**Project report**

**NUTRITION ASSISTANT APPLICATION**

**PROJECT ID: PNT2022TMID42897**

**Submitted by –**

|  |  |
| --- | --- |
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**1.INTRODUCTION:**

**1.1Project Overview:**

Good nutrition promotesnot only better physical health and reduced susceptibility to disease, but has also been demonstrated to contribute to cognitive development and academic success. Left to their own devices, children will not automatically select healthy foods.

Nutrition is the process of consuming, absorbing, and using nutrientsneeded by the body for growth, development, and maintenance of life. To receive adequate, appropriate nutrition, people need to consume a healthy diet, which consistsof a variety of nutrientsthe substances in foods that nourish the body.

Living a healthy lifestyle can help prevent chronic diseases and long-termillnesses. Feeling good about yourself and taking care of your health are important for your self-esteem and self-image. Maintain a healthy lifestyle by doing what is right for your body.

At last I want to conclude that food and health both are related to each other. Our health depends upon what food we eat and how much we eat. Thereforewe should be careful while eating.

For all these needsour platform supportsto lead a healthy life.

**1.2Purpose**

Nutrition assistant application helps dieticians with providing proper nutritionat healthcare facilities. It determine nutritional needs and assets risk factors.Nutritional assessment allows healthcare providers to systematically assess the food diagnose malnutrition, identify underlying pathologies in food that lead to malnutrition, and plan necessary interventions.

Nutrition apps can help make life easier for individuals who need to track their food intake for health reasons. Eating a balanced diet is not always easy, especially when eating out, trying to cook new recipes,or managing the demands of a busy life.

**2**.    **LITERATURE SURVEY**

**2.1 Existing Problem:**

In this pandemic situation, we need to lead a healthier life by means of taking healthier intake of foods .But in our fast moving world while we taking food we can’t find a chart

and check whetherthe food is nutritional food or not.Thus to overcome that risky we created a application known as nutrition assistant application.

* 1. **References:**

* + 1. Adnan Shehzad , Hui Su , Jin Lui , Si Chin , Zhidong Shen

(2019) “Machine LearningBased Approach on Food Recognition and `Nutrition Estimation”, International Conference On Identification, Information And Knowledge In The Internet Of Things(IOT)(IIKI2019).

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    2. Bojia Qiu , Chenxi Huang , Kunhui Lin , Landu Jiang , XueLiu (2022) “Deep Food: Food Image Analysis and Dietary Assessment via Deep Model”,International Journal Of Scientific And Engineering Research.

* + 1. Djilani Kebaili, Eric Antoine Scuccimarra,Gaurav Singhal, Harris Heritier,Marcel Salathe, Sharada Prasanna Mohanty, Victor Boulanger (2016) “The Food Recognition Benchmark: Using Deep Learning to Recognize Food in Images”,International Conference On Identification And Knowledge On IOT.
    2. Hazum Kemal Ekenel , Marwa Qaraqe , Seymanur Aktr (2016) “A Mobile Food Recognition System for DietaryAssessment”, International Conference On Identification And Knowledege On IOT.
    3. Hui Deng , Jianbo Wu , Xianghui Zeng , Ying Wang (2021) “A Comprehensive Survey of Image-Based Food Recognition and Volume Estimation Methods for DietaryAssessment”, International Conference on Journal Publication.
    4. Manpreetkour Basantsingh Sardar , Dr.Sayyad D.Ajij (2016) “Fruit Recognition and its Calorie Measurement: An Image Processing Approach”, International Journal Of Engineering And Computer Science.

