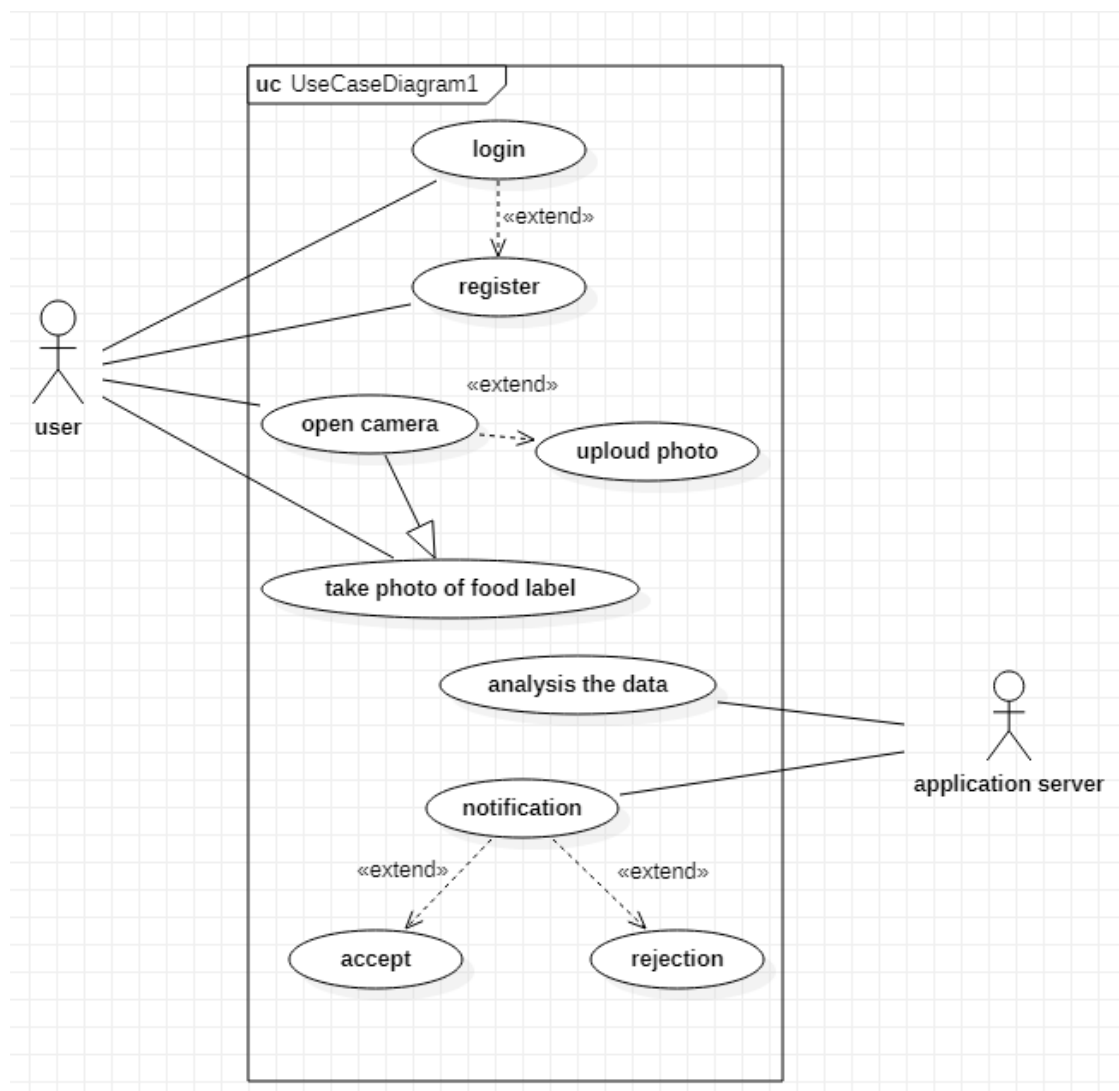


Types of the Relationship:

- Composition relationship between app and user.
- Composition relationship between user and disease.
- Composition relationship between analysis and camera.
- Composition relationship between analysis and upload pic.
- Association relationship between app and disease.
- Association relationship between user and analysis.
- Aggregation relationship between user and camera.
- Aggregation relationship between user and upload pic.

Use case Diagram:

Make use of a case diagram, which is also known as a behavioral diagram. Using actors and use cases, it describes the system's functions. Furthermore, it displays the system's required operations, procedures, and services. Users or entities that play a part in delivering a service or profiting from an established system are referred to as "actors."



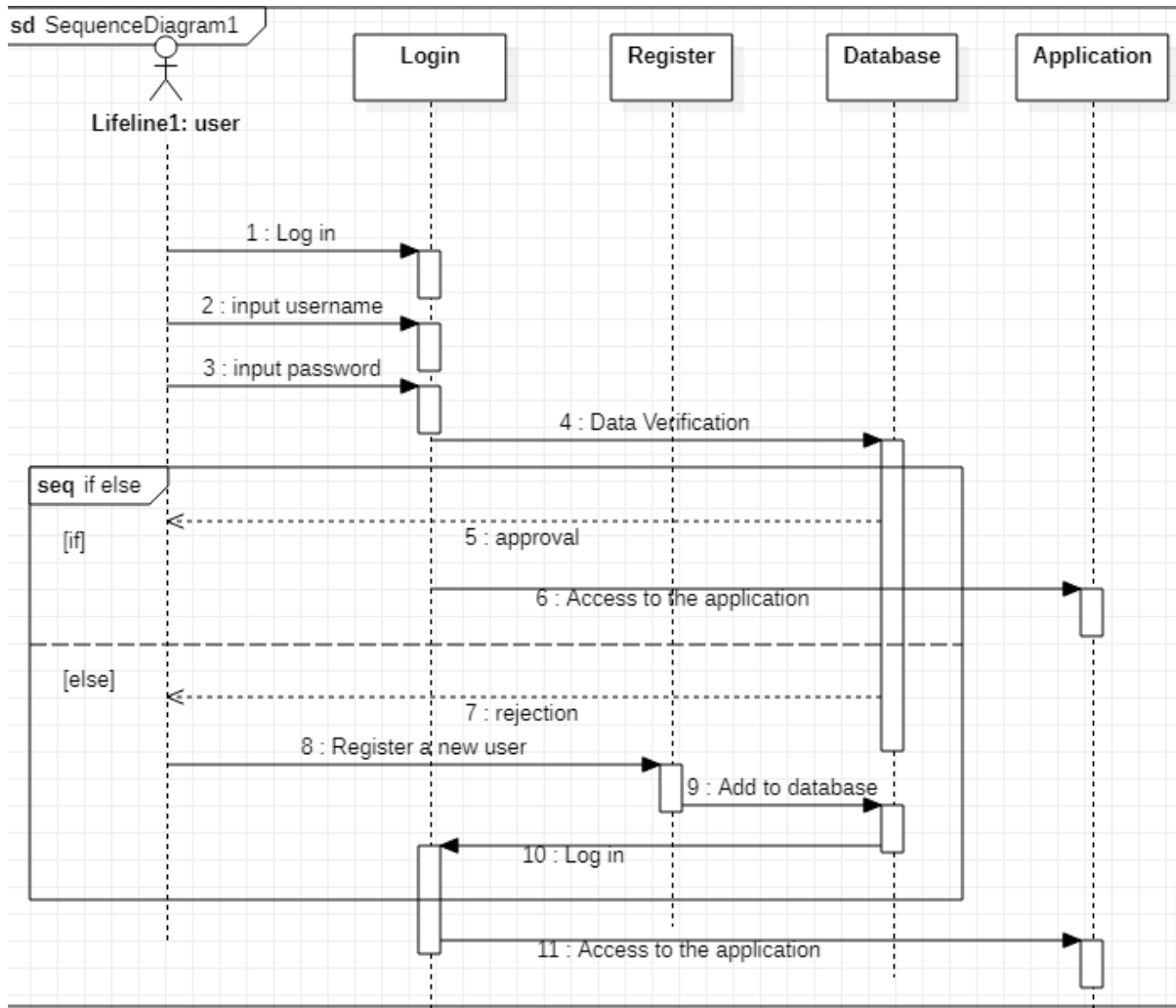
In
this

diagram there are two actors (User and app server), where the actors can access for multiple processes.

