

IBM NALAIYA THIRAN PROJECT

AI-POWERED NUTRITION ANALYSER FOR FITNESS ENTHUSIASTS

TEAM ID:PNT2022TMID42147

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AI-Powered Nutrition Analyser For Fitness Enthusiasts

1. INTRODUCTION

1. Project Overview :

Food is essential for human life and has been the concern of many healthcare conventions. Nowadays new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition patterns and maintaining a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and contamination of food.

The main aim of the project is to build a model which is used for classifying the fruit depending on the different characteristics like color, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent to the trained model. The model analyzes the image and detects the nutrition based on the fruits like (Sugar, Fibre, Protein, Calories, etc.).

2. Purpose :

- Know fundamental concepts and techniques of Convolutional Neural Network.
- Gain a broad understanding of image data.
- Knowhow to pre-process/clean the data using different data pre-processing techniques.
- Know how to build a web application using the Flask framework.

2.LITERATURE SURVEY

2.1 Existing problem

Till date there are some tools that analyses the nutrition of the food items. But that was not Precise or AI tool does not work perfectly.

2.2 References

1.Personal Nutrition:

Author: Marie A. Boyle

Become a smarter consumer with Boyle's personal nutrition, 10th Edition. Packed with the latest research, recommendations and emerging trends, this text equips you with a solid foundation in fundamental nutritional principles and the expertise to make informed, healthy choices. Lively illustrations, photographs and examples bring chapter concepts to life, while features like "The Savvy Diner" and "Eat Well, Be Well" offer practical tips you can put into immediate practice.

2. Nutrition for Health and Healthcare :

Author: Linda Kelly DeBruyne,Kathryn Pinna.

Nutrition for health and health care approaches the study of nutrition and diet therapy from the perspective of nursing and health science, including examples and data that can help prepare you for your future career. Learn about basic nutrition concepts, such as metabolism, vitamins, and minerals, and clinical topics organized by organ systems, linking nutrition to different disease states, such as diabetes, renal disease, and liver disorders. Apply what you have learned in Case Studies and Clinical Applications features throughout the text. Use all of the student resources to help you succeed in your course.

3.Nutrition Guide for Clinicians-Third Edition:

Physicians Committee for Responsible Medicine, Neal Barnard, MD. This new edition draws on the latest research to explain nutrition's role in the prevention and treatment of 87 different diseases and conditions. In addition, the guide contains in-depth information on general nutrition, including the roles of macronutrients and micronutrients and specific nutritional requirements for all stages of life. Compiled by a core team of physicians, registered dietitians, and medical editors, this invaluable tool for health professionals was reviewed by an additional group of 20 medical experts from a number of diverse fields, such as gastroenterology, dermatology, oncology, and nutrition

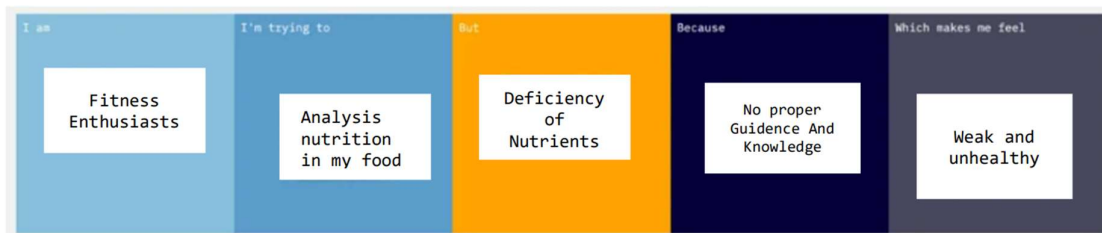
4.Precision nutrition:

Information Technology Group, Wageningen University and Research, Wageningen, the Netherlands.Department of Computer Science and Engineering, Qatar University, Doha, QatarReceived 17 January 2021, Revised 4 March 2021, Accepted 28 March 2021, Available online 7 April 2021, Version of Record 19 April 2021.

2.3 Problem Statement Definition

Food is essential for human life and has been the concern of many healthcare conventions. Nowadays new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and contamination of food.

The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent the trained model. The model analyses the image and detect the nutrition based on the fruits like (Sugar, Fibre, Protein, Calories, etc.).