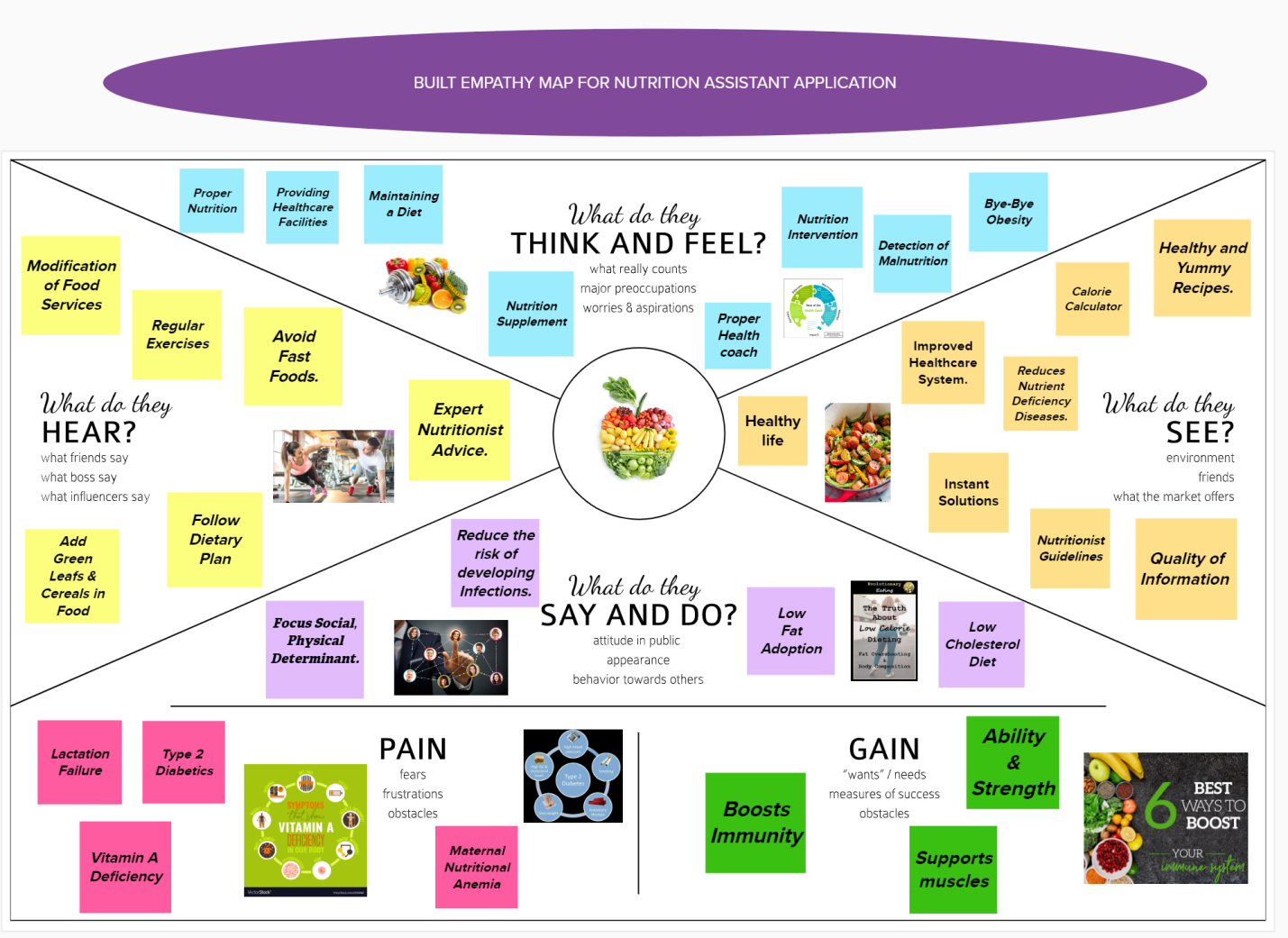
* 1. **Problem statement definition:**

A problem statement is a concise description of the problem or issues a project seeks to address. The problem statement identifies the current state, the desired future state and any gaps between the two. A problem statement is an important communication tool that can help ensure everyone working on a project knows what the problem they need to address is and why the project is important.

A problem statementis important to a processimprovement project becauseit helps clearlyidentify the goals of the project and outline the scope of a project. It also helps guide the activitiesand decisions of the people who are working on the project. The problemstatement can help a businessor organization gain support and buy-in for a processimprovement project.

**3.IDEATION AND PROPOSED SOLUTION:**

**3.1 Empathy Map Canvas:**



An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gainedmuch popularity withinthe agile community.

**3.2 IDEATION AND BRAINSTORM**

Define your problem statement:

What problemare you trying to solve?Frame your problemas a How Might We statement. This will be thefocusof your brainstorm.

**PROBLEM**

In this pandamicsituation,we are in need to eat a healthy food.But in thisfastest world wecan't carryanutrition chart to every place to identifythe healthy.

**Group ideas:**

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label.If a cluster is biggerthan six stickynotes, try and see if you and break it up into smaller sub-groups.

**Prioritize:**

Your team should all be on the same page about what’s important moving forward. Place your ideas on this grid to determine which ideasare important and which are feasible.

**3.3 PROPOSED SOLUTION:**

Proposed SolutionTemplate: Project team shall fill the followinginformation in proposedsolution template.

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Parameter** | **Description** |
| 1. | Problem Statement (Problem to be solved) | Rate of Obesity are increasing at an high speed,due to the ignorance of the proper Nutrition foods, and this leads to risks in people's health. People need to control their daily calorie intake by eating healthier foods, which is the most basicmethod to avoid obesity.However,some foodpackaging has an |

|  |  |  |
| --- | --- | --- |
|  |  | added nutrition and calorie values,but it's not very comfortable to refer. |
| 2. | Idea / Solution description | People can easily track the Nutrition and calories by scanning an real-time images of a food and examine it's nutritional content which will improves the dietary habits.Smart nutrition and foodscan prevent diseases. This app will provide proper nutrition,helps in maintaining a healthy  lifestyle and also recommended diet plans for users. |