As shown in Figure 8, the user can log in to the program and then open the camera or upload an image from the phone to be analyzed by the program. The user receives an alert from the program that explains to him whether this meal is commensurate with his health or not.

Sequence Diagram:

A sequence diagram shows how operations should be carried out. It also depicts how objects interact with one another. Furthermore, it focuses on time to establish the sequence in which things interact. The vertical axis is used to depict this interaction, indicating when the procedure is being communicated and when it is not.

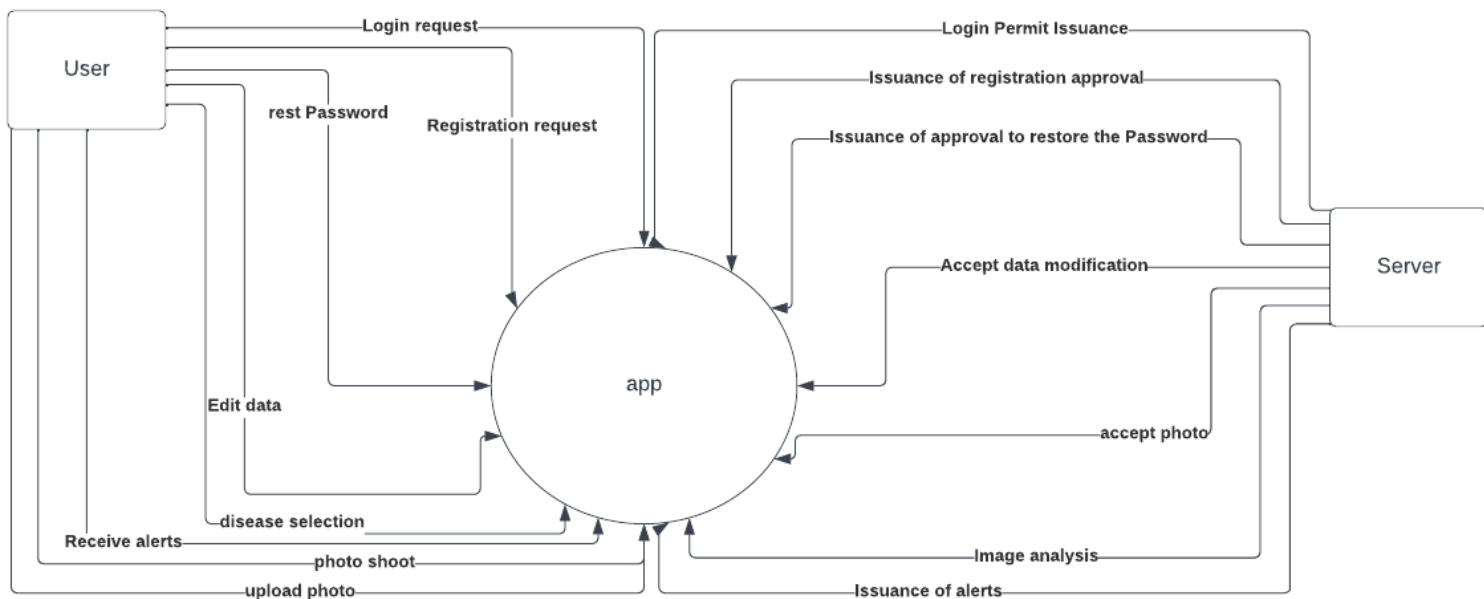


Data Flow Diagram:

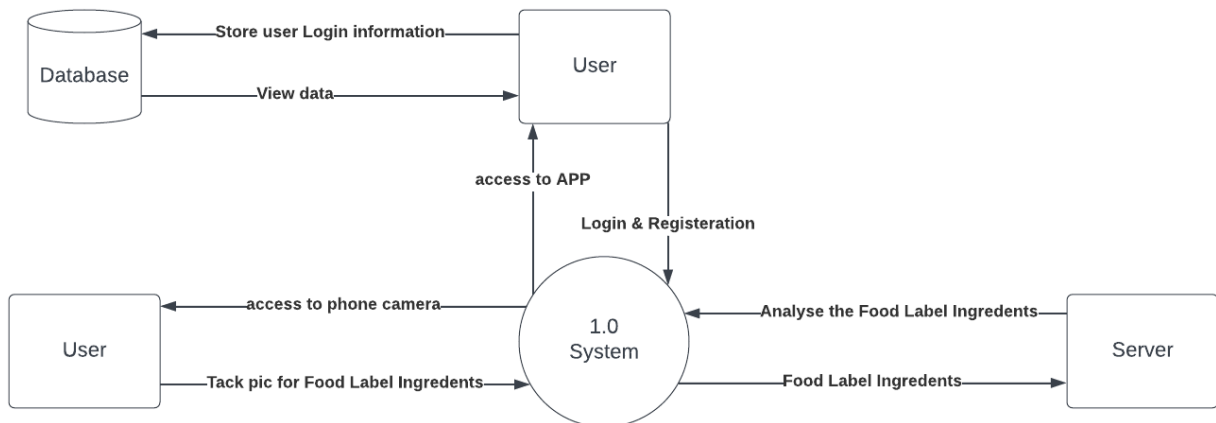
A data flow diagram (DFD) is a visual depiction of a process. It depicts the information flow throughout the information system. The act of transmitting data as input to a file storage system in order to create reports is referred to as report generation. The conceptual and physical designs are separated in DFD. Physical design defines the actual implementation of the logical data flow, whereas logical design explains the movement of information between the systems to accomplish a certain purpose.

Context Diagram:

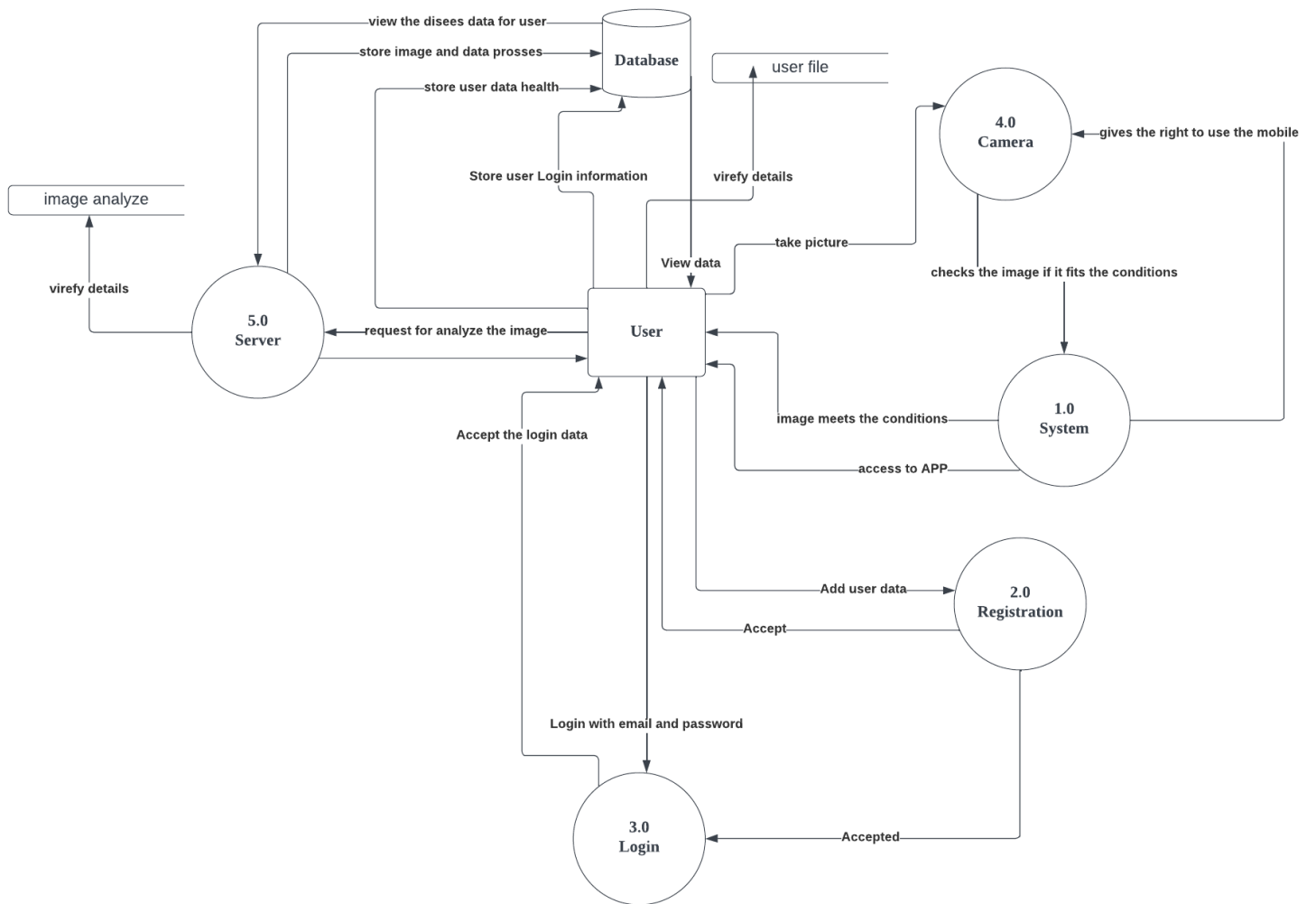
In a particular information system, a context diagram establishes system boundaries by identifying and modeling internal and external elements, as well as their interactions. It's also known as a level 0 data flow diagram. It primarily depicts the exchange of data between the system and external organizations.