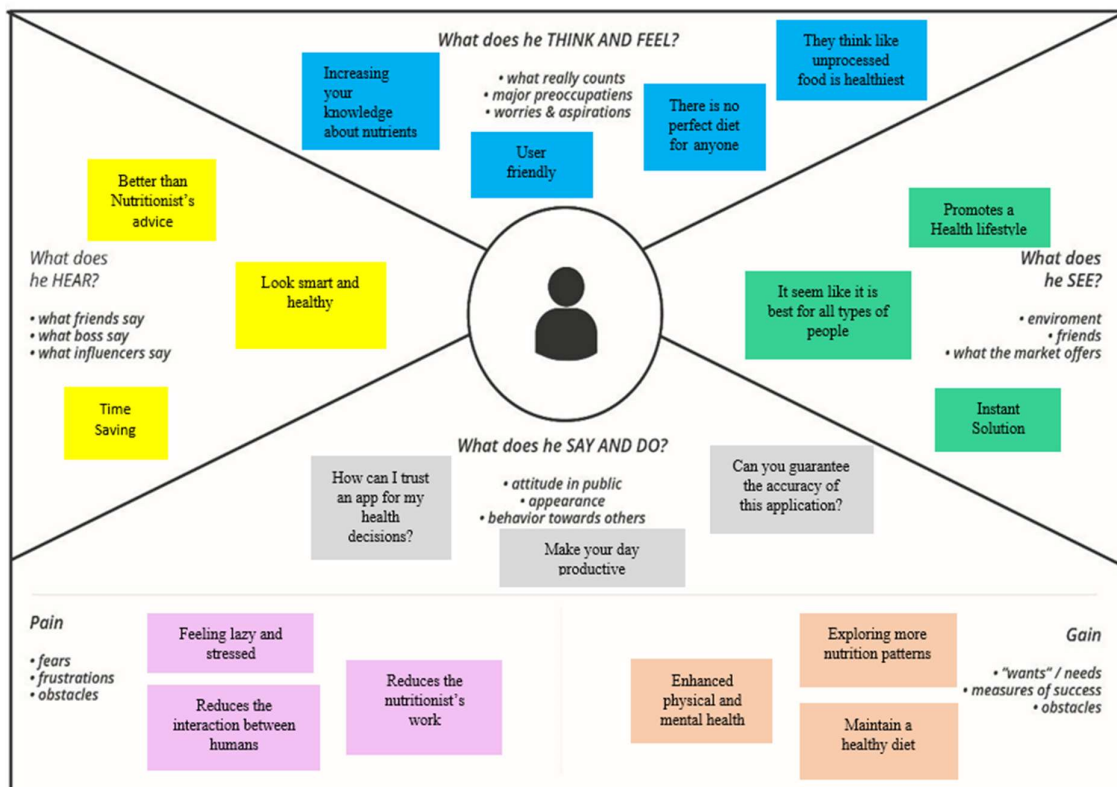


Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Fitness Enthusiasts	Analysis nutrition in my food	Deficiency of Nutrients	No proper Guidance And Knowledge	Weak and unhealthy
PS-2	Fit people	Maintain Physique	Take uneven calorie food	Unaware of Foods nutrition facts	Useless

3.IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes. It is a useful tool to help teams better understand their users. Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.




3.2 Ideation & Brainstorming

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions. Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template



Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

⌚ 10 minutes to prepare
👥 1 hour to collaborate
👤 2-8 people recommended

[Share template feedback](#)

➔

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

A

Team gathering

Define who should participate in this session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) ➔

1


Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

PROBLEM

How might we (your problem statement)?



Key rules of brainstorming

There are smooth and productive ways to brainstorm.

🗨️ Stay in topic.

💡 Encourage wild ideas.

🙊 Defer judgment.

👂 Listen to others.

🗣️ Go for volume.

👁️ If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2

Brainstorm

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

⌚ 10 minutes

THIRUPHAKSHI R

Asks to enter the weight and height to calculate BMI

Customized perfect workout plans

Calisthenics training

Online nutrition counseling

NANDHINI S

Diet meal recipes

Practice yoga

Walking Daily

Personalized yoga

SNAPREYA A

Fitness blogs

Aerobics training

Paleo diet

Join team sport

KOKILA D

Food maintenance

Deep knowledge about nutritional education

Take enough amount of water

Take enough amount of sleep

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes to groups. 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 can break it up into smaller sub-groups.

⌚ 20 minutes

Nutritional

Personalized nutrition

Key to diet

Food and activity level maintenance

Key to diet

Programs

Online nutrition training

Fitness blogs

Awareness for healthy food

Clarity on nutritional fake news

Step-3: Idea Prioritization

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.