|  |  |  |
| --- | --- | --- |
| 3. | Novelty / Uniqueness | This solution has the uniqueness that we can realize real time imagesof meal and can easily  analyze its nutritional |
|  |  | content. A web app that can automatically estimates food attributes such as ingredients and nutrition value by classifying the input  image. |
| 4. | Social Impact / Customer Satisfaction | The Obesity rate will get reduced and people can able to lead a healthy life. It helps achieve and maintain a healthy weight. |

|  |  |  |
| --- | --- | --- |
| 5. | Business Model (Revenue Model) | Social media is the best way to develop this application. This application will increase the confidence among the people. It is great to use, amazing convenience and also have subscription onceuser hit certain  services. |
| 6. | Scalability of the Solution | People can access fromanywhere at anytime to track the calories and |
|  |  | nutrition value that will improve a healthy eating pattern. This App will improves the dictary habits and helps in maintaining a healthy weight and healthy lifestyle. |

**3.4 Problem Solution Fit:**

**4.REQUIREMENTS :**

**4.1**  **Functional Requirements:**

           Following are the functional requirements of the proposed solution.

|  |  |  |
| --- | --- | --- |
| **FR No** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | User Registration | Registration throughForm. |
| FR-2 | User Confirmation | Confirmation viaEmail. |
| FR-3 | Image Uploading | Calculation of Nutrition level. |
| FR-4 | View History | Enable to view the old result. |
| FR-5 | Delete History | Enable to delete the old result. |

**4.2 NON FUNCTIONAL REQUIREMENTS:**

                   Following are the non-functional requirements of the proposed                        solution.

|  |  |  |
| --- | --- | --- |
| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | Usability | Using Android or IOS or windows application. |
| NFR-2 | Security | The userdata is storedsecurely in IBM Cloud. |
| NFR-3 | Reliability | The Quality Of the Service are trusted. |

|  |  |  |
| --- | --- | --- |
| NFR-4 | Performance | It provide smooth user experience. |
| NFR-5 | Availability | The Service are available for 24 /7. |
| NFR-6 | Scalability | It is easy to scalable sizefor users. |

**5. PROJECT DESIGN** :

**5.1 Data Flow Diagrams:**

A Data Flow Diagram is a way of representing a flow of data through a process or a system. A Data Flow Diagram is a traditional visual representation of the information flow within a system.it shows how data enters and leaves the system, what changes the information,and where data is stored.

|  |  |
| --- | --- |
|  |  |
|  |  |

**5.2 Solution & Technical Architecture:**

**5.3 User Stories:**

Use the belowtemplate to list all the user storiesfor the product.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **User Type** | **Functional Requirement (Epic)** | **User StoryNumber** | **User Story / Task** | **Acceptance criteria** | **Priority** | **Release** |
| Customer | Registration | USN-1 | As a user, I can register for the application by entering my name, e-mailand  password. | As a user, I feel the site is verysecure. | High | Sprint-1 |
|  | Registration | USN-2 | As a user, I will receive confirmation email onceI have registered for the  application. | I can receive confirmation email & click confirm. | Medium | Sprint-1 |
|  | Login | USN-3 | As a user, I can login to the application through e mail  and password. | I can access my account  /dashboard. | Medium | Sprint-2 |
|  | Database | USN-4 | As a user, I can upload image of the meal. | I can get the nutritional value of that  particular meal | High | Sprint-3 |
| Administrator | Maintaining details for users | USN-5 | Maintaining detailsfor users. | I can access database. | High | Sprint-4 |
|  | Security | USN-6 | As a user, I feel the site is very secure. | I can access my account withmy login  credentials. | High | Sprint-1 |

**6. PROJECT PLANNING& SCHEDULING**

**6.1 sprint planning & Estimation**

**Sprint Delivery schedule**

Product Backlog,Sprint Schedule, and Estimation

Use the below templateto create productbacklog and sprintschedule

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **sprint** | **Functional Requirement** | **User Story Number** | **User story/Task** | **Story Points** | **Priority** | **Team Members** |
| Sprint 1 | Create flask project | USN-1 | We installed flask and created sample flask  project. | 3 | Medium | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |
| Sprint 1 | Create IBM Cloud account | USN-2 | We sign up for an IBM cloud account. | 7 | High | B.Sneha G.Uma E.Salma R.Sevanthi S.Kiruthiga |
| Sprint 1 | Install IBM cloud CLI and Docker CLI installation | USN-3 | We installed IBM cloud CLI and  installed Docker CLI | 5 | High | B.Sneha R.Sevanthi S.Kiruthiga E.Salma  G.Uma |
| Sprint 1 | Create an account in send grid and account in nutrition  API | USN-4 | We created account in send grid and in nutrition  API | 5 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint 2 | Create UI to interact with application | USN-5 | Create Registration page, login page, Upload image page, prediction image page for food items and view history  of items | 8 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |
| Sprint 2 | Create IBM DB2 and connect with python | USN-6 | Create the IBM DB2  service in IBM cloud and connect the python code with  DB. | 6 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |
| Sprint 2 | Integrate Nutrition API | USN-7 | Integrate the nutrition API to the flask with  API call. | 6 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |
| Sprint 3 | Send grid integration with python code | USN-8 | To send emails from the application we need to integrate the send  grid service. | 20 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |
| Sprint 4 | Containerize the app | USN-9 | We created the Docker image for flask app | 9 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma  E.Salma |
| Sprint 4 | Upload image to IBM container registry | USN-10 | We uploaded the image IBM  container registry | 6 | High | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sprint 4 | Deploy in kubernetes | USN-11 | The uploaded on IBM container registry deployed the image to IBM Kubernetes  Cluster. | 5 | Medium | B.Sneha R.Sevanthi S.Kiruthiga G.Uma E.Salma |