DFD (Level 0):

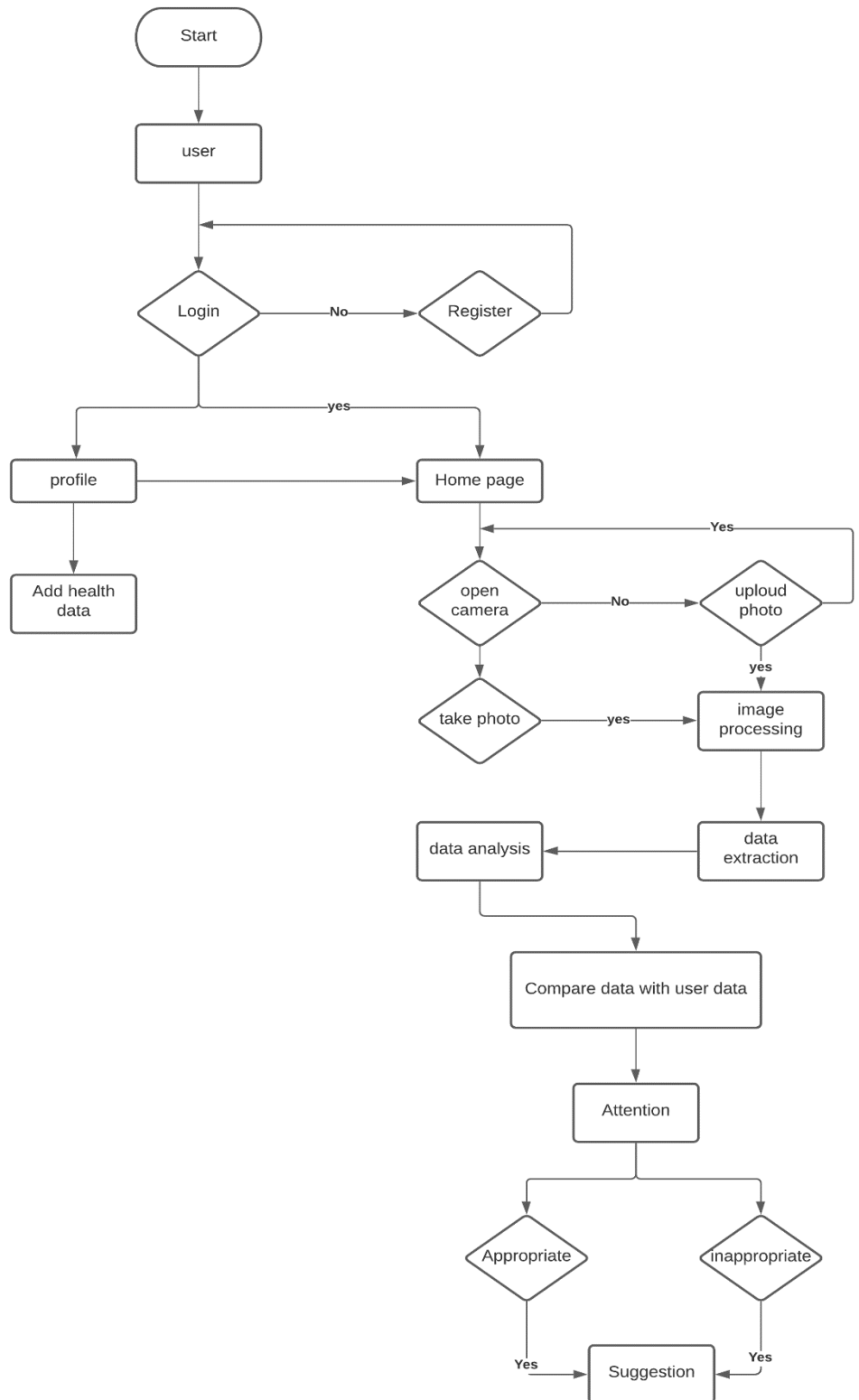


DFD (Level 1):



Flow chart:

A flow chart is a graphic depiction of the stages that must be followed to complete a certain process. Each stage is charted and then linked to the next using directed lines and arrows. The sequence of stages from the beginning to the end of the procedure is depicted by these lines and direction arrows. A flow chart is a business tool that helps you develop and explain processes more efficiently.



Data Dictionary:

Database data is included in the data dictionary. It is essential because it provides information about the database, the individuals who are permitted to access it, and information about the data's physical storage. The data dictionary is not used by system users. It focuses solely on database administrators.

Table 1: User

Field Name	Type	Size	Discription
User_ID	Integer	9	Primary key
User_Name	Varchar	2 (20)	
User_Email	Varchar	40	
User_Food_Allergy	Varchar	2 (20)	
Food_Allergy_ID	Integer	9	Foreign key

Table 2: Disease

Field Name	Type	Size	Discription
Food_Allergy_ID	Integer	9	Primary key
Food_Allergy_Name	Varchar	2 (20)	

Database Auditing:

Database auditing is now required for practically all applications to assure data security and information alignment with the organization's vision, purpose, and strategy. Auditing is described as the process of monitoring and recording certain database user behaviors.

Furthermore, database auditing is commonly used to analyze suspicious acts impacting database content, such as row, table, and column deletion. It also aids in the detection of difficulties with authorized users and users who regulate access. To examine and audit the database, a number of technologies and approaches are employed.

To ensure compliance, database actions must be monitored. Audits should be performed on the data processing language, data modification, data retrieval, database structure, security exception, and data control language. Furthermore, monitoring super user actions is critical to ensuring that information is correctly tracked in accordance with the organization's standards and policies. The following are important auditing requirements:

- **Authentication and User Access:**

This is the point at which a criminal can acquire access to information from either an internal or external business. Super users have the ability to input, modify, add, and remove data.

They have the ability to delete clients' financial data at any moment. An audit is a chance to look into a data breach before it becomes too difficult to handle. It may also apply security setup to prevent losses.

- **data:**

Data is a significant resource for every company. A vast number of people have access to data processing. This information has been altered to make it confidential by authorized users. Tracking user information such as student name, ID, and vehicle ID might be beneficial for future growth.