30 minutes

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

- Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
- Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

- Strategy blueprint**
Derive the components of a new idea or strategy.
[Open the template](#)
- Customer experience journey map**
Understand customer needs, motivations, and obstacles for an experience.
[Open the template](#)
- Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) to driving a plan.
[Open the template](#)

[Share template feedback](#)

3.3 Proposed Solution

The project team shall fill in the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Now a days new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition patterns and maintain a healthy diet.
2.	Idea / Solution description	The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc.
3.	Novelty / Uniqueness	The application has several unique features. The main feature is that the user need not have to visit or consult a Nutritionist (or) a Dietician to follow a fit and healthy diet.
4.	Social Impact / Customer Satisfaction	It is used to schedule a diet plan by taking the image of a food item and if we send it, we can get information about each food nutrition like carbohydrates, fat, proteins, vitamins,

		minerals and sugar.
5.	Business Model (Revenue Model)	The app application is easy to install by all the customers but for specific application the customer want to pay.
6.	Scalability of the Solution	Scalable AI pertains to how data models, infrastructures, and algorithms can increase or decrease their complexity, speed, or size at scale in order to best handle the requirements of the situation at hand.

3.4 Problem Solution fit

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) <small>CC</small>	6. CUSTOMER CONSTRAINTS <small>CC</small>	5. AVAILABLE SOLUTIONS <small>AS</small>
Dieters choice Sports person Healthy Eaters Senior citizens	Spending time Internet Facility	To detect the nutrition based on fruits, sugar, Fibre,Protein,calories,etc..

Explore AS, differentiate

Focus on J&P, top into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS <small>J&P</small>	9. PROBLEM ROOT CAUSE <small>RC</small>	7. BEHAVIOUR <small>BE</small>
Less Details Less quality image leads to wrong prediction of nutrients	Laziness Busy schedule	Maintaining their own wait Consulting Doctors

Focus on J&P, top into BE, understand RC

Identify strong TR & EM

3. TRIGGERS <small>TR</small>	10. YOUR SOLUTION <small>SL</small>	8.CHANNELS of BEHAVIOUR <small>CH</small>
Through neighbours, advertisements or through social media	To suggest food based on their health conditions. Enjoy your food but eat less.	Online: Through TV channel Through social media Offline: Throughs newspaper Suggests neighbors
4. EMOTIONS: BEFORE / AFTER <small>EM</small>		
Before:Fear,Unhealthy. After:Healthy,confident		

Identify strong TR & EM

4.REQUIREMENT ANALYSIS

4.1 Functional requirement

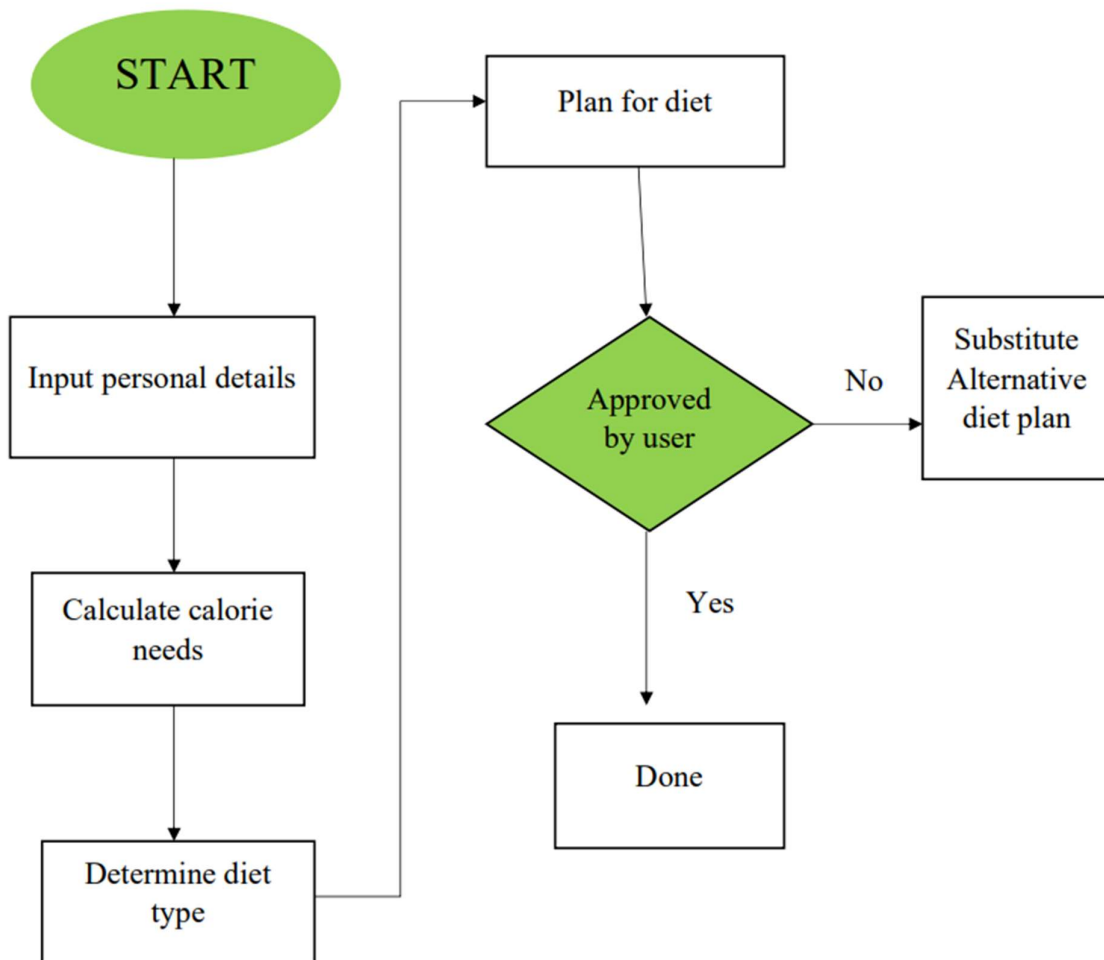
FR.No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Application Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Detail	Detail about health status Select and specifying about health status
FR-4	User Satisfying	The satisfaction of each user is a must, the performance of the application should be optimized in order to keep every user for a long time.
FR-5	Identifying Image	Find the nutritional contents of the food or drink.
FR-6	User Management	Creating a group of people, who are willing to be fit in their health and making them organized in a sample place, through which they can collaborate and also can achieve their goals with others, by encouraging each other.