**6.3** **Reports from JIRA**

**Project Tracker, Velocity & Burndown Chart :**

**Burndown Chart:**

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile [software development](https://www.visual-paradigm.com/scrum/what-is-agile-software-development/) methodologies such as [Scrum](https://www.visual-paradigm.com/scrum/scrum-in-3-minutes/). However, burn down charts can be applied to any project containing measurable progress over time.

**7. CODING AND SOLUTIONING:**

**7.1 Feature-1**– **E mail Service**

To the project, we incorporated an email service. This service sends email messageswith nutrition-related information directly to customers' inboxes.

def custom\_send\_mail(email, data):

sg = sendgrid.SendGridAPIClient(SENDGRID\_API\_KEY) from\_email = Email("[nutritioninyourlife.foryoy@gmail.com](mailto:nutritioninyourlife.foryoy@gmail.com)") to\_email= To(email) # Change to your recipient

subject = "Nutrition is a basic human need and a prerequisite for healthy life"

content = Content("text/plain",

f"'{data}'")

mail = Mail(from\_email, to\_email, subject, content)

# Get a JSON-ready representation of the Mail object mail\_json = mail.get() sg.client.mail.send.post(request\_body=mail\_json)

**7.2 Feature – 2 Keeping Records**

We store the nutrition-related information on the database,so users can access the data when they need it.

**Adding result into database,**

insert\_sql = "INSERT INTO PERSON VALUES(?,?,?,?)"

prep\_stmt = ibm\_db.prepare(conn, insert\_sql)

ibm\_db.bind\_param(prep\_stmt, 1, session['name'])

ibm\_db.bind\_param(prep\_stmt, 2, session['email'])

ibm\_db.bind\_param(prep\_stmt, 3, complete\_value)

ibm\_db.bind\_param(prep\_stmt, 4, current\_time) ibm\_db.execute(prep\_stmt)

**Getting information from the database**

def get\_history():

           history = []

  sql = f"SELECT \* FROM PERSONWHERE email =

'{session['email']}'"

               stmt =           ibm\_db.exec\_immediate(conn, sql)

dictionary = ibm\_db.fetch\_both(stmt) while dictionary:

history.append(dictionary)

dictionary = ibm\_db.fetch\_both(stmt) returnhistory

**DATABASE SCHEMA**

**TESTING:**

import unittest

try:

from app import app

except Exception as e:

print('Some modulesmissing {}'.format(e))

class FlaskTest(unittest.TestCase): # check if response is 200

def test\_index(self):

tester = app.test\_client(self) response = tester.get("/") statuscode = response.status\_code self.assertEqual(statuscode, 200)

# check content type

def test\_index\_content(self): tester = app.test\_client(self) response= tester.get("/")

self.assertEqual(response.content\_type, 'text/html; charset=utf-8')

def test\_register(self):

tester = app.test\_client(self) response = tester.post('/register',

data=dict(email='username', password='password'),follow\_redirects=True)

self.assertTrue(b'email' in response.data)

# check log in

def test\_login(self):

tester = app.test\_client(self)

response = tester.post('/', data=dict(email='username',password='password'), follow\_redirects=True)

self.assertTrue(b'email' in response.data)

