Team ID	PNT2022TMID26133
Project Name	NUTRITION ASSISTANT APPLICATION

1.INTRODUCTION

1.1 Overview

Evaluation of nutritional status is critical, either to identify if an individual has nutritional imbalance due to an underlying condition or to assess if an individual is likely to develop a pathological condition due to nutritional imbalance. A detailed, systematic evaluation of a patient's nutritional status conducted by healthcare providers in a team-based setting to diagnose malnutrition and identify underlying pathologies to plan intervention constitutes nutritional assessment. Wellness and healthy lifestyles have become the mainstream. Interest in fitness applications and revenue from them grow as fast as the number of people striving to be fit.

People need to control their daily nutritional intake by eating healthier foods which is the most basic method to avoid these risks. However, although food packaging comes with nutrition labels, it’s still not very convenient for people to refer packaged food due to the use of various preservatives which are not good for health.

Therefore, we developed a web-based nutrient dashboard system which can analyse real-time images of a meal for nutritional content which can be very handy and improves the dietary habits, and thus helps in maintaining a healthy lifestyle.

1.2 Purpose

Our purpose is that every food vendor and clients will be aware of the meal's quality and the nutrients that are present in the food in an instant.
Previously before starting a good diet clients had to study about the nutritional components of each of the food material and calculate the overall nutritional supplements present in an individual food before consuming it. That is too much time consuming and false knowledge in this matter can lead to having unbalanced diet which can be rather cost effective. But with this application clients can easily get to now about the nutritional components that is present in the food just by using our web application and by clicking a capture of image of the food or upload the food's picture from the gallery in the module and the module will give you the nutrients that is present in that food as output.

2. LITERATURE SURVEY

2.1 Existing problem

Nutrient deficiencies are prevalent worldwide. Diseases and morbid Conditions have been described to result from nutritional deficiencies. It is essential to address nutrient deficiencies as these may lead to chronic long-term health problems such as rickets, iron deficiency anaemia, Goitre, obesity, coronary heart disease, type 2 diabetes ,stroke, cancer and osteoporosis. In the present review we surveyed the extent and severity of nutritional deficiencies in Israel through a selective and comprehensive Medline review of previous reports and studies performed during the last 40 years. Israeli populations have multiple nutritional deficiencies, including iron, calcium, zinc, folic acid, and vitamins B12, C, D and E, spanning all age groups, several minorities, and specific regions. In Israel, some of the nutrients are mandatorily implemented and many of them are implemented voluntarily by local industries. We suggest ways to prevent and treat the nutritional deficiencies, as a step to promote food fortification in Israel.

2.2 References

Enhancing Cloud and healthy Food Nutrition Information Systems Practice- Paul, PK and Aithal,PS and Bhuimali, A

Mobile cloud basedsystem recognizingnutrition and freshness of food image- Kumbhar, Dipteeand Patil, Sarita

Predicting calorific value for mixed foodusing image processing- Kohila, R and Meenakumari, R

Use of artificial intelligence in precision nutritionand fitness- de Moraes Lopes, Maria Helena Baena and Ferreira, DantonDiego and Ferreira, Ana Claudia Barbosa Honorio and da Silva, Giuliano Roberto and Caetano, Aletha Silva and Braz