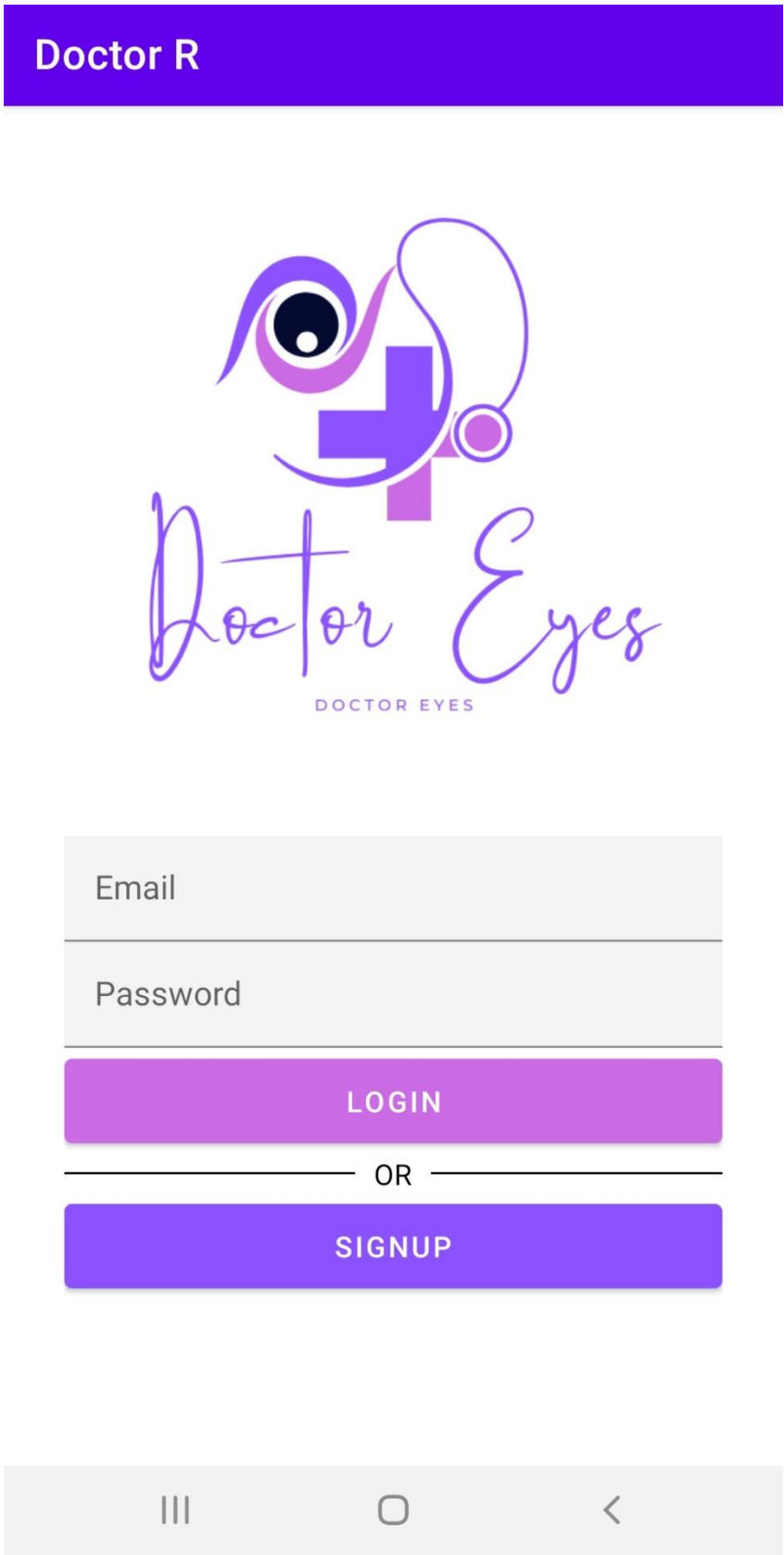
- **network:**

The data is growing by the day as more people utilize mobile applications. As a result, using the public cloud to collect enormous amounts of data has become a must. This public cloud necessitates the use of a network. A thief can acquire access by using stolen data and networks. As a result, it is critical to safeguard and audit network traffic. A network audit aids in the configuration of a better network.

- **Database objects:**

A database object can include information about users and organizations. It also contains information about user access restrictions and privileges. Making illegal claims will not be investigated until the database is reviewed. All views, tables, rows, and operations performed by database users are audited.

Screenshots of application:



Doctor R



Name
ruqaiya

Age
25

Select Your Food Allergies

Sesame

Dont Find Your Food Allergies? Type Hear...

ADD

SAVE



Doctor R



Name
ruqaiya

Age
25

Select Your Food Allergies

Other

Dont Find Your Food Allergies? Type Hear...
starch

ADD

SAVE

Doctor R



Name
ruqaiya

Age
25

Select Your Food Allergies

Other

Dont Find Your Food Allergies? Type Hear...
|

ADD

SAVE

Inserted Successfully

Doctor R



Name
ruqaiya

Age
25

Select Your Food Allergies

starch

Dont Find Your Food Allergies? Type Hear...
|

ADD

SAVE

Chapter 5:



Login & Register Page

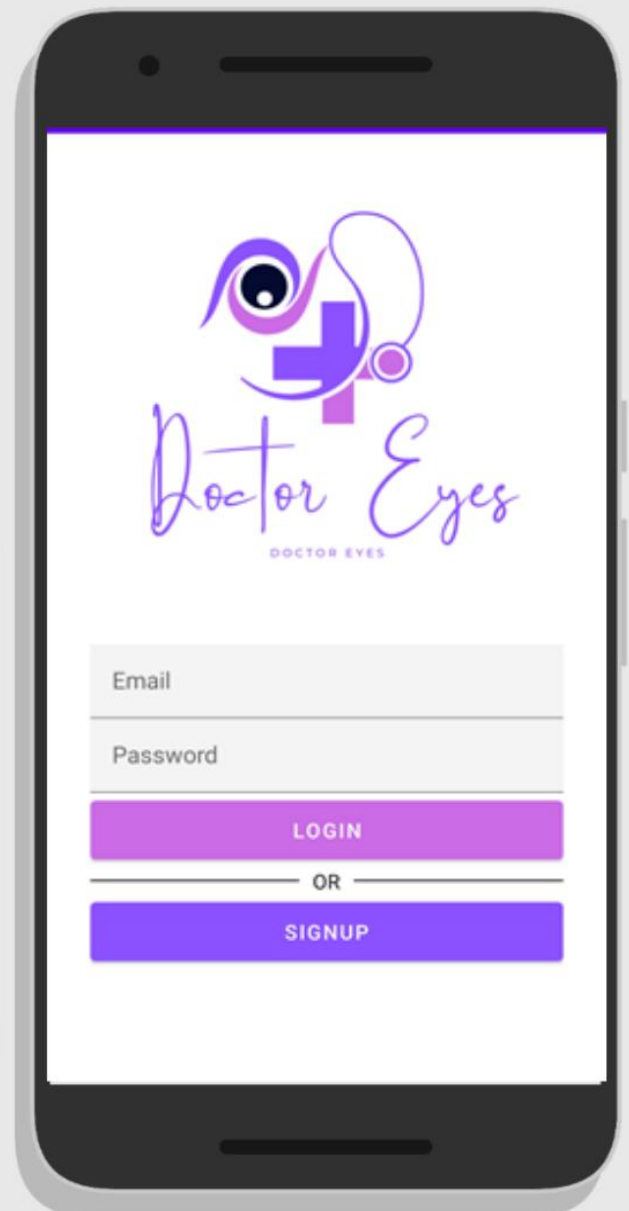
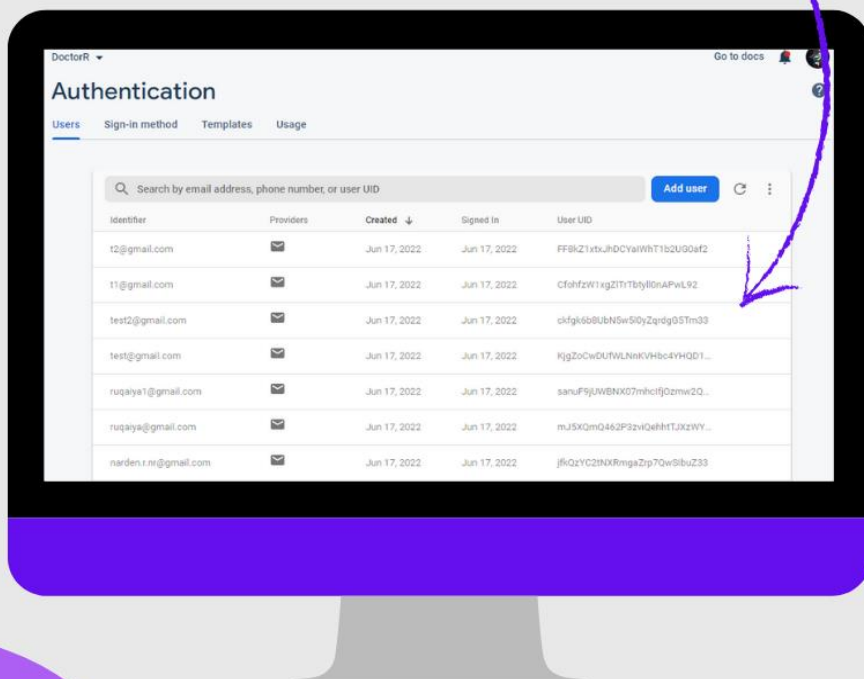
The user enters the email and password to access the home page.