# checking forgot function def test\_forgot(self):

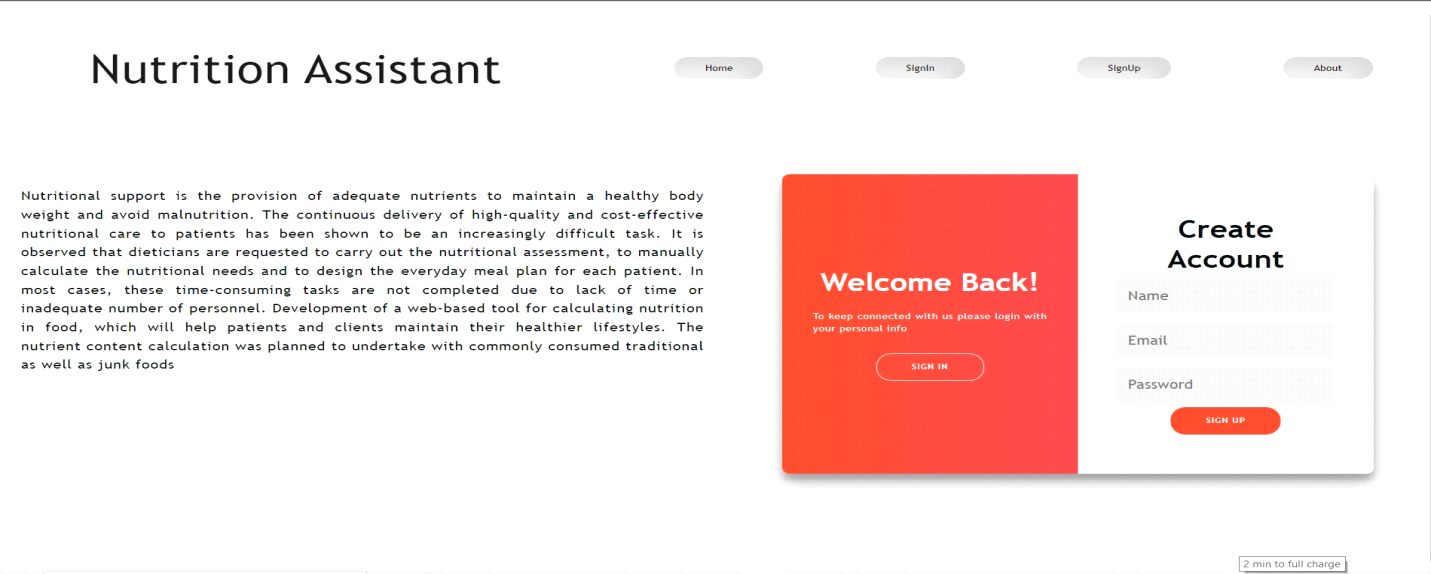
tester = app.test\_client(self)

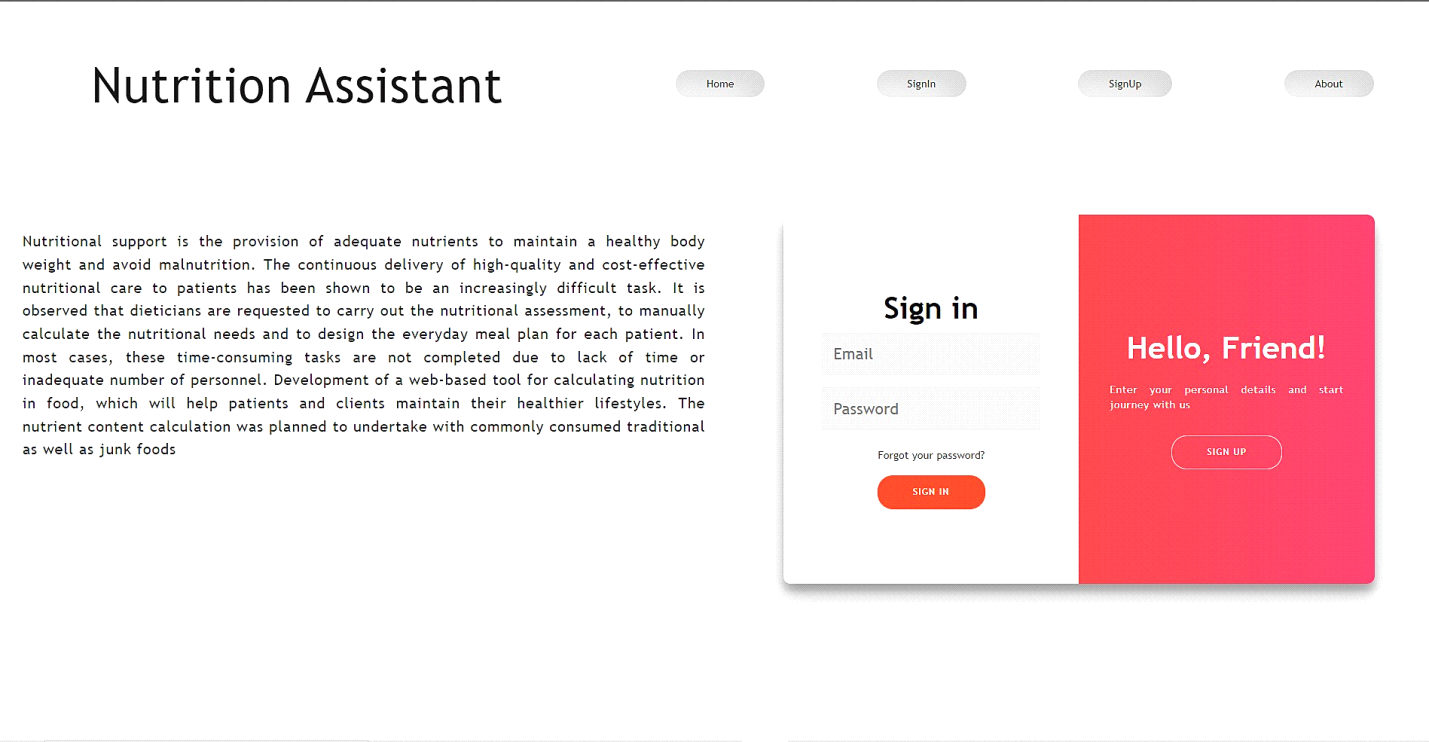
response = tester.post('/', data=dict(email='username'),follow\_redirects=True)