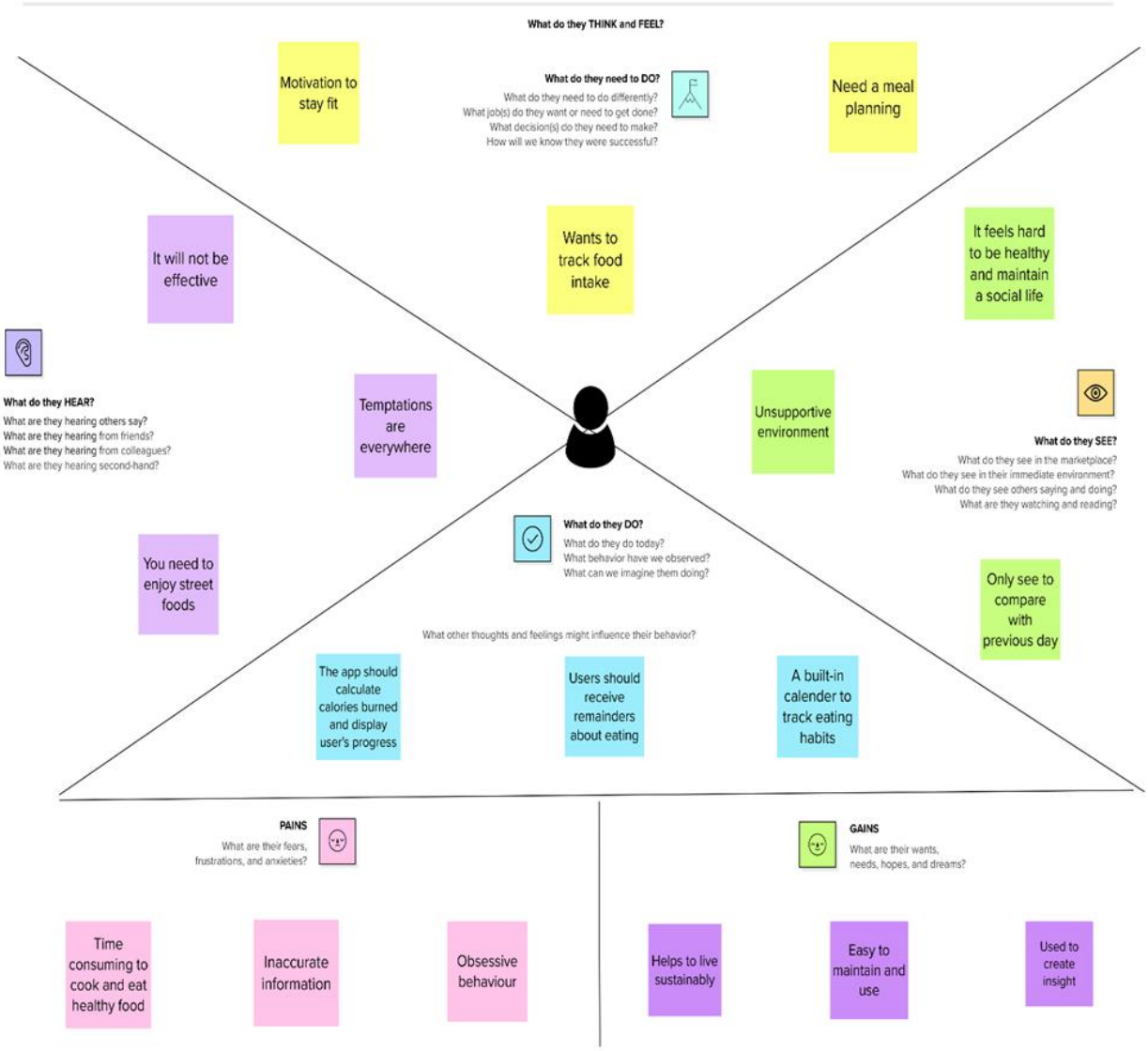
2.3 Problem Statement Definition

A variety of medical problems can affect your appetite. Your illness, medicines or surgery can cause these problems. Many people become frustrated when they know they need to eat to get well but they aren't hungry,or when they gain weight because they are fatigued and unable to exercise.Each of the following sections describes a nutritional problem and suggests possible solutions. Not all solutions will work for everyone.

Problem Statement (PS)	I am (Customer)	I m trying to	But	Because	Which makes me feel
PS-1	Fitness freak	Finding a pefectpre workout plan for maintaining fitness	I can't choose a correct plan	It is Confusing	A perfect daily pre workout plan suggestion
PS-2	student	Find a blanced nutrition diet to lossweight	There is no balnced diet avaliable without workout	I have no timetodo workout	A best nutritional baseddiet plan with less workout
Ps-3	Body Builder	Choose a best plan forwhole body workout	It is hard toselect a best workout plan	A wrong workout planwill lead to achange in theshape of my body	Perfect diet and workoutplan for bodybuilding
Ps-4	Athlete	Choose a best nutrition paln and workoutworkout technique to increase my sprinting speed	Confused with many techniques	I want to increse my sprinting speedvery much before than ever	Perfect suggestions
Ps-5	pregnant woman	Choose a yoga and healthynutrition diet forthe normal pregnancy delivery	I am not familiar with yoga and diet	I dont have idea aboutthe yoga and exercise	User friendly applicationto choose the beginner based type ofyoga ,exercises and nutritionbase diet plan

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

TIP

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

Person 1

Technical Assistant	Real time tweak to current model	Reporting of data
Makes an observation about life	Shopping list	Changes tracker
Payment	Helps to lead healthy life style	Effective

Person 2

Diet based on user's specific needs	Decision making process	Notifications on eating habits
Offers guidance	A built-in calender	Diet goal setting
Helps to become aware	Records management	Messenger

Person 3

Recommends recipe	Barcode scanner	Statistics charts
Provide data for evaluation	Help and support	Direct impact to different set of users
Quick way to see food quality	Motivation to stay fit	Display user's progress

Person 4

Plan their meals	Diet tracker	Comfortable to use
Alerts on user's routine	Accuracy	Food logging
Helps to avoid malnutrition	Clarity on how to eat healthy	Efficient to use

3

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 bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Features of the Application

- Diet chart planner
- Shopping list organizer
- Calorie tracking
- Alerts and notifications
- Payment and support

Functionalities and data processing

- Smart nutrition database
- Food scan process
- Process the food and shownthe outcomes
- Validate the food with user requirements
- User can check the daily diet plan

Result evaluation and declaration

- Has handy set feature
- It is user friendly
- Has smart monetization models
- Better Accuracy
- Keeps track of everyday data