4.2 Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	<ul style="list-style-type: none">➤ Dataset for all food/drink to identify the nutritional content of them.➤ The user able to use without any difficulties.
NFR-2	Security	<ul style="list-style-type: none">➤ AI powered nutrition analyser for fitness should contain more security in which our data which entered or maintained should be more security.
NFR-3	Reliability	<ul style="list-style-type: none">➤ It is easy to find that is he/she can compare the nutrition-based food with other nutrition related application.
NFR-4	Performance	<ul style="list-style-type: none">➤ The nutritious food to meet their dietary needs and the food preferences for an active and healthy life.
NFR-5	Availability	<ul style="list-style-type: none">➤ Easy to access Data.➤ Fast and Efficient.➤ User Friendly.
NFR-6	Scalability	<ul style="list-style-type: none">➤ Increase the prediction of nutritional in food.➤ AI powered Nutrition Analyzer for fitness provides the clear procedure daily consumption of food and helps the user to maintain a healthy diet.

5.PROJECT DESIGN

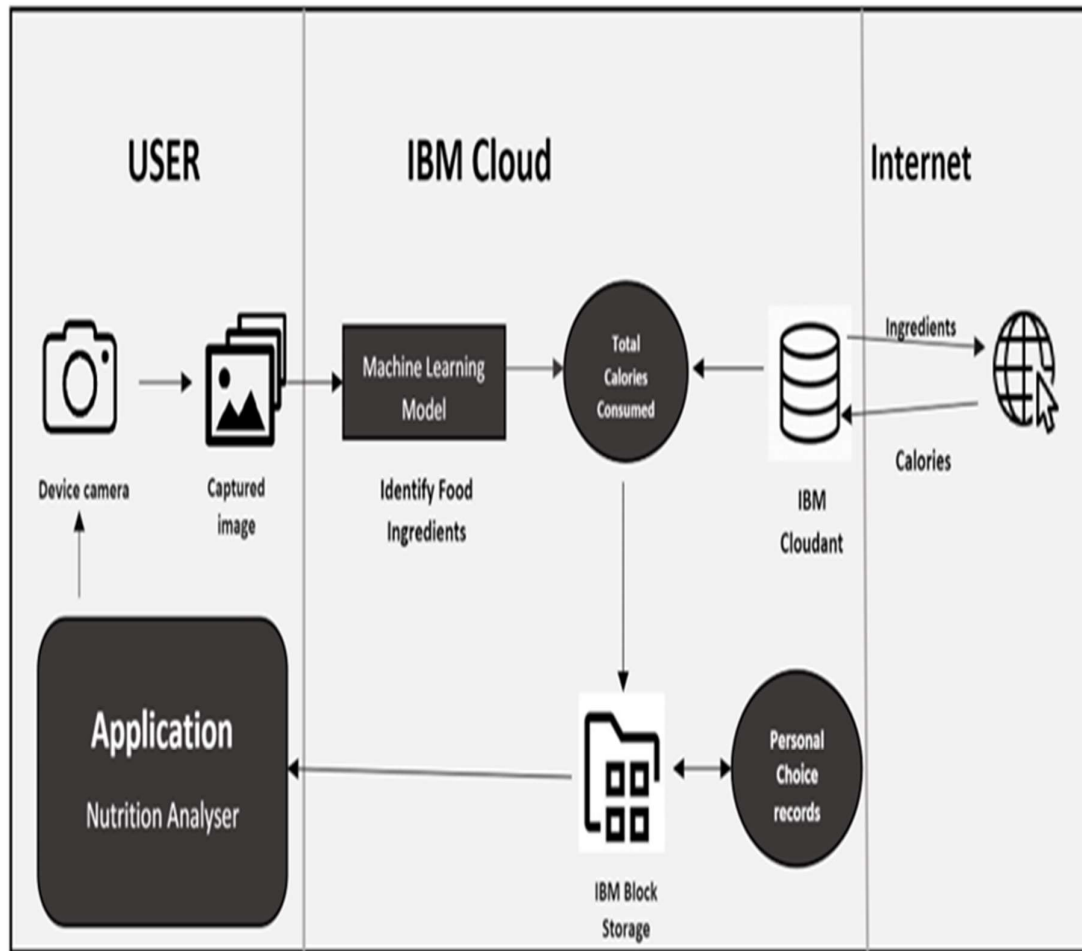
5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.