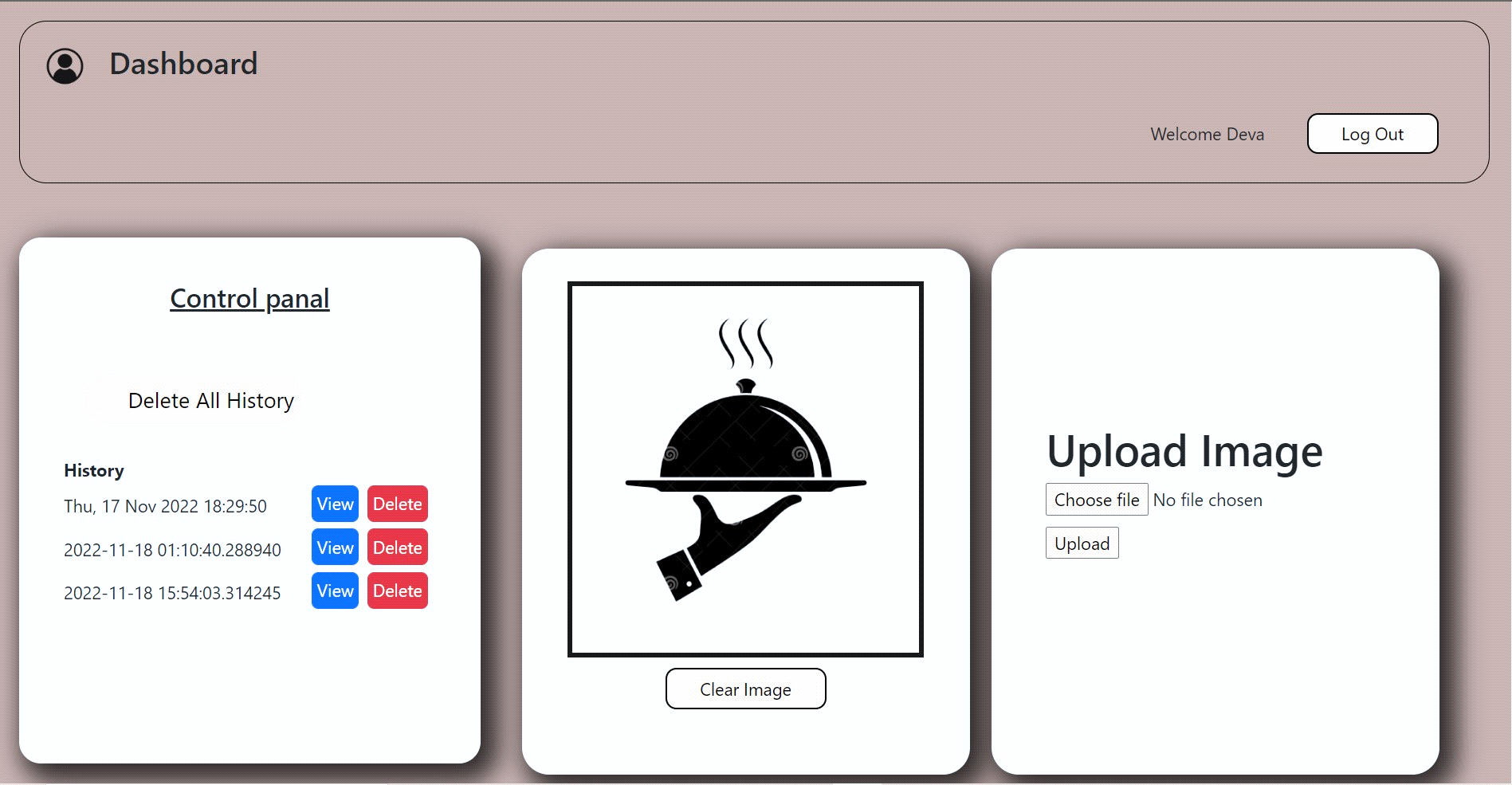
self.assertTrue(b'email' in response.data)