4

Prioritize

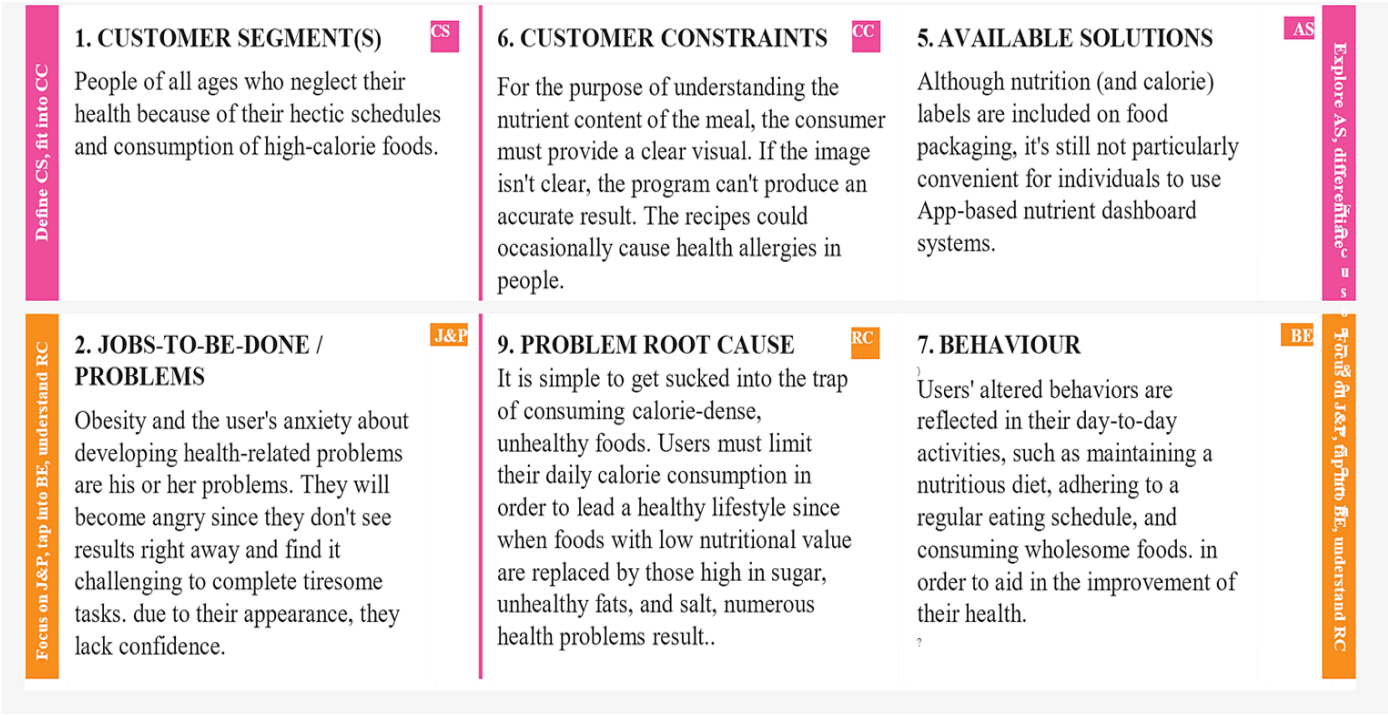
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

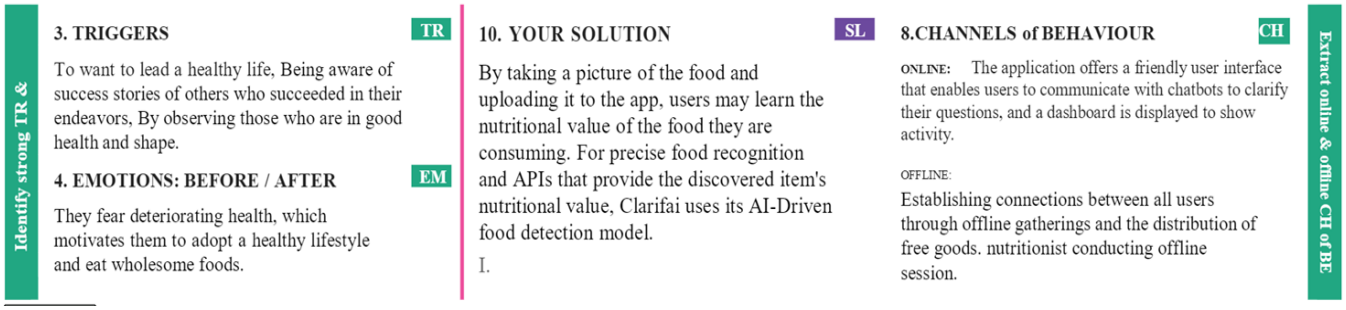
20 minutes

3.3 Proposed Solution

Now a days peoples are not eating healthy foods with respect to their health condition. If it happens continuously means, it will lead to obesity and any other health problems .To avoid that the system will detect andrecognize the food and evaluating the nutrient values present in the food. To store the food and details of the nutrientspresent in it. Then scan the real time food and retrieve the
corresponding food's nutrient values. Clustering the peoples based on their BMI value. The application which gives awareness amongthe people about the obesity and various health problems. In market, this application gives a benefit
across the people by health wise andeconomical wise. The application which creates an impactamongst he healthy lifestyle.