In the case of a new user, he can create a new account by entering the email and password.

In this application the Firebase platform was used.

It is a platform developed by Google for creating mobile and web applications.

When the user creates a new account, it will be added directly in the authentication section so that he can later enter the application.

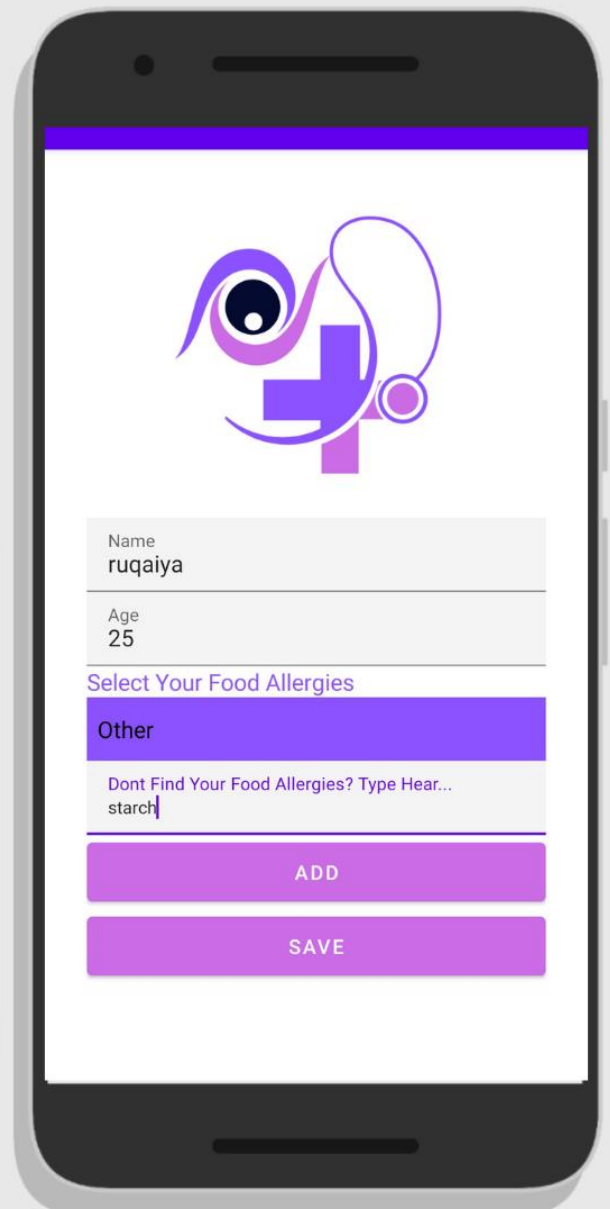
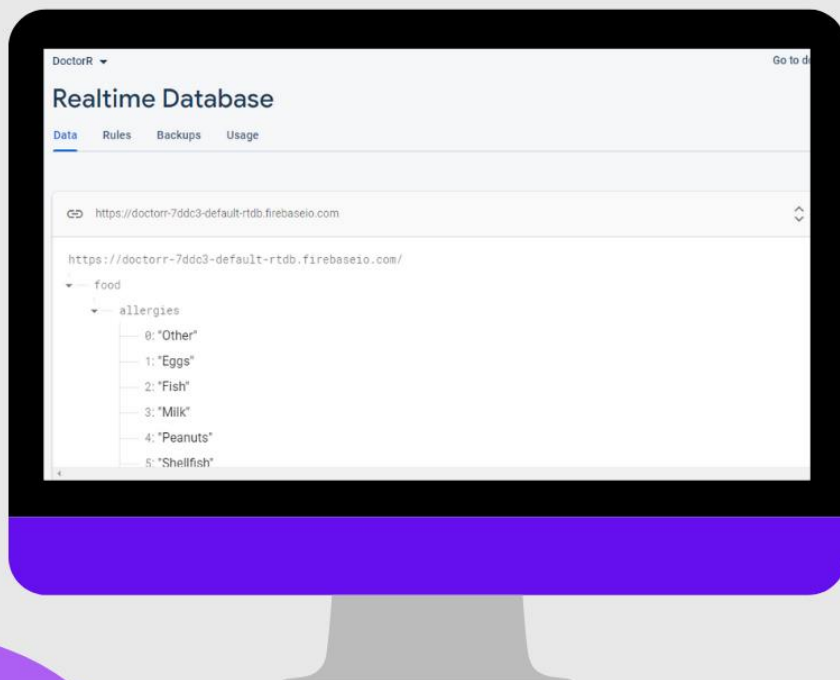


User Data Page



After the user registers a new account it will be taken to the user's health data page. He will enter his name, age, food he is allergic to. If he does not find the type of allergy he has, he can write it down and add it to the list.

After the user inserts a new type of sensitivity it will be stored directly in the database.



Realtime Database



When the user fills in the data it will be saved in the real time database in the user data section.

An alert will appear that the data will be saved in the database, and then the user will be taken to the next page.