5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USER NO.- 1	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Login	USER NO.- 2	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
	Dashboard	USER NO.- 3	As a user, I can register for the application through Gmail		Medium	Sprint-1
		USER NO.- 4	As a user, I can log into the application by entering email & password		High	Sprint-1
Customer (Web user)	Login	User No.- 5	As a user, I can register for the application by entering my email, password, and confirming my password.		Low	
Customer Care Executive Administrator	Register	User No. - 6	As a user, I can register for the application through Gmail		High	

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	Download the food nutrition dataset	2	High	THARSHANI
Sprint-1	Data Preprocessing	USN-2	Importing the Dataset into Workspace	1	Medium	THARSHANI KOKILA
Sprint-1		USN-3	Handling Missing data	3	Low	NANDHINI
Sprint-1		USN-4	Feature Scaling	3	Medium	SIVA PRIYA
Sprint-1		USN-5	Data Visualization	3	Low	KOKILA
Sprint-1		USN-6	Splitting Data into Train and set	4	High	THARSHANI
Sprint-1		USN-7	Creating A Dataset with Sliding Windows	4	Medium	NANDHINI
Sprint-2	Model Building	USN-8	Importing The Model Building Libraries	1	HIGH	SIVA PRIYA
Sprint-2		USN-9	Initializing The Model	1	Medium	NANDHINI
Sprint-2		USN-10	Adding CNN Layers	2	High	KOKILA SIVA PRIYA
Sprint-2		USN-11	Adding Dense Layers	3	low	NANDHINI

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2		USN-12	Configure The Learning Process	4	Medium	THARSHANI
Sprint-2		USN-13	Train the model	2	Medium	KOKILA SIVA PRIYA
Sprint-2		USN-14	Save the model	2	Medium	NANDHINI
Sprint-2		USN-15	Test the model	3	High	THARSHANI
Sprint-3	Application Building	USN-16	Create an HTML file	4	Medium	NANDHINI
Sprint-3		USN-17	Build Python code	4	High	SIVA PRIYA
Sprint-3		USN-18	Run the app in local browser	4	Medium	THARSHANI
Sprint-3		USN-19	Showcasing prediction on UI	4	High	KOKILA
Sprint-4	Train the model on IBM	USN-20	Register for IBM Cloud	4	Medium	NANDHINI
Sprint-4		USN-21	Train the ML Model on IBM	4	High	SIVA PRIYA
Sprint-4		USN-22	Integrate Flask with scoring End Point	8	High	THARSHANI

6.2 SPRINT DELIVERY SCHEDULE

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	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