3.4 Problem Solution fit





4.REQUIREMENT ANALYSIS

Hardware Requirements

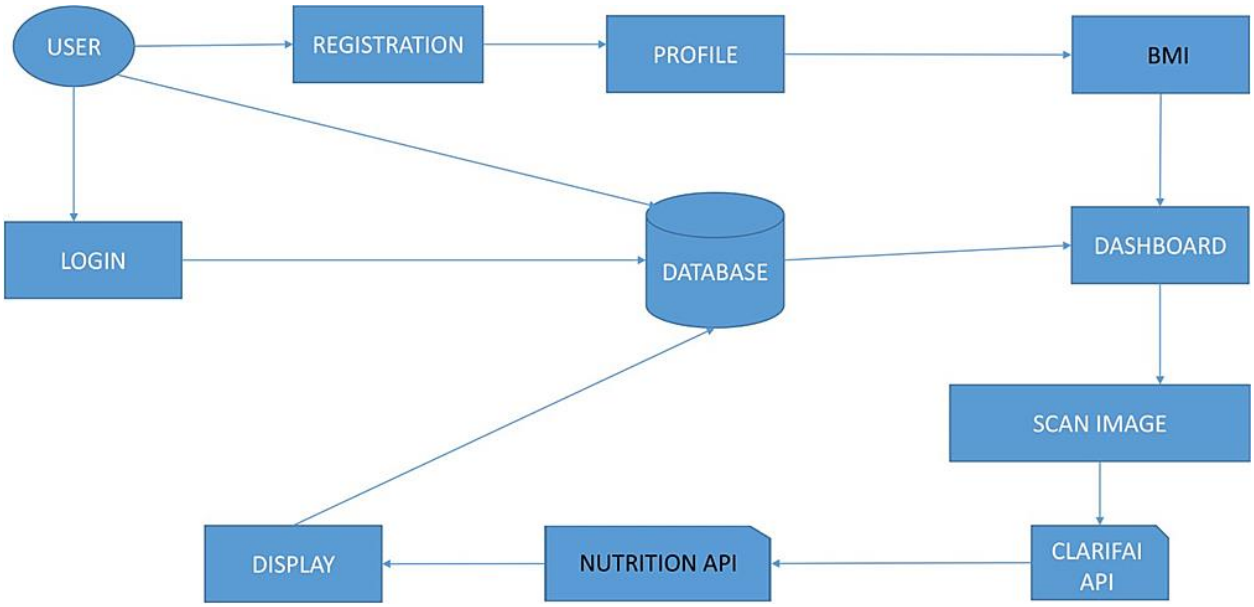
1. No Hardware is required for this project.

Software Requirements

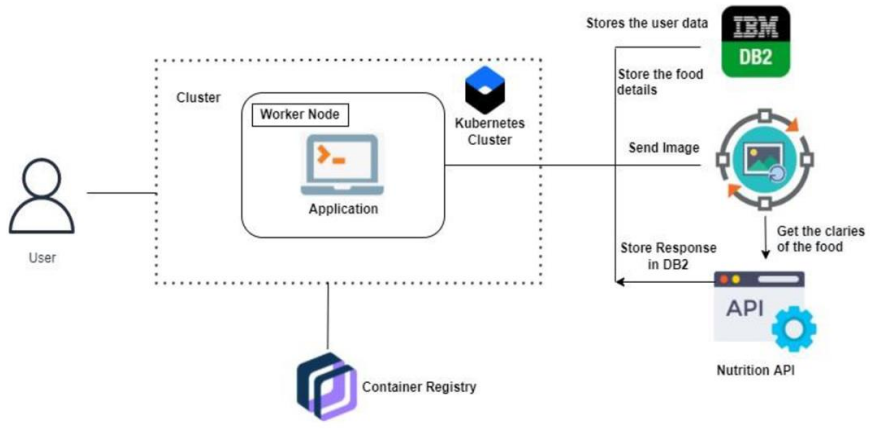
1. There is only one web application needed.
2. For application deployment, we use Red Hat OpenShift and docker-file.
3. We use Virtual Studio code for writing the code.

5. PROJECT DESIGN

5.1 Data Flow Diagrams



5.2 Solution & Technical Architecture



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Webuser)	Registration	USN-1	As a user, I can register for the application by entering my email, and password.	I can access my account /dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmationemail& click confirm	High	Sprint-1
	Profile	USN-3	As a user, I can enter my Height, weight, age, gender and Activity level.	I can update my profile	High	Sprint-1
	Login	USN-4	As a user, I can log into the application byentering email & password	I can access my dashboard	High	Sprint-1
	Dashboard	USN-5	As a user, I can track my progress	I can access my dashboard	High	Sprint-2
		USN-6	As a user, I can upload food image	I can get nutritional valuesof that food	High	Sprint 2
Customer Care Executive	Customer care	USN-7	Providing support for users	Users can get 24/7support	medium	Sprint 3
Administrator	Maintain application	USN-8	Maintaining details for uses	I can access database	High	Sprint 4

6.PROJECT PLANNING & SCHEDULING

6.1 Sprint Delivery Plan

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Setting Up Application Environment	USN-1	To create lots of environment. Create or Enrolment to the IBM cloud, Docker CLI installation, create an account in SendGrid and Nutrition API, etc.,	20	High	Abirami C.A Devi Priya.K Dharani.S Prakalya R.S
Sprint-2	Implementing Web Application	USN-2	We create a UI to interact with application. Create database system DB2 and connect it with python and integrate with Nutrition API.	20	High	Abirami C.A Devi Priya.K Dharani.S Prakalya R.S