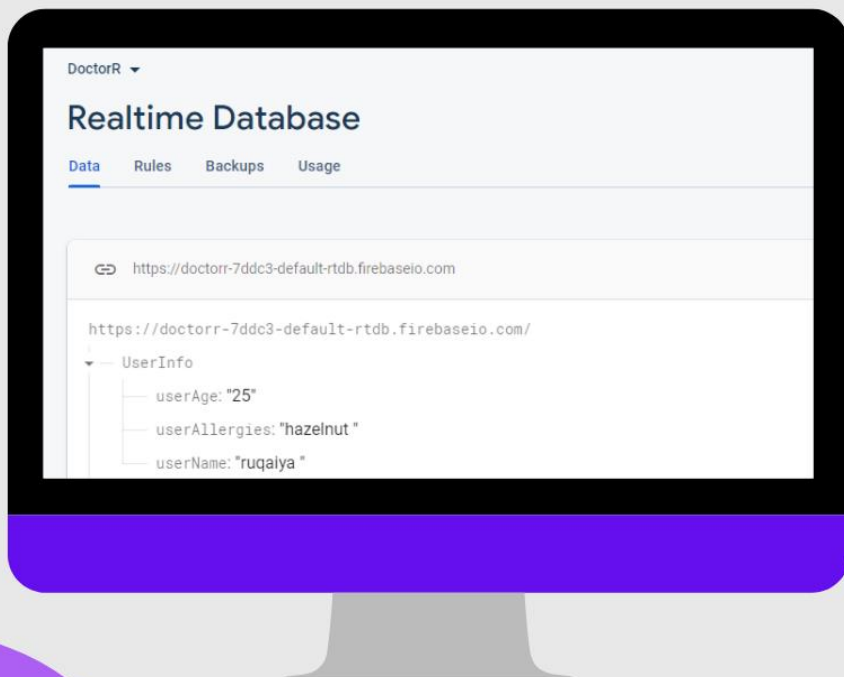
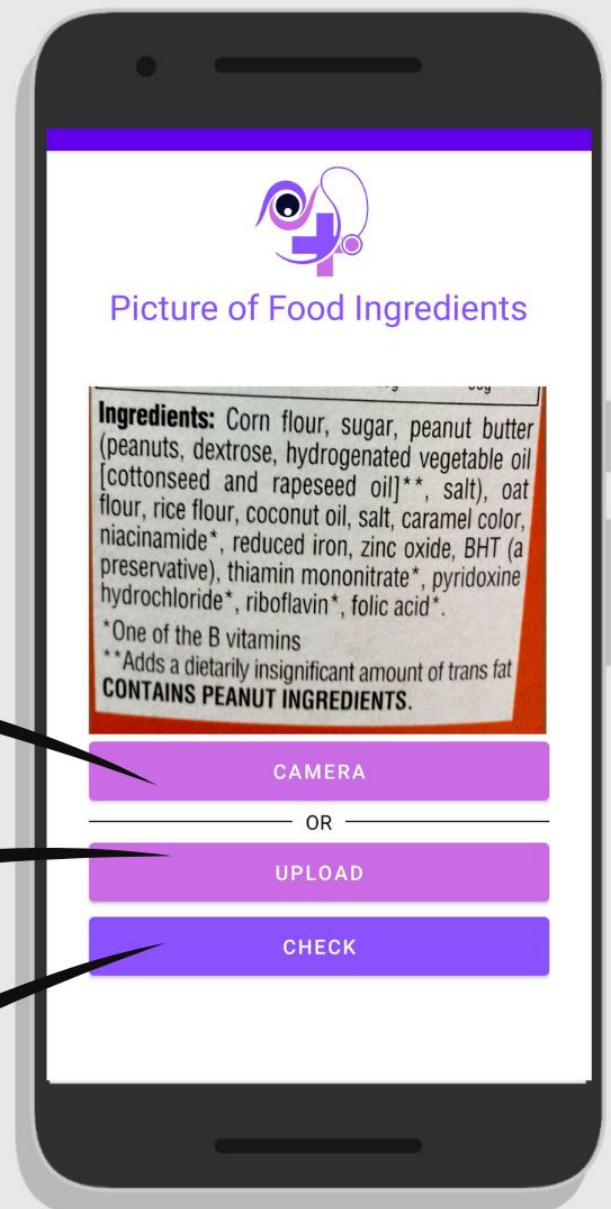
A smartphone screen showing a mobile application interface. At the top is a purple header with a stylized logo featuring a large eye and a cross. Below the logo are two input fields: "Name" with the value "ruqaiya" and "Age" with the value "25". Underneath is a section titled "Select Your Food Allergies" with a purple button labeled "Other". Below that is a text input field with the placeholder "Dont Find Your Food Allergies? Type Hear..." and the value "hazelnut". At the bottom are two purple buttons: "ADD" and "SAVE". A grey toast notification at the very bottom says "data added".

Image Page



On this page the user has two options to attach the food label image of any food product. After that, the program will by machine learning, where the program will recognize the text and extract it from the food label.



Open the camera and take a picture.

Open Gallery and select an image.

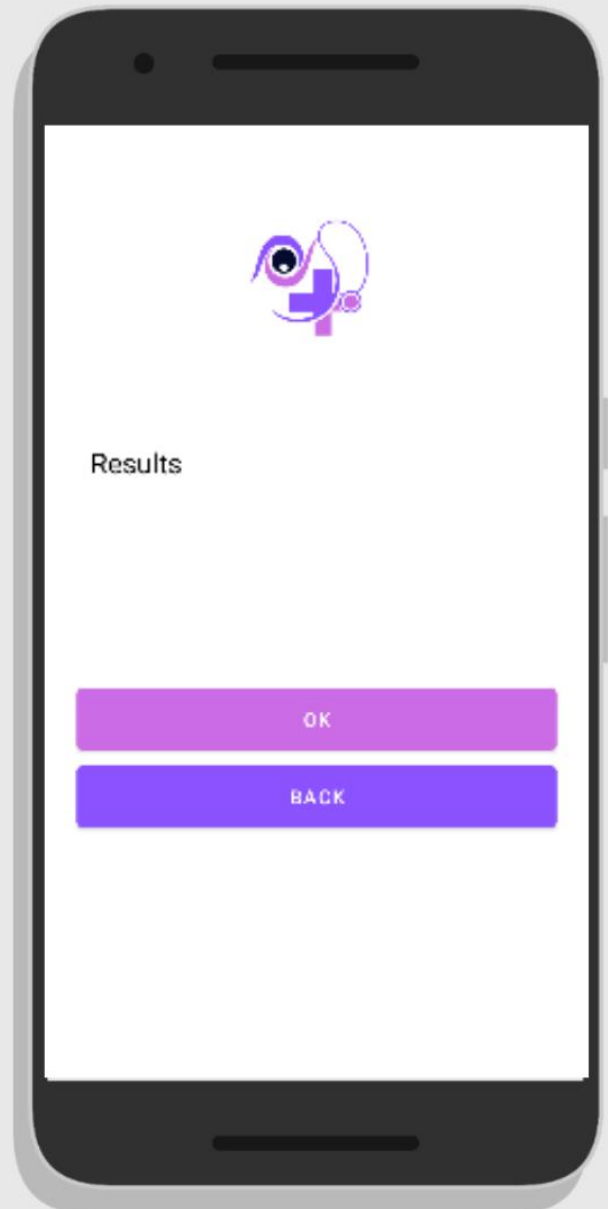
Click on the check button to check the image label.

Check Ingredients Page

After the program extracts the text from the image, the text is compared with the database in the Firebase platform (real-time database - food / allergy) and the user's database is checked to ensure the type of allergy he has.



If the food product contains an ingredient to which the user is allergic, an alert will be issued for its presence. Otherwise, an alert will be issued that the food product is safe.



App Code:

Class Name	Java Code
Page 1: (RealtimeDatabase):	<pre>package com.ruqaiya.doctor; public class RealtimeDatabase { private String UserName; private String UserAge; private String UserAllergies; public RealtimeDatabase() { } public String getUserName() { return UserName; } public void setUserName(String UserName) { this.UserName = UserName; } public String getUserAge() { return UserAge; } public void setUserAge(String UserAge) { this.UserAge = UserAge; } public String getUserAllergies() { return UserAllergies; } public void setUserAllergies(String UserAllergies) { this.UserAllergies = UserAllergies; } }</pre>
Page 2: (Login):	<pre>package com.ruqaiya.doctor; import android.content.Intent;</pre>

```

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.text.TextUtils;
import android.util.Patterns;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import com.google.android.gms.tasks.OnCompleteListener;
import com.google.android.gms.tasks.Task;
import com.google.firebase.auth.AuthResult;
import com.google.firebase.auth.FirebaseAuth;

public class Login extends AppCompatActivity {

    Button signupButtonDR, loginButtonDR;
    EditText emailDR, passwordDR;

    private FirebaseAuth authDR;

    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_login);

        emailDR = findViewById(R.id.name_edt_text);
        passwordDR = findViewById(R.id.age_edt_text);

        signupButtonDR = findViewById(R.id.signup_btn);
        loginButtonDR = findViewById(R.id.save_btn);

        authDR = FirebaseAuth.getInstance();

        loginButtonDR.setOnClickListener(new View.OnClickListener() {

            @Override
            public void onClick(View v) {

                String email = emailDR.getText().toString().trim();
                String password = passwordDR.getText().toString().trim();

                if (TextUtils.isEmpty(email) || TextUtils.isEmpty(password)) {
                    Toast.makeText(Login.this, "Please fill all the fields",
                    Toast.LENGTH_SHORT).show();

```

```

    } else {
        authDR.signInWithEmailAndPassword(email,
password).addOnCompleteListener(task ->
            {
                if (task.isSuccessful()) {
                    startActivity(new Intent(Login.this, MainActivity.class));
                } else {
                    Toast.makeText(Login.this, "Login Failed",
Toast.LENGTH_SHORT).show();
                }
            }
        );
    }
}
);

signupButtonDR.setOnClickListener(new View.OnClickListener() {
    @Override

    public void onClick(View v) {

        String email = emailDR.getText().toString().trim();
        String password = passwordDR.getText().toString().trim();
        if (email.isEmpty()) {
            emailDR.setError("Email is empty");
            emailDR.requestFocus();
            return;
        }
        if (!Patterns.EMAIL_ADDRESS.matcher(email).matches()) {
            emailDR.setError("Enter the valid email address");
            emailDR.requestFocus();
            return;
        }
        if (password.isEmpty()) {
            passwordDR.setError("Enter the password");
            passwordDR.requestFocus();
            return;
        }
        if (password.length() < 6) {
            passwordDR.setError("Length of the password should be more than
6");

            passwordDR.requestFocus();
            return;
        }
        authDR.createUserWithEmailAndPassword(email,
password).addOnCompleteListener(new OnCompleteListener<AuthResult>() {
            @Override
            public void onComplete(@NonNull Task<AuthResult> task) {