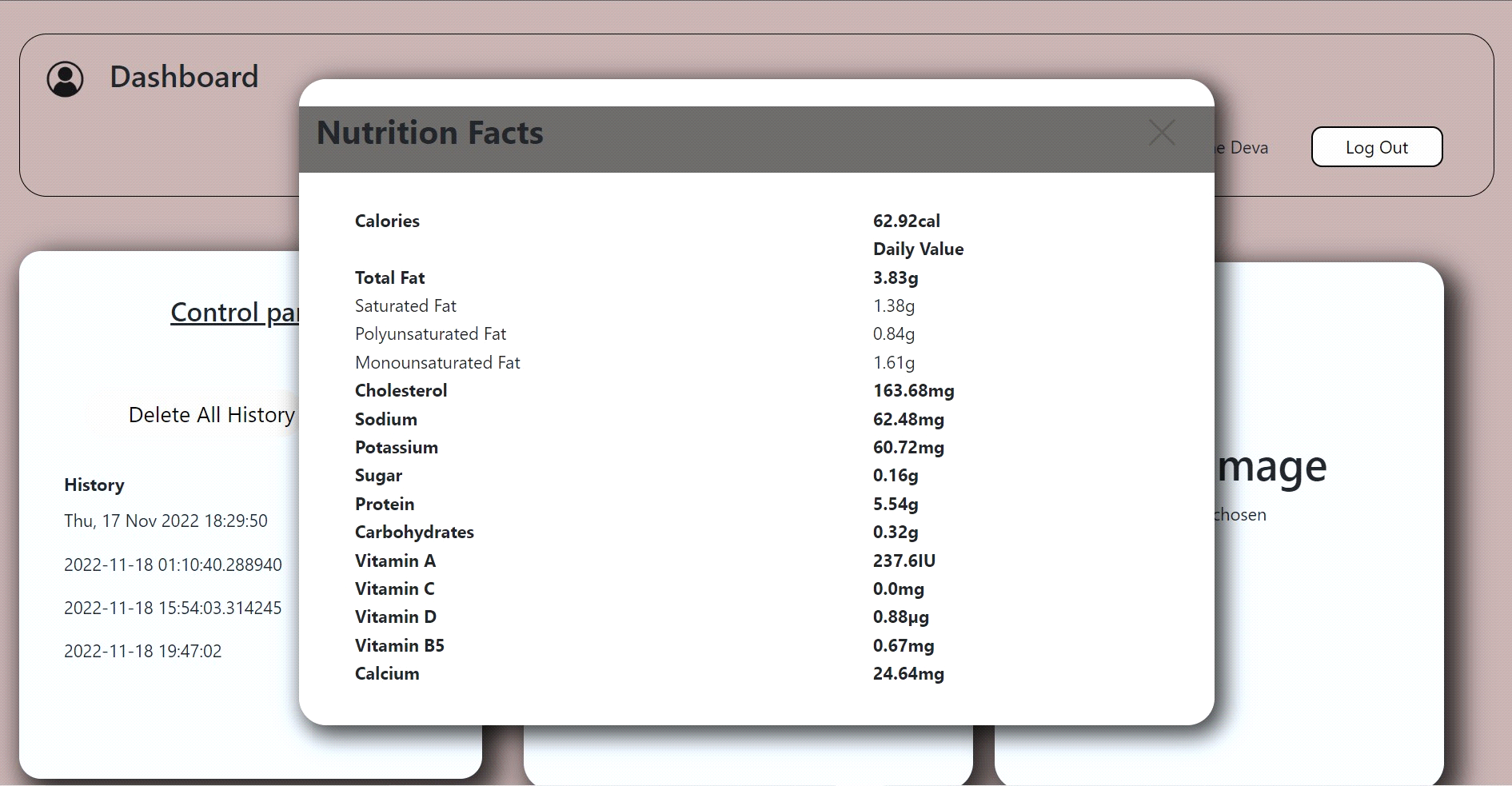
if     name    == '    main    ': unittest.main()