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Integrating SendGrid Service	USN-3	SendGrid integration with python code for include some RestAPI services for to give a Nutrition and calorie value.	20	High	Abirami C.A Devi Priya.K Dharani.S Prakalya R.S
Sprint-4	Deployment of App in IBM Cloud	USN-4	In the deploy process, the deployment in Kubernetes cluster is the major task before that we need to containerize the app and upload image to IBM container Registry	20	High	Abirami C.A Devi Priya.K Dharani.S Prakalya R.S

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

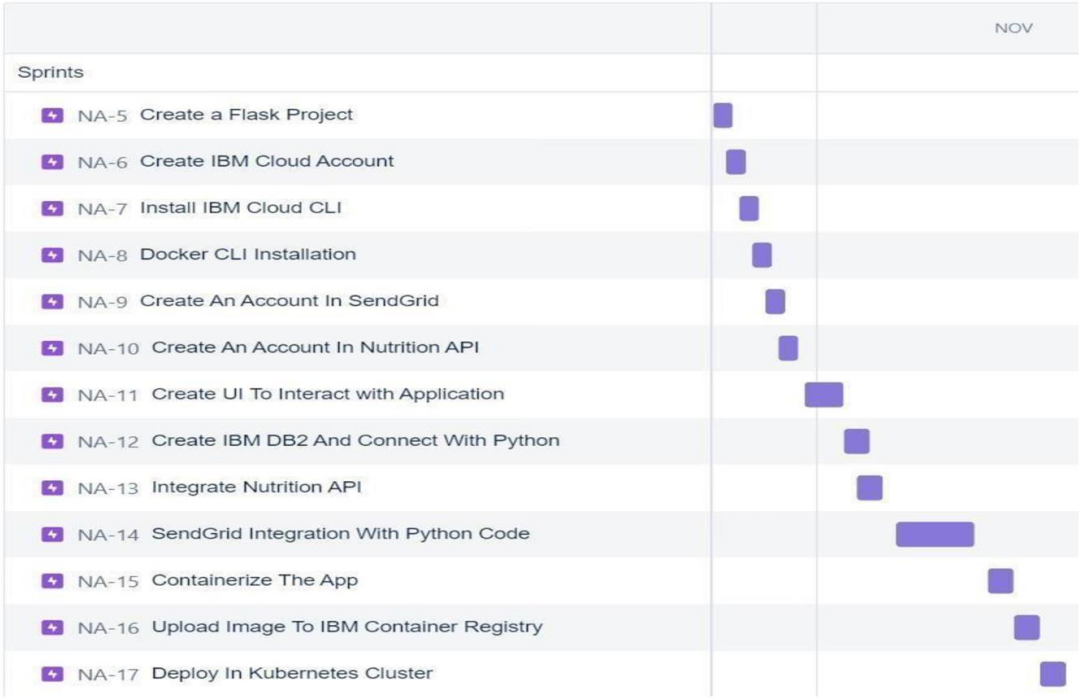
Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

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 methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



7. CODING & SOLUTIONING

Source Code

Register.html

```
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<style>
*{
padding:0;
margin:0;
font-family: sans-serif;
}
body{
background: url(C:\Users\THENMOZHI\Downloads\shutterstock_1015800871-1.jpg)no-repeat;
```

```
background-size: cover;
}
.registration-form{
position:absolute;
top:50%;
left: 50%;
transform: translate(-50%, -50%);
width:400px;
}
.registration-form h1{
font-size: 30px;
text-align: center;
text-transform: uppercase;
margin: 0 4px;
display:flex;
justify-content: center;
cursor: pointer;
border-radius: 20px;
color:blue;
text-shadow:0 0 15px blue,0 0 25px yellow;
animation: animate 1.5s linear infinite;
}
.registration-form p{
font-size: 20px;

margin: 15px 0;
}
.registration-form input{
font-size: 16px;
padding: 15px 10px;
width: 100%;
border: 0;
border-radius: 5px;
outline: none;
background: rgba( 255, 255, 255, 0.25 );
box-shadow: 0 8px 32px 0 rgba( 31, 38, 135, 0.37 );
backdrop-filter: blur( 4px );
-webkit-backdrop-filter: blur( 4px );
border-radius: 10px;
```

```
border: 1px solid rgba( 255, 255, 255, 0.18 );
}
.registration-form button{
font-size: 18px;
font-weight: bold;
margin: 20px 0;
padding: 10px 15px;
width: 50%;
border: 0;
border-radius: 5px;
background-color: #fff;
background: rgba( 255, 255, 255, 0.25 );
box-shadow: 0 8px 32px 0 rgba( 31, 38, 135, 0.37 );
backdrop-filter: blur( 4px );
-webkit-backdrop-filter: blur( 4px );
border-radius: 10px;
border: 1px solid rgba( 255, 255, 255, 0.18 );
}
.registration-form button:hover{
color: blue;
}
.alreadylogin{
text-align: center;
font-size: 18px;
}
.alreadylogin h3{

text-align: center;
font-size: 15px;
}
.alreadylogin a{
font-size: 15px;
}
.alreadylogin a:hover{
color: blue;
}
<title>
Login page
</title>
```

```
</style>
</head>
<body>
<div class="registration-form">
<h1>
Login
</h1>
<form action="#" method="post">
<p>
Email:
</p>
<input type="email" name="email" placeholder="Email">
<p>
Password:
</p>
<input type="password" name="password" placeholder="Password">
<br>
<button type="submit">
Login
</button>
</form>
<br>
<div class="alreadylogin">
<h3>if you don't register please click here </h3><a
href="register.html">REGISTER HERE</a>
</div>
</div>

</div>
<div class="square"></div>
</body>
</html>
Index.html
<html>
<head>
<meta name="viewport"content="with=device-width, initial-scale=1.0">
<title>
Nutrition Assistant Application
</title>
```

```
<link rel="stylesheet" href="thenmozhi.css">
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
<link
href="https://fonts.googleapis.com/css2?family=Poppins:ital,wght@0,100;0,200;0,
300;0,400;0,500;1,100&display=swap" rel="stylesheet">
<link rel="stylesheet"

href="https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
free@6.2.0/css/fontawesome.min.css">

</head>
<body>
<section class="header">
<div class="title">
<h1>NUTRITION ASSISTANT</h1>
</div>
<nav>
<div class="nav-links">
<ul>
<li>
<a href="register.html">REGISTER</a>
</li>
<li>
<a href="login.html">LOGIN</a>

</li>
<li>
<a href="upload image.html">UPLOAD IMAGE</a>
</li>
<li>
<a href="#">HISTORY</a>
</li>
</ul>
</div>
</nav>
<nav>
<div class="container">
<video src="C:\Users\THENMOZHI\Documents\videoes.mp4" autoplay muted
```