6.3 REPORTS FROM JIRA

OVERALL SPRINT PLAN



7.CODING & SOLUTION

7.1 FEATURE 1:

```
from flask import Flask,render_template,request
# Flask-It is our framework which we are going to use to run/serve our application. #request-for accessing
file which was uploaded by the user on our application. import os
import numpy as np #used for numerical analysis
from tensorflow.keras.models import load_model#to load our trained model from
tensorflow.keras.preprocessing import image
import requests
app = Flask (name, template_folder="templates") # initializing a flask app # Loading the model
model=load_model('nutrition.h5') print ("Loaded model from disk")
@app.route('/') # route to display the home page def home ():
return render_template('home.html') @app.route ('/image1', methods=['GET','POST'])# routes to the
index.html def image1():
return render_template("image.html")
@app.route ('/predict',methods=['GET', 'POST'])# route to show the predictions in a web UI def
launches():
if request.methods=='POST': f=request.files['file'] #requesting the file
basepath=os.path.dirname('file')#storing the file directory
filepath=os.path.join(basepath,"uploads",f.filename)#storing the file in uploads folder
f.save(filepath)#saving the file
img=image.load_img(filepath,target_size=(64,64)) #load and reshaping the image
x=image.img_to_array(img)#converting image to an array x=np.expand_dims(x,axis=0)#changing the
dimensions of the image pred=np.argmax(model.predict(x), axis=1)
print("prediction",pred)#printing the prediction
index=['APPLES','BANANA','ORANGE','PINEAPPLE','WATERMELON']
result=str (index[pred [0]]) x=result
print(x) result=nutrition(result) print(result)
return render_template("0.html", showcase=(result)) import http.client
conn = http.client.HTTPSConnection("calorieninjas.p.rapidapi.com") headers = {
'X-RapidAPI-Key': "e5805fbf62mshf8d7308c0600c2dp197087jsn93407e3cce35",
'X-RapidAPI-Host': "calorieninjas.p.rapidapi.com"
```

```

}
conn.request("GET", "/v1/nutrition?query=Pineapple", headers=headers) res = conn.getresponse()
data = res.read() print(data.decode("utf-8")) import requests
url = "https://calorieninjas.p.rapidapi.com/v1/nutrition" querystring = {"query": "Pineapple"}
headers = {
    "X-RapidAPI-Key": "e5805fbf62mshf8d7308c0600c2dp197087jsn93407e3cce35", "X-RapidAPI-Host":
    "calorieninjas.p.rapidapi.com"
}
response = requests.request("GET", url, headers=headers, params=querystring print(response.text)
if __name__ == "__main__": # running the app
    app.run(debug=False)

```

7.1. Feature 2

home.html

```

<!DOCTYPE html>

<html>
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<meta http-equiv="X-UA-Compatible" content="ie=edge">
<title>Home</title>
<link href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootstrap.min.css" rel="stylesheet">
<script src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.min.js">
</script>
<script src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></script>
<script src="https://cdn.bootcss.com/bootstrap/4.0.0/js/bootstrap.min.js"></script>
<link href="{{ url_for('static', filename='css/main.css') }}" rel="stylesheet">
<style> body
{
background-image: url("https://img.freepik.com/free-photo/top-view-healthy-balanced-vegetarian-
food_1150-370 background-size: cover;
background-repeat: no-repeat; background-attachment: fixed; background-size: 100% 100% ;
}
.bar

```

```

}
h3
{
margin: 0px; padding: 5px;
background-color: #c0df84; width: 400px; color: #000000;
font-family: 'Roboto', sans-serif; font-style: italic;
border-radius: 20px; font-size: 15px;
}
a
{
color: #c0df84; float: center;
text-decoration: none; font-style: normal; padding-right: 20px;
}
a:hover {
background-color: black; color: white;
border-radius: 15px; 0;
font-size: 30px; padding-left: 10px;
}
.div1 {
background-color: lightgrey; width: 500px;
border: 10px solid peach; padding: 20px;
margin: 20px; height: 500px;
}
.header {position: relative;
}
.topnav { overflow: hidden;
top: 0; margin: 0px; z-index: 1; left: 0px; right: 0px;
position: fixed;
background-color: #8B008B; color: white;
box-shadow: 0px 8px 4px grey; overflow: hidden;
padding-left: 20px;
font-family: 'Josefin Sans' font-size: 2px;
width: 100%; height: 8%;
text-align: center;
background-color: #FCAD98;
}

.topnav-right a { float: left; color: black;
text-align: center;
padding: 14px 16px; text-decoration: none; font-size: 10px;
}

.topnav-right a:hover { background-color: #FF69B4; color: black;
}

```

```
.topnav-right a.active { background-color: #DA70D6; color: black;
}
```

```
.topnav-right { float: right;
padding-right:100px;
}
```

```
</style>
```

```
</head>
```

```
<body>
```

```
<!--Brian Tracy-->
```

```
<div class="header">
```

```
<div style="width:50%;float:left;font-size:2vw;text-align:left;color:black; padding-top:1%; padding-
left:5%;"> Nutrition Image Analysis</div>
```

```
<div class="topnav-right"style="padding-top:0.5%;">
```

```
<a class="active" href="{{ url_for('home')}}">Home</a>
```

```
<a href="{{ url_for('image1')}}">Classify</a>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
<br>
```

```
<h1>
```

```
<center>
```

```
<h3>Food is essential for human life and has been the concern of many healthcare conventions. Nowadays
new dietary assessment and nutrition analysis tools enable more opportunities to help people understand
their daily eating habits, exploring nutrition patterns and maintain a healthy diet.Nutritional analysis is the
process of determining the nutritional content of food. It is a
vital part of analytical chemistry that provides information about
the chemical composition, processing, quality control and contamination of food. It ensures compliance
with trade and food laws.</h3>
```

```
</center>
```

