

PROJECT REPORT

Date	19 November 2022
Team ID	PNT2022TMID46445
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts

1. INTRODUCTION

1.1 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 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.

1.2 Purpose

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.).

2. LITERATURE SURVEY

2.1 Existing problem

Neutrino delivers nutrition-based data services and analytics to its users and wants to turn into a leading source of the nutrition-related platform. The platform employs NLP and mathematical models from the optimization theory as well as predictive analysis to enable individualized data compilation.

The application relies on Artificial Intelligence to produce custom data related to smart calorie counter powered by AI. Their artificial intelligence learns an individual's tastes, preferences, and body type. All of this is packaged in a comprehensive nutrition and activity tracker.

2.3 Problem Statement Definition

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.).

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

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

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.

- 1. **Brainstorming**
Brainstorming is a collaborative idea-generation process. It's a time to generate ideas, not to judge them.
- 2. **Set the goal**
Think about the problem you're trying to solve and what you want to achieve. It's important to have a clear goal.
- 3. **Learn how to use the facilitation tools**
Facilitation tools help you generate ideas and keep the session on track. It's important to learn how to use them.

Define your problem statement

What problem are you trying to solve? Frame your problem in a few high-level sentences. This will be the focus of your brainstorming.

How might we [your problem statement]?

Key rules of brainstorming
To get the most out of your brainstorming session:

- 1. Stay on topic
- 2. Stay positive
- 3. Stay focused
- 4. Stay creative
- 5. Stay open-minded
- 6. Stay collaborative
- 7. Stay respectful
- 8. Stay organized
- 9. Stay motivated
- 10. Stay energized

Brainstorm

Write down any ideas that come to mind. That's the whole point of brainstorming.

10 minutes

MOHAMMED JAWAD J

1. I want to create a new product.	2. I want to create a new service.	3. I want to create a new experience.
4. I want to create a new brand.	5. I want to create a new community.	6. I want to create a new culture.
7. I want to create a new way of thinking.	8. I want to create a new way of living.	9. I want to create a new way of working.
10. I want to create a new way of playing.	11. I want to create a new way of learning.	12. I want to create a new way of growing.

SANTHOSH S

1. I want to create a new product.	2. I want to create a new service.	3. I want to create a new experience.
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10. I want to create a new way of playing.	11. I want to create a new way of learning.	12. I want to create a new way of growing.

SRINIVASAN V

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SARATHI S

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Need some inspiration?

Get some ideas from our collection of examples. It's a great way to get started.

Get example

Group ideas

Take turns sharing your ideas with your team. It's a great way to get started.

20 minutes

1. I want to create a new product.

2. I want to create a new service.

3. I want to create a new experience.

4. I want to create a new brand.

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Prioritize

Your ideas are all great, but which ones are the most important? Prioritize your ideas based on their importance and feasibility.

20 minutes

Importance

Feasibility

1. I want to create a new product.

2. I want to create a new service.

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4. I want to create a new brand.

5. I want to create a new community.

6. I want to create a new culture.

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10. I want to create a new way of playing.

11. I want to create a new way of learning.

12. I want to create a new way of growing.

After you collaborate

You can now start working on your ideas. It's a great way to get started.

20 minutes

1. I want to create a new product.

2. I want to create a new service.

3. I want to create a new experience.

4. I want to create a new brand.

5. I want to create a new community.

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11. I want to create a new way of learning.

12. I want to create a new way of growing.

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	A nutrition analyser with AI powered fruit classifier based on the features to provide nutritional values like sugar, protein, fibre, vitamins, minerals etc to Fitness Enthusiasts. The user must also be aware of the nutritional content
2.	Idea / Solution description	<ol style="list-style-type: none">1. To create an application to monitor and track their health condition and helping the people to improve their health condition.2. Provide nutritional facts based on the obtained data
3.	Novelty / Uniqueness	<ol style="list-style-type: none">1. CNN based fruit classifier that supports nutrition analyser that provides nutrition values of the fruit.2. Availability of fitness plans with add-on bonuses3. Allowing for diet flexibility helps to promote a healthy and effective eating pattern
4.	Social Impact / Customer Satisfaction	Improving the health condition, people can concentrate on their daily duties and works. Constant calorie management monitoring results in a fitness mindset
5.	Business Model (Revenue Model)	<ul style="list-style-type: none">• Offering monthly/yearly subscription for premium features.• Consultation with nearest trainers and nutritionist for personalized plans.
6.	Scalability of the Solution	<ul style="list-style-type: none">• Storage requirements of a specific food.• User friendly UI for everyone to use and get benefit from it.• Implementing in mobile app.