```



```

ArrayList<String> list;
ArrayAdapter<String> adapter;
FirebaseDatabase firebaseDatabase;

DatabaseReference databaseReference;
RealtimeDatabase RealtimeDatabase;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_user_data);

    Spinner foodSpinnerDR= (Spinner) findViewById(R.id.spinner);
    Button SaveBtDR= (Button) findViewById(R.id.save_btn);
    Button AddBtDR= (Button) findViewById(R.id.add_btn);

    EditText Name= (EditText) findViewById(R.id.name_edt_text);
    EditText Age= (EditText) findViewById(R.id.age_edt_text);
    EditText foodAllergies= (EditText) findViewById(R.id.food_edt_text);

    db = FirebaseDatabase.getInstance().getReference("/food/allergies");

    firebaseDatabase = FirebaseDatabase.getInstance();

    databaseReference = firebaseDatabase.getReference("UserInfo");

    RealtimeDatabase = new RealtimeDatabase();
    list=new ArrayList<String>();
    adapter=new
ArrayAdapter<>(this,android.R.layout.simple_spinner_dropdown_item,list);
    foodSpinnerDR.setAdapter(adapter);

    AddBtDR.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            String data = foodAllergies.getText().toString().trim();
            db.push().setValue(data)
                .addOnCompleteListener(new OnCompleteListener<Void>() {
                    @Override
                    public void onComplete(@NonNull Task<Void> task) {
                        foodAllergies.setText("");
                        list.clear();
                        fetchdataDR();
                        adapter.notifyDataSetChanged();
                        Toast.makeText(getApplicationContext(), "Inserted Successfully",
Toast.LENGTH_LONG).show();
                    }
                });
        }
    });
}

```

```

fetchdataDR();

SaveBtDR.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {

        String name = Name.getText().toString();
        String age = Age.getText().toString();
        String foodallergies = foodAllergies.getText().toString();

        if (TextUtils.isEmpty(name) && TextUtils.isEmpty(age) &&
TextUtils.isEmpty(foodallergies)) {
            Toast.makeText(UserData.this, "Please add some data.",
Toast.LENGTH_SHORT).show();
        } else {

            addDatatoFirebase(name, age, foodallergies);
        }
    }
});

private void addDatatoFirebase(String name, String age, String foodallergies) {

    RealtimeDatabase.setUserName(name);
    RealtimeDatabase.setUserAge(age);
    RealtimeDatabase.setUserAllergies(foodallergies);

    databaseReference.addValueEventListener(new ValueEventListener() {
        @Override
        public void onDataChange(@NonNull DataSnapshot snapshot) {

            databaseReference.setValue(RealtimeDatabase);
            Toast.makeText(UserData.this, "data added",
Toast.LENGTH_SHORT).show();
        }

        @Override
        public void onCancelled(@NonNull DatabaseError error) {
            Toast.makeText(UserData.this, "Fail to add data " + error,
Toast.LENGTH_SHORT).show();
        }
    });
}

public void fetchdataDR()
{

```

```

listener=db.addValueEventListener(new ValueEventListener() {
    @Override
    public void onDataChange(@NonNull DataSnapshot snapshot) {
        for(DataSnapshot food : snapshot.getChildren())
            list.add(Objects.requireNonNull(food.getValue()).toString());
        adapter.notifyDataSetChanged();
    }

    @Override
    public void onCancelled(@NonNull DatabaseError error) {

    }
});
}
}

```

Page 4: (Image):

```

package com.ruqaiya.doctor;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class Image extends AppCompatActivity {
    Button camera_butn, upload_btn, check_btn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_image);
        camera_butn = findViewById(R.id.camera_butn);
        upload_btn = findViewById(R.id.upload_btn);
        check_btn = findViewById(R.id.check_btn);

        camera_butn.setOnClickListener(new View.OnClickListener() {
            @Override

            public void onClick(View v) {

                startActivity(new Intent(Image.this, Image.class));

            }
        });

        upload_btn.setOnClickListener(new View.OnClickListener() {
            @Override

            public void onClick(View v) {

                startActivity(new Intent(Image.this,
checkIngredients.class));

```

```

    }
    } );

    check_btn.setOnClickListener(new View.OnClickListener() {
        @Override

        public void onClick(View v) {

            startActivity(new Intent(Image.this, Image.class));

        }
    } );

}
}

```

Page 5:
(checkIngredients):

```

package com.ruqaiya.doctor;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class checkIngredients extends AppCompatActivity {
    Button ok_btn, back_btn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_check_ingredients);
        ok_btn = findViewById(R.id.ok_btn);
        back_btn = findViewById(R.id.back_btn);

        ok_btn.setOnClickListener(new View.OnClickListener() {
            @Override

            public void onClick(View v) {

                startActivity(new Intent(checkIngredients.this,
Image.class));

            }
        } );

        back_btn.setOnClickListener(new View.OnClickListener() {
            @Override

            public void onClick(View v) {

                startActivity(new Intent(checkIngredients.this,
Image.class));

            }
        } );
    }
}

```

	<pre> }); } } </pre>
<p>Page 5: (RealtimeDatabase):</p>	<pre> package com.ruqaiya.doctor; public class RealtimeDatabase { private String UserName; private String UserAge; private String UserAllergies; public RealtimeDatabase() { } public String getUserName() { return UserName; } public void setUserName(String UserName) { this.UserName = UserName; } public String getUserAge() { return UserAge; } public void setUserAge(String UserAge) { this.UserAge = UserAge; } public String getUserAllergies() { return UserAllergies; } public void setUserAllergies(String UserAllergies) { this.UserAllergies = UserAllergies; } } </pre>

Testing & Evaluation:

Software testing is the process of assessing and confirming that a software product or program accomplishes what it is supposed to do. Testing benefits include avoiding mistakes, saving development costs, and improving performance.

Strategy for Testing:

A test strategy is a set of suggestions that explain the test design and how it should be carried out.

The goal of the test strategy is to identify the testing methodology, types of tests, testing environments, and tools to be used, as well as the high-level details of how the test strategy will be integrated with other processes. The test strategy document is intended to be a living document that will be updated as we acquire clarity on requirements, test environment, build management approach, and other factors.

Test Case Template				
Steps				
S.NO	Description	Expected Output	Actual, if different from Expected	Remarks P/F
1.	Technical Test <ul style="list-style-type: none">• Layout• Navigation• Database Connectivity• Programs	Error Free	As per expected result	Pass
2.	Functional Test <ul style="list-style-type: none">• Database (Add / Delete / Update / Retrieval / Display)• User Interface functionality (Using Scripting Feature or User Interface Design)	Error Free	As per expected result	Pass
3.	Operational Test <ul style="list-style-type: none">• Package / Deployment	<ul style="list-style-type: none">• Display of Information / Contents• Successful Installation, Running, Implementation• Proper Retrieval of Database	As per expected result	Pass

Deployment:

Deployment is described as a collection of process implementations aimed at making a software system available to consumers. These tasks are carried out by developers, end users, or both.

It is described as all of the procedures necessary to set up and run a certain software environment under a specific concept of software deployment. System software deployment involves installation, setup, testing, and performance support. The key advantages of deployment are that it saves time, improves security, monitors user behaviors, and effectively updates software. Deployment processes become faster since no training or experience is required. For quick implementation, many formulations can be employed. Furthermore, the deployment can set up authorization roles to control the computer system. To sensitive or sensitive activities, many security procedures may be used.

User Skill and Expertise Level:

The ability to operate system software is the most critical skill for a user. Experience is built on the use of several systems at various periods. Many organizations often incorporate consumers into the development process. As a consequence of his involvement, he will gain knowledge and expertise in dealing with this system. Furthermore, the software package includes instructions that provide the user with an overview of how to utilize this system software.