loop></video>
</nav>

<h1>
Nutrition app
</h1>

A Nutrition Assistant is a specialist that uses diagnostic procedures to identify nutrition deficiencies in patients.

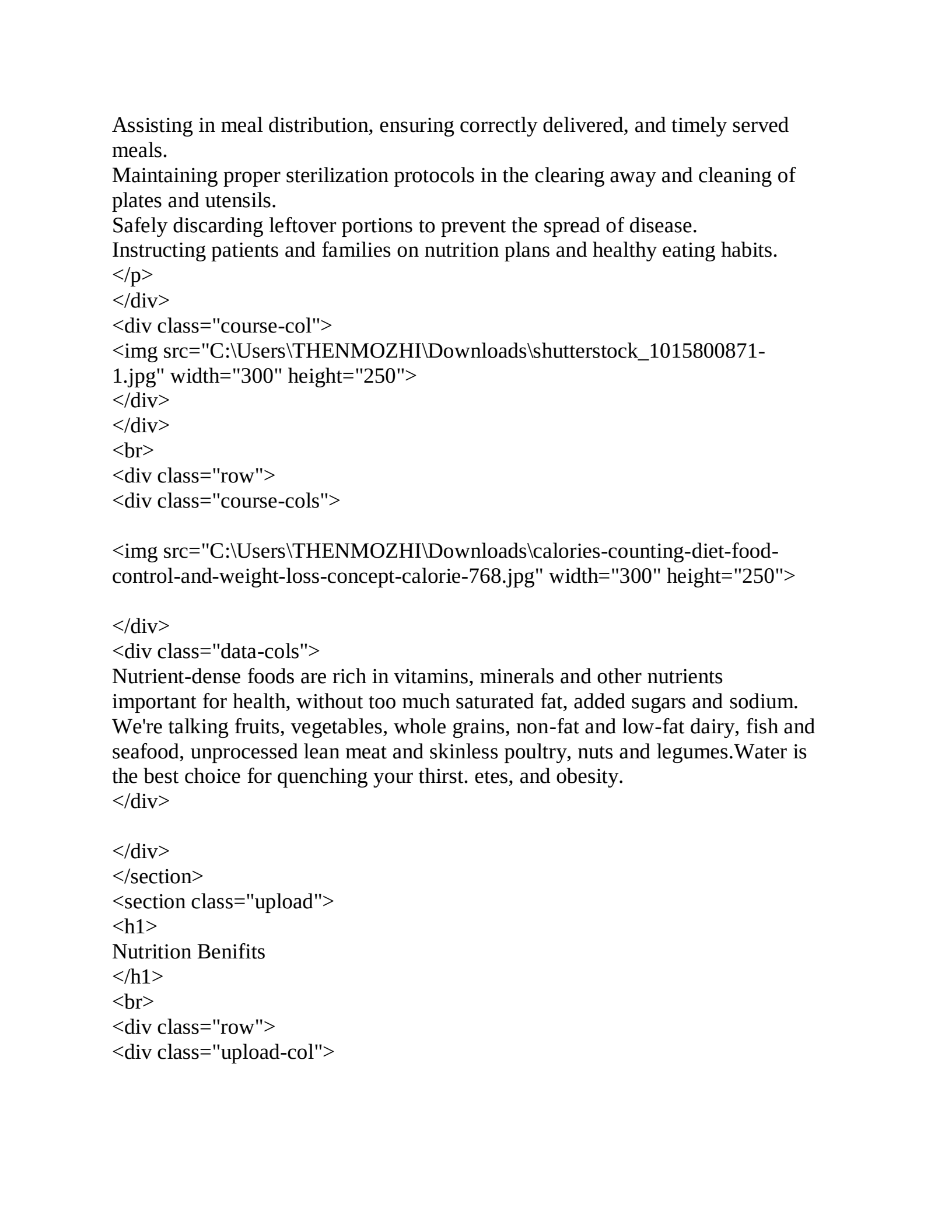
 They work closely with nutritionists and dietitians to improve the well-being of patients through proper nutrition.