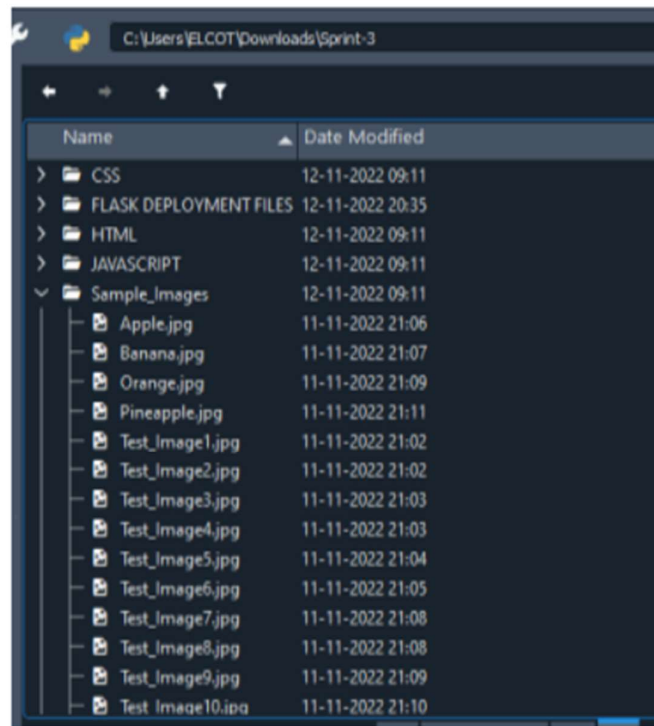
```
</h1>
```

```
</body>
```

```
</html>
```


8. Testing

8.1 TEST CASES



USER ACCEPTANCE TESTING:



APPLE

BANANA

ORANGE

PINEAPPLE

WATERMELON

TEST_IMAGE1



TEST_IMAGE2



TEST_IMAGE3



TEST_IMAGE4



TEST_IMAGE5



TEST_IMAGE6

PERFORMANCE TESTING:

Epoch 1/10

110/110 [=====] - 27s 242ms/step - loss: 0.4205 - accuracy: 0.8861

- val_loss: 48.9065 - val_accuracy: 0.1488 Epoch 2/10

110/110 [=====] - 27s 245ms/step - loss: 0.0082 - accuracy: 0.9989

- val_loss: 62.1670 - val_accuracy: 0.1280 Epoch 3/10

110/110 [=====] - 28s 255ms/step - loss: 0.0014 - accuracy: 1.0000

- val_loss: 66.6759 - val_accuracy: 0.1488 Epoch 4/10

110/110 [=====] - 27s 242ms/step - loss: 3.3364e-04 - accuracy:

1.0000 - val_loss: 70.6794 - val_accuracy: 0.1488 Epoch 5/10

110/110 [=====] - 27s 248ms/step - loss: 1.9990e-04 - accuracy:

1.0000 - val_loss: 74.1865 - val_accuracy: 0.1488 Epoch 6/10

110/110 [=====] - 26s 236ms/step - loss: 4.5090e-04 - accuracy:

1.0000 - val_loss: 75.5190 - val_accuracy: 0.1308 Epoch 7/10

110/110 [=====] - 27s 248ms/step - loss: 1.0600e-04 - accuracy:

1.0000 - val_loss: 78.4789 - val_accuracy: 0.1488 Epoch 8/10

110/110 [=====] - 26s 237ms/step - loss: 7.9529e-05 - accuracy:

1.0000 - val_loss: 80.7918 - val_accuracy: 0.1403 Epoch 9/10

110/110 [=====] - 26s 236ms/step - loss: 9.2201e-05 - accuracy:

1.0000 - val_loss: 80.3610 - val_accuracy: 0.1431 Epoch 10/10

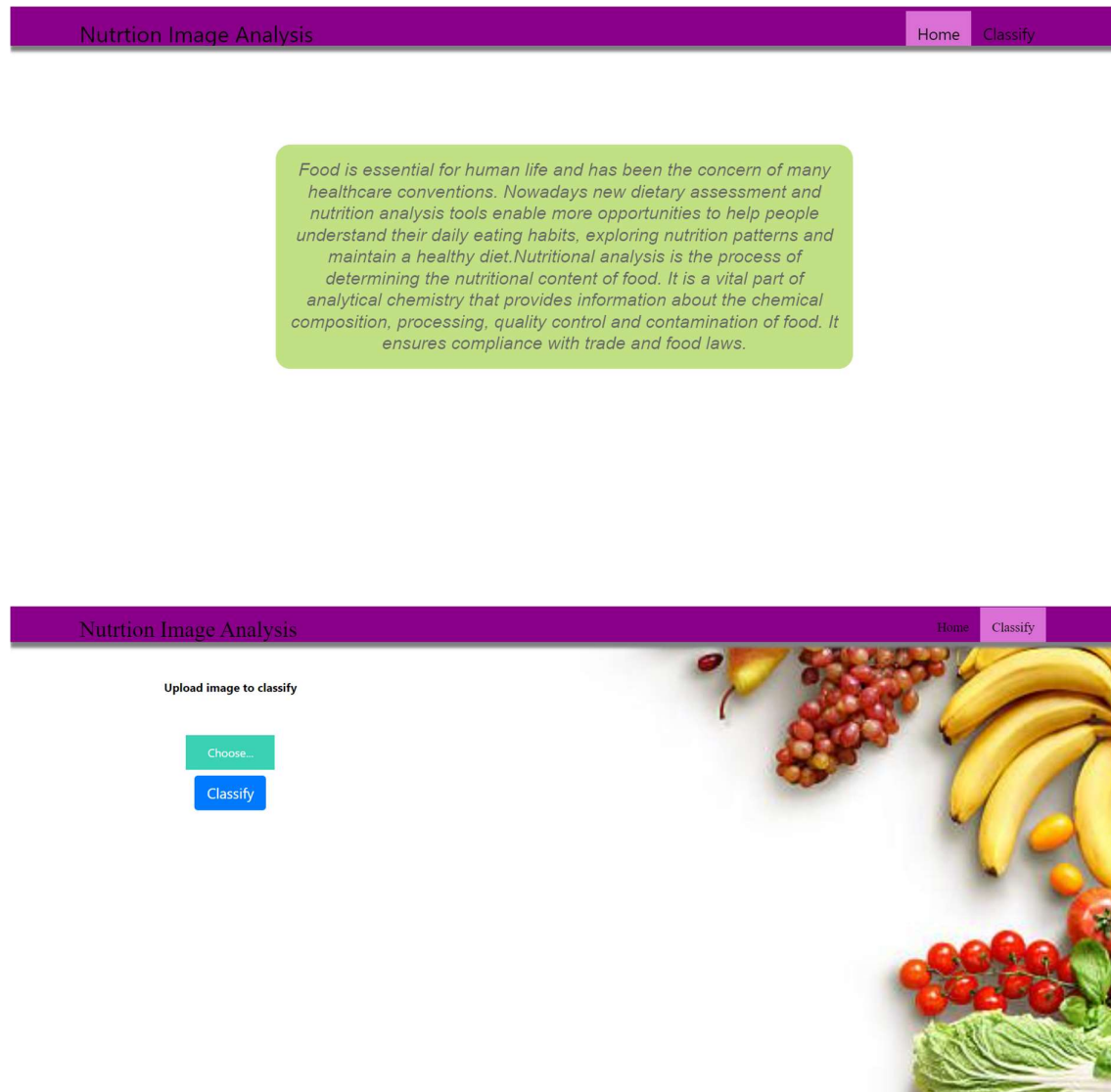
110/110 [=====] - 29s 266ms/step - loss: 9.1324e-05 - accuracy:

1.0000 - val_loss: 83.0943 - val_accuracy: 0.1393

<keras.callbacks.History at 0x7fbc5cb4b10>

9.Results

9.1 Performance Metrics :



10. ADVANTAGES & DISADVANTAGES

Advantages:

1. Nutrition information will be displayed.
2. Easy to use.

Disadvantages:

1. The accuracy of the prediction can be low in some cases.

11. CONCLUSION

The main objective of the project is to predict the image and displays the nutritional content and information. It is mainly developed for fitness person who can be benefited by having healthy diet it also help people understand their daily eating habits, exploring nutrition patterns and maintain a healthy diet thus the nutritional analysis is the process of determining the nutritional content of food

12. FUTURE SCOPE

1. In future, we also plan to include many features like calorie tracker, diet charts etc.
2. We would also like to introduce the features that give how much weight is suitable for your body according to your height.
3. In terms of future improvement, the classification task may be made better by reducing noise from the dataset.
4. Improvement, the classification task may be made better by reducing noise from the dataset. The same research may be done with a larger dataset, more classes, and more photos in each class since a larger dataset increases accuracy by teaching the algorithm additional features and lowers the loss rate.

GitHub Link:

<https://github.com/IBM-EPBL/IBM-Project-45465-1660730180>