User Training:

One simple approach to providing user training is through user engagement. The development team must obtain as much information as possible about the target end users. Because end users validate their abilities and skills in utilizing the system software, the system should be simple to use. Also included in the user's training is involvement in the examination of system use cases to identify any problems in the system software. Training is a critical component in ensuring that users are able to utilize this technology.

Critical Evaluation:

The capacity to analyze and evaluate a key skill connected to several areas is termed "critical evaluation." The assessment process includes analysis. It is divided into several sections. It establishes a channel of communication between ideas and practices and demonstrates information linkages. Furthermore, criticism includes other people's thoughts and remarks on the system software as well as proof to back up such viewpoints. The task of evaluating entails recognizing strengths and shortcomings as well as appraising the viewpoint and argument.

Ethical, Social and Legal Issues:

Because of acceptance regulations and rules, information technology outputs are validated from one jurisdiction to the next. The usage of computers, storage, and networking has skyrocketed. As a result, it aids in increasing the number of users, whether people or businesses. usage of information technologies that are communicated, copied, and processed across the Internet. This puts privacy and intellectual property protection at risk. The major concerns that may have an impact on the ethical, social, and legal elements are discussed below.

Ethical Issues:

Copyright and licensing concerns are ethical dilemmas. Furthermore, the majority of the ethical challenges include intellectual property rights and electronic surveillance of data consumption and employees. An ethical plan is a necessary activity that must be completed before beginning work on a certain project. The information presented must be gathered in a systematic manner without taking any knowledge or ideas from others without attribution. A programming language, for example, may have a license that others may not attach to this work. Others' stolen activities might raise ethical concerns. The thief will face a variety of penalties imposed by various government agencies and authorities.

Social Issues:

Social issues bind societies together. It is determined by how happy users are with the system software. System software should terrify all users. Regardless of what they own or their social status, everyone has the same degree of user privilege. Furthermore, the system software must ensure that the system has no detrimental influence on other people. Ascertain that the system's software will assist all intended users without hurting others who may have a special project in that region or that the system would cause their firm to discontinue operations due to the sector's monopoly.

Legal Issues:

Government laws, concepts, and guidelines control legal matters in Oman. Having a license for anything developers do will keep them out of legal trouble. Any mistakes or violations of government laws might put a halt to any form of endeavor. In addition, approved government bodies must identify and license system software innovations.

Chapter 6:

Restating aim

We aimed to create a comprehensive and automated food screening application for the user, with quick and convenient access to the program's functionalities for all patients and their families. There are several advantages that this program will bring by ensuring that the selected meal is appropriate for the patient's health.

Summarizing the key results

In my project, I employed two primary methods: online research and meeting with a food professional. Several questions were asked during the interview. I sum everything up and reach the following conclusions: According to the findings, the most prevalent food-related allergies affect between 30 and 40 species.

Evaluating the contribution of the project (practical applications)

The Application of Food recommendation system will present directive services for those who are allergic to any type of food.

Discussing the application of the system

The user registers as a new user account in order to access the program. At first, the program will ask him several questions, including: weight, height, age, gender, type of disease, and allergy in certain foods. After that, the program prepares its profile relative to the data that was previously approved. The user can modify his personal and medical data later. The user opens the camera in the application and gives the program the right to use the mobile camera. Then he takes a picture of the food label and ingredients on the product he wants to buy. The program checks the image if it fits the conditions (quality, the presence of a food card). If the image meets the conditions, the program will accept it, analyze it, and capture the data that fits the patient's data.

In the event that the food product is compatible with the patient's health, the program issues an alert to the user to allow him to take the food product. And if it is not compatible with his health condition.

Starting the limitations of the application

1. A substantial expenditure is required for system development and physical reactions to processing systems.
2. To fulfill system objectives, highly skilled programmers and developers are necessary.
3. Due to scheduling constraints, the program is only available for the Android operating system.
4. The size of mobile phone devices is regarded as a key design and storage capacity barrier.

Impact of the project

The primary purpose of the project is to keep the project safe for both internal and external users. Before beginning a project, I research all potential impact variables from all angles. The following sections explore the social, ethical, and legal implications.

Describing the social impact

During the process of creating the application's system software, I aim to guarantee that the system will not be negatively impacted by other individuals and that it will benefit all target customers without harming others who may own a specific project in that field.

Describing the ethical impact

I keep in mind while getting material from various resources such as websites or books to have a clear method without taking any sort of information or ideas from others without referencing them and citing their efforts.

Describing the legal impact

To avoid legal problems, every designer program or developer must obtain a license. Because any faults or violations of government legislation might halt construction on any project. It should also get a license from approved government bodies for the system software innovation.

Describing sustainability aspects

Continuous tracking feedback is essential for maintaining a viable project. That input is critical to project development. Furthermore, managing the physical materials for maintenance purposes is an important aspect to make the project viable for as long as feasible. Furthermore, the application should be updated on a regular basis to avoid further scams.

WEEKLY PROJECT DIARY

Student ID: *15s13438*

Name: *Ruqaiya Khalid ALOfi*

Project Title:

(Mobile app Food Recommendation system for disease using machine learning algorithms)

Week No **10**

Tasks:

1. Link the Machine Learning to the application.
2. Link the Real-time Database to the application.
3. firebase Authentication.

Work Done: **

1. Done with the linking and add Text recognition from firebase to the application.
2. Complete the linking with the Real-time Database from firebase to the application.
3. Test the linking in Authentication.

WEEKLY PROJECT DIARY

Student ID: *15s13438*

Name: *Ruqaiya Khalid ALOfi*

Project Title:

(Mobile app Food Recommendation system for disease using machine learning algorithms)

Week No **13**

Tasks:

4. Link the project with firebase ML to Recognize Text in Images Securely with Cloud Vision using Firebase Auth and Functions on Android.

Work Done: **

4. Done with the linked.

WEEKLY PROJECT DIARY

Student ID: *15s13438*

Name: *Ruqaiya Khalid ALOfi*

Project Title:

(Mobile app Food Recommendation system for disease using machine learning algorithms)

Week No **9**

Tasks:

5. Try to solve the echo in the page 3.

Work Done: **

5. Done with the testing and the result for third page is true.

Remarks: ***



Certificate of Ethical Approval

RollNumber 15S13438

Student Name RUQAIYA KHALID NASSER SAID AL OFI

Semester 2021 Fall

Project Title

Mobile app Food Recommendation system for disease using Machine Learning Algorithms

This is to certify that the above named student has completed the Middle East College Ethical Approval process and their project has been confirmed and approved as Low Risk.

Supervisor Jayakumari Chitathukattle

Date of Approval Dec 29, 2021

Document Name & Type	Student Declaration for coursework Form	Author/Department	Head, Centre for Academic Practices
Approval Date	14/05/2020	Effective Date	14/05/2020
Review Date	12/05/2020	Next Review Date	11/05/2021

Student Declaration for Coursework

(To be scanned and attached with coursework report after signing)

I/We confirm that this submission is part of a coursework (as chosen below) undertaken in semester **Fall-21** towards completion of the following module:

Module Name and Code: **Project Planning (Fall 2021 - F21 PROJS 30001.1)**

(Please tick the correct choice below)

- Individual Assignment or Case Study
- Group Assignment or Case Study/Mini Project (*in this case, all members have to sign below in space provided*)

I/We declare that the coursework report and artifacts submitted by me/us are original, duly written and prepared by me/us and has not been copied or taken in part or in whole from any other source except where duly acknowledged. All use of previously published work (from books, journals, magazines, internet sources etc.) has been acknowledged within the main report to an item in the References or Bibliography lists. I/we also agree that an electronic copy of this report and artifacts may be stored and used for the purposes of prevention and detection of all types of academic integrity violations.

I/We also acknowledge that I am/we are aware of MEC Student Academic Integrity Policy and Research Ethics and Biosafety Policy and the disciplinary action that shall be taken in case of violation of the policies. Further, in case of group work each of us in the group are equally responsible for the group component and liable for application of penalty on policy violation.

Student ID, Name and Sign: RUQAIYA KHALID ALOFI / 15s13438 /RUQAIYA

Date: 10/01/2021