 Nutritionists need to determine their patients' needs through interviewing them and giving them the best meal plans after assessing all risk factors.

</section>
<!-------data-->
<section class="data">
<h1>
Nutrition Food
</h1>

Providing dieticians with the facility's meal and menu planning.
Obtaining dietary information and assessing the nutritional habits of patients.
Recording individual risk factors or dietary restrictions that might impact meal planning.
Coordinating meal plans with nutritionists and healthcare professionals.
Performing ongoing nutrition assessments, including the measurement of caloric intake and activity levels.
Facilitating immediate interventions for signs of malnutrition, allergic reactions, or refusal to eat.

Assisting in meal distribution, ensuring correctly delivered, and timely served meals.
Maintaining proper sterilization protocols in the clearing away and cleaning of plates and utensils.
Safely discarding leftover portions to prevent the spread of disease.
Instructing patients and families on nutrition plans and healthy eating habits.
</p>



Nutrient-dense foods are rich in vitamins, minerals and other nutrients important for health, without too much saturated fat, added sugars and sodium. We're talking fruits, vegetables, whole grains, non-fat and low-fat dairy, fish and seafood, unprocessed lean meat and skinless poultry, nuts and legumes.Water is the best choice for quenching your thirst. etes, and obesity.

</section>
<section class="upload">
<h1>
Nutrition Benifits
</h1>

<img src="C:\Users\THENMOZHI\Downloads\is-the-dash-diet-right-for-you-722x406.jpg">

<h3>Nutrition
Nutrient-dense foods are rich in vitamins, minerals and other nutrients important for health, without too much saturated fat, added sugars and sodium. We're talking fruits, vegetables, whole grains, non-fat and low-fat dairy, fish and seafood, unprocessed lean meat and skinless poultry, nuts and legumes.Water is the best choice for quenching your thirst. Etc s, and obesity.
</h3>

</section>

</section>
</body>

Python Code

```
from flask import Flask, render_template, request, redirect, url_for, session
import ibm_db
import re
app = Flask(__name__)
app.secret_key = 'a'

conn = ibm_db.connect("DATABASE=bludb;HOSTNAME=125f9f61-9715-46f9-9399-c8177b21803b.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud;PORT=30426;SECURITY=SSL;SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=prr33336;PWD=HjUQ32viK8LI98UT
","","")
@app.route('/')
def homer():
return render_template('home.html')

@app.route('/login',methods =['GET', 'POST'])
def login():
global userid
msg = ''
```

```
if request.method == 'POST' :
username = request.form['username']
password = request.form['password']
sql = "SELECT * FROM users WHERE username =? AND password=?"
stmt = ibm_db.prepare(conn, sql)
ibm_db.bind_param(stmt,1,username)
ibm_db.bind_param(stmt,2,password)
ibm_db.execute(stmt)
account = ibm_db.fetch_assoc(stmt)
print (account)
if account:
session['loggedin'] = True
session['id'] = account['USERNAME']
userid= account['USERNAME']
session['username'] = account['USERNAME']
msg = 'Logged in successfully !'
msg = 'Logged in successfully !'
return render_template('dashboard.html', msg = msg)
else:
msg = 'Incorrect username / password !'
return render_template('login.html', msg = msg)

@app.route('/register', methods =['GET', 'POST'])
def registet():
msg = ''
if request.method == 'POST' :
username = request.form['username']
email = request.form['email']
password = request.form['password']
sql = "SELECT * FROM users WHERE username =?"
stmt = ibm_db.prepare(conn, sql)
ibm_db.bind_param(stmt,1,username)
ibm_db.execute(stmt)
account = ibm_db.fetch_assoc(stmt)
print(account)
if account:
msg = 'Account already exists !'
elif not re.match(r'[^@]+@[^@]+\.[^@]+', email):
```