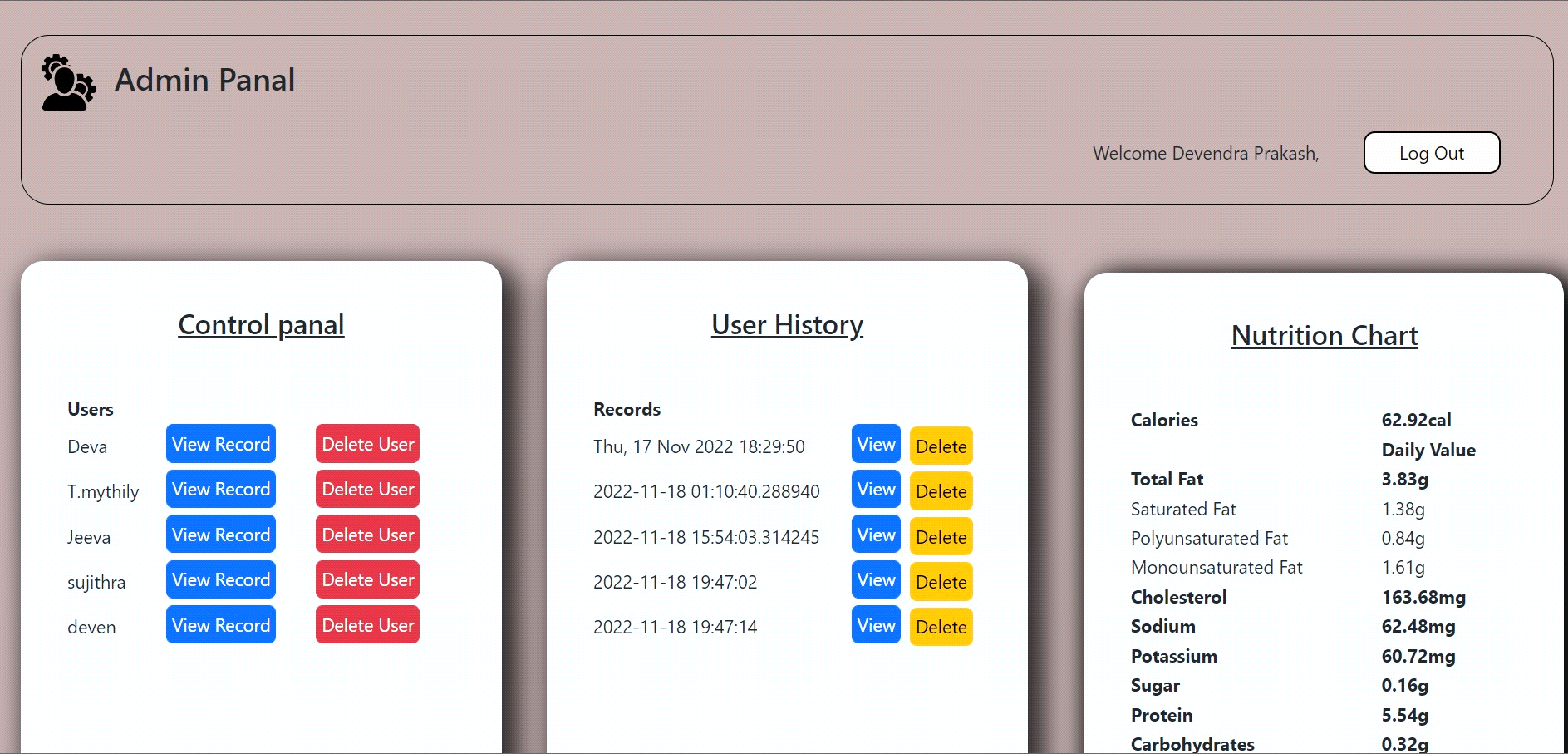
**RESULT:**











* **ADVANTAGES:**
* Low Energy Consumption.
* Works UnderLow Data Connection.
* User FriendlyWeb Application.
* Data Privacy.
* Easy to Understand.

**DISADVANTAGES:**

* ItCannot be Used Without Internet Connection.

* Usage of 3rd party API may causethe time delay.

* **CONCLUSION:**

Nutritional support is the provision of adequate nutrients to maintain a healthy body weight and avoid malnutrition. The continuous delivery of high-quality and cost-effective nutritional care to patients has been shown to be an increasingly difficult task.

It is observed that dieticians are requested to carry out the nutritional assessment, to manually calculatethe nutritional needs and to design the everyday meal plan for each patient. In most cases, these time-consuming tasks are not completed due to lack of time or inadequate number of person.

We developed a cloud based nutrition application which detectsthe nutrition in food. It clarifies the calories in the food which affectsour health.

* **FUTURE SCOPE :**

Associations and effects of foods and nutrients on health. Dietary patterns and health. Molecularnutrition. Health claimson foods.

The scope of a study explains the extent to which the research area will be explored in the work and specifies the parameters within the study will be operating. Basically, this means that you will have to define what the study is going to cover and what it is focusing on.

Project scope is a way to set boundaries on your project and define exactly what goals, deadlines, and project deliverables you'll be working towards. By clarifying your project scope, you can ensure you hit your project goals and objectives without delay or overwork.Defining your projectscope isn't a one-person job.

Future Scope is for the Undergraduates, Graduatesand the Working Professionals. They may want to review or reconsider their future optionsand goals in terms of its suitability now; may be with a different perspective of their options in terms of time, resources, inclination etc.

You can work as a Nutritionist/Dietitian there and take control of the food intake and also the food quality consumed by the people. With a degree in food and nutrition, you can act as a Public Health Nutritionist in non governmental organizations and play

your part in spreading some good in the world.

The scope of this field is as follows: Graduates can work as a project assistant, project associate at an organization like PHFI, WHO, UNICEF, health organizations. Work as a chief nutritionist in NGO or private organizations.

**APPENDIX:**

**SOURCE CODE**

**SOURCE CODE- GITHUB LINK**:

[**https://github.com/IBM-EPBL/IBM-Project-52441-1661004135**](https://github.com/IBM-EPBL/IBM-Project-52441-1661004135)

**DEMO VIDEO LINK:**[**https://youtu.be/P8RiNqI6tm4**](https://youtu.be/P8RiNqI6tm4)