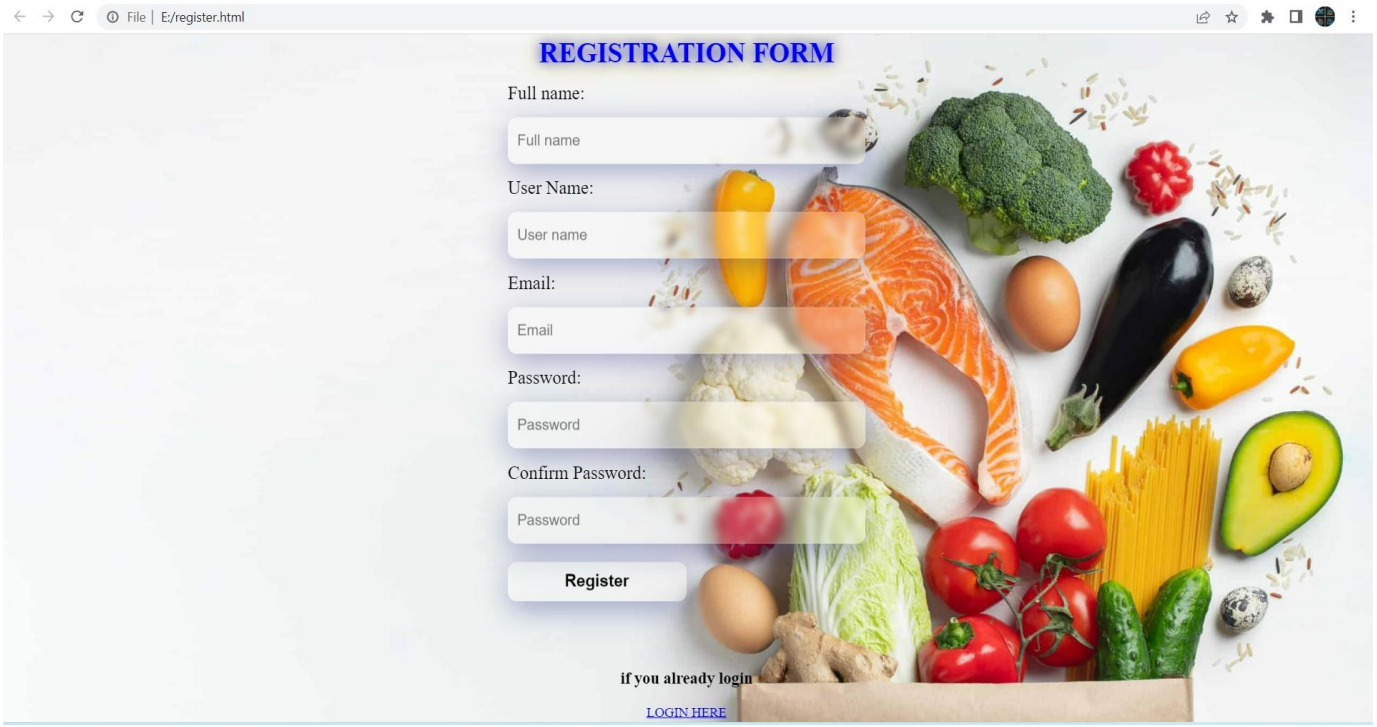
```
msg = 'Invalid email address !'
elif not re.match(r'[A-Za-z0-9]+', username):
msg = 'name must contain only characters and numbers !'
else:
insert_sql = "INSERT INTO users VALUES (?, ?, ?)"
prep_stmt = ibm_db.prepare(conn, insert_sql)
ibm_db.bind_param(prep_stmt, 1, username)
ibm_db.bind_param(prep_stmt, 2, email)
ibm_db.bind_param(prep_stmt, 3, password)
ibm_db.execute(prep_stmt)
msg = 'You have successfully registered !'
elif request.method == 'POST':
msg = 'Please fill out the form !'
return render_template('register.html', msg = msg)

@app.route('/logout')
def logout():
session.pop('loggedin', None)
session.pop('id', None)
session.pop('username', None)

return render_template('home.html')
if __name__ == '__main__':
app.run(host='0.0.0.0')
```

8.Results

8.1 Register Page



8.2 Login Page

8.3 Upload Image

8.4 output

9.ADVANTAGES & DISADVANTAGES

Advantages:-

1. This device is user friendly.
2. Its only required the image of the food .
3. To know the different type of nutrients present in food .
4. And also know that how much composition of the nutrients are present.
5. Output of the screen is easy understandable.

Disadvantage:-

1. This device is not able to predict the multiple image as input.
2. The internet is only necessary for opening the web application.(After Converting the mobile app internet is not necessary for opening .)

10.CONCLUSION

In conclusion, many people have become aware of their health. Moreover, they are also informed how to live a healthy lifestyle. Many studies discuss dietary self-monitoring, and the research on this topic increased in 2017 and started to include mobile applications. Based on the analysis that was carried out using VOSviewer and NVivo, the results of clusters and trending topics from the study were obtained. The researchers chose two cluster themes related to this research: attitudes to improved dietary behavior and mobile health applications. Diet and nutrition applications will remain popular for many years, because the majority of population becomes highly interested in having a good health condition. Many people live in polluted environment and consume products that contain different pesticides, chemicals, genetically modified foods, etc. and desperately try to reduce damage to their health, which implies good conditions for business.

11.FUTURE SCOPE

Mobile apps offer additional opportunities for individual engagement and support as they 'take advantage of computer capabilities as well as the power of networking' . Dietitians and nutritionists are incorporating mobile apps into their practice to a greater extent . While more research is needed on their effectiveness in changing food behaviours, current evidence suggests there may be potential for a positive impact. A wide range of dietary mobile applications is readily available and accessible to the public . Such apps are mainly used as food and exercise tracking tools and their usage, in this context, is effective . Accordingly, there is potential for digital interventions because they may reach many persons at a low cost.

12.APPENDIX

Github link: https://github.com/IBM-EPBL/IBM-Project-5406-1658761778

Project Demo Link: https://github.com/IBM-EPBL/IBM-Project-5406-1658761778/pre-development/project development/sprint4/project demo video.mp4

ssss