3.4 Problem Solution fit

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns

Purpose:

- Solve complex problems in a way that fits the state of your customers.
- Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- Sharpen your communication and marketing strategy with the right triggers and messaging.
- Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Fitness enthusiasts and People who want to lead a healthy life.	6. CUSTOMER CONSTRAINTS CC The constraints that prevent our customers to access out solution are network issues and time.	5. AVAILABLE SOLUTIONS AS Exercise, Yoga and Aerobic are Existing solution Pros: our solution is the keys is to form workout habits that lead to long lasting changes to lifestyle Cons: No proper guidelines for fitness enthusiasts	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P By providing nutritional facts to enthusiasts. It will lead them to healthy life. This would be the main job to be done.	9. PROBLEM ROOT CAUSE RC The main root <u>causes</u> : <ul style="list-style-type: none"> • Lack of nutritional intake and knowledge • Improper diet • No guidance 	7. BEHAVIOUR BE The customers who have issues with health,nutrition, fitness will ask query to nutritionist. After telling the issues of their health status. It will analyze the customer's status, finally, <u>solution will</u> be given by nutrition analyst	
Identify strong TR & EM	3. TRIGGERS TR After continuous advertisements of our application, and hearing feedback from their friends, <u>neighbour</u> the customer will get motivated to use our application.	10. YOUR SOLUTION SL By providing service of nutritional facts with calculating calories intake of user/who wants to be fit and healthy with high accuracy level And also demonstrates with <u>instructors</u> to intake calories	8. CHANNELS of BEHA/IOUR CH 8.1 ONLINE User will scan their food through an application 8.2 OFFLINE User will perform based upon the nutritional facts.	Identify strong TR & EM
	4. EMOTIONS: BEFORE / AFTER EM Before using our application, customer will face insecurity and bad health. After using our application, customer get good health and <u>self motivated</u> .			

4. REQUIREMENT ANALYSIS

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	Authentication	User will be authenticated and can access the application (Registration)
FR-2	Business Rules	Providing nutritional facts to user through processing foods
FR-3	Image processing	To understand the nutrition package with the images
FR-4	System function	Nutritional facts will be based upon image that user uploaded
FR-5	User profile	Users have to register themselves. It contains personal information
FR-6	Nutrition Content	Based on given information will calculate nutritional level
FR-7	Dashboard/Progress	Generates report to users

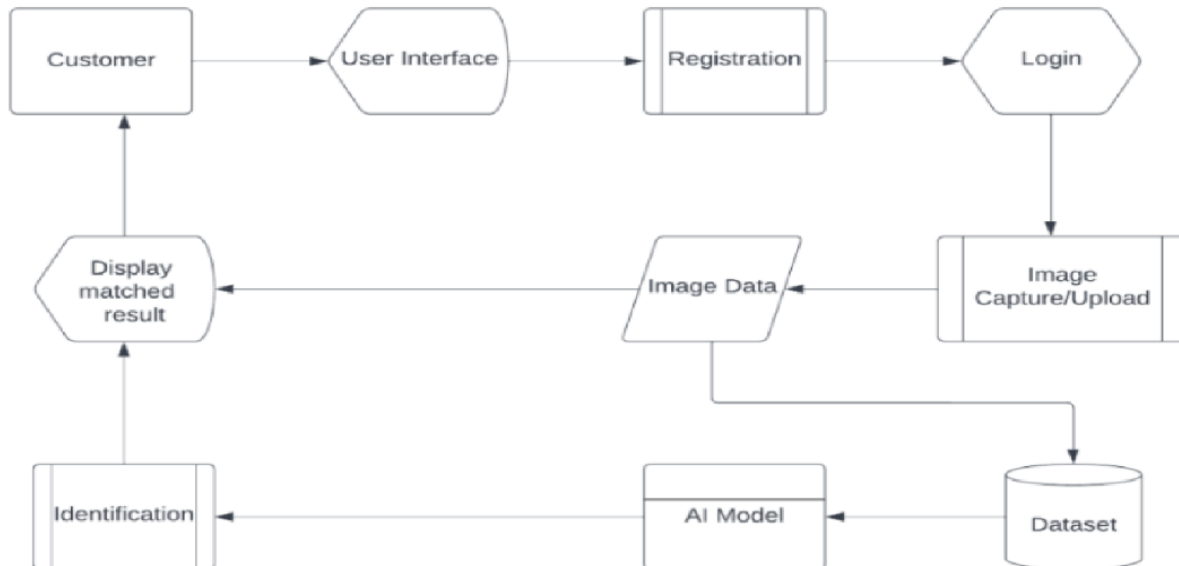
4.2 Non-functional Requirements:

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

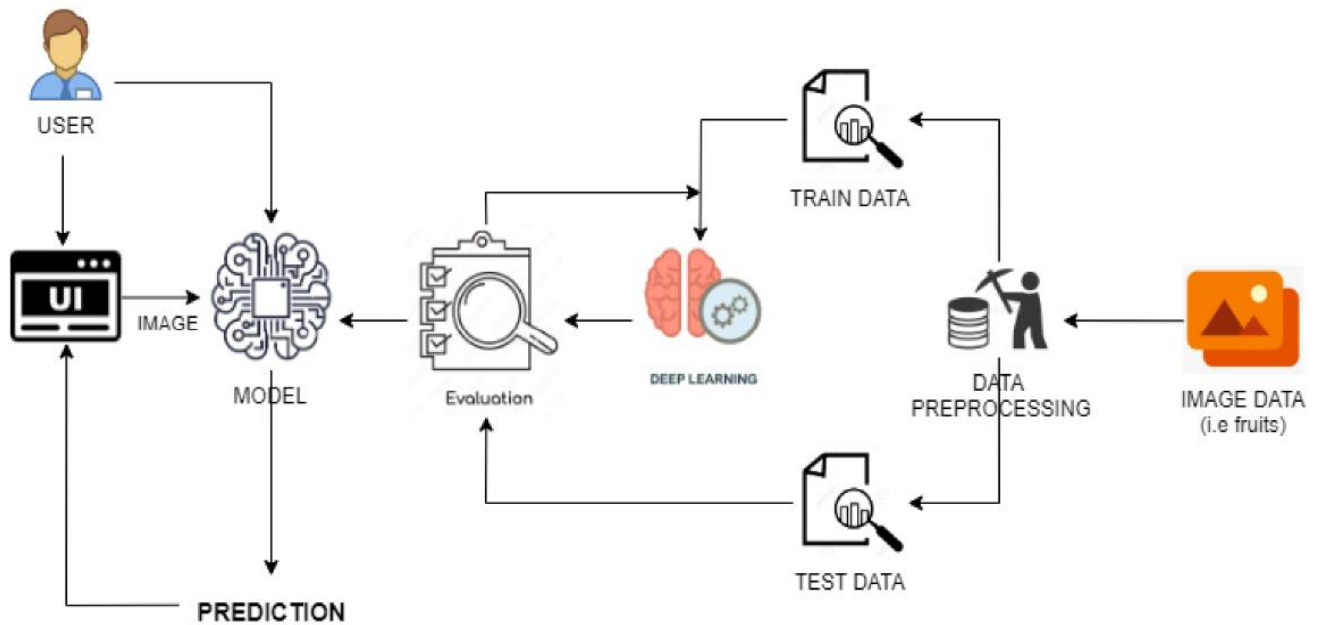
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	User friendly interface for using the application
NFR-2	Security	User's information are secured in server
NFR-3	Reliability	Authenticated user only can access the app
NFR-4	Performance	Better performance comparing to other apps
NFR-5	Availability	Most of the information needed for users are available without any subscription
NFR-6	Scalability	The application is very user friendly to everyone and can get benefit from it.

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 (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
	Login	USN-2	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
	Registration	USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook	Low	Sprint-2
	Registration	USN-4	As a user, I can register for the application through Gmail	I can register using mail	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	As a user I can log on to website on demand	High	Sprint-1
	Access	USN-6	As a user I can give access to camera	I can give access	Medium	Sprint-1
	Webpage	USN-7	As a user I can upload the input fruit image to the website	I can upload the images	High	Sprint-2
	Calorie Tracker	USN-8	As a user, I can either enter the food intake manually or either through camera image capturing 5x daily	My food intake is calculated & analysed on a daily basis	Medium	Sprint-2
	Diet Plan	USN-9	As a user, I can formulate my diet plan by myself according to the given essential nutrients.	The AI model checks whether my diet meets the required nutrient levels.	Low	Sprint-3
Customer (Web user)	Registration	USN-10	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account or dashboard	High	Sprint-3
Customer Care Executive	Solving customer queries	USN-11	As a user I should be able to get support from customer care in case if the application failed	I can obtain responses & guidelines from it	Medium	Sprint-2
Administrator	Database maintenance	US-12	As an administrator, I can handle all the user information & image datasets captured by the AI model.	I can ensure data safety & provide various assurance towards user security	High	Sprint-4

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	5	High	Team member- 2,3
Sprint-1	Login	USN-2	As a user, I will receive confirmation email once I have registered for the application	5	High	Team member-1,2
Sprint-2	Dashboard	USN-3	As a user, I can register for the application through Facebook	10	Low	Team member-2,4
Sprint-1	Details about nutrition analysis	USN-4	As a user, I can register for the application through Gmail	5	Medium	Team member-1,3
Sprint-1	Login and logout	USN-5	As a user, I can log into the application by entering email & password	5	High	Team member-2,4
Sprint-2	Webpage	USN-6	As a user I can able to take pictures of various fruits and upload it to the webpage	10	High	Team member-1,3
Sprint-3	Details	USN-7	As a user I must receive the report containing the nutritional contents of various fruits	20	High	Team member-2,3
Sprint-4	Providing customer with support	USN-8	As a user, I need support from the developers in case of any queries	20	High	Team member-1,2

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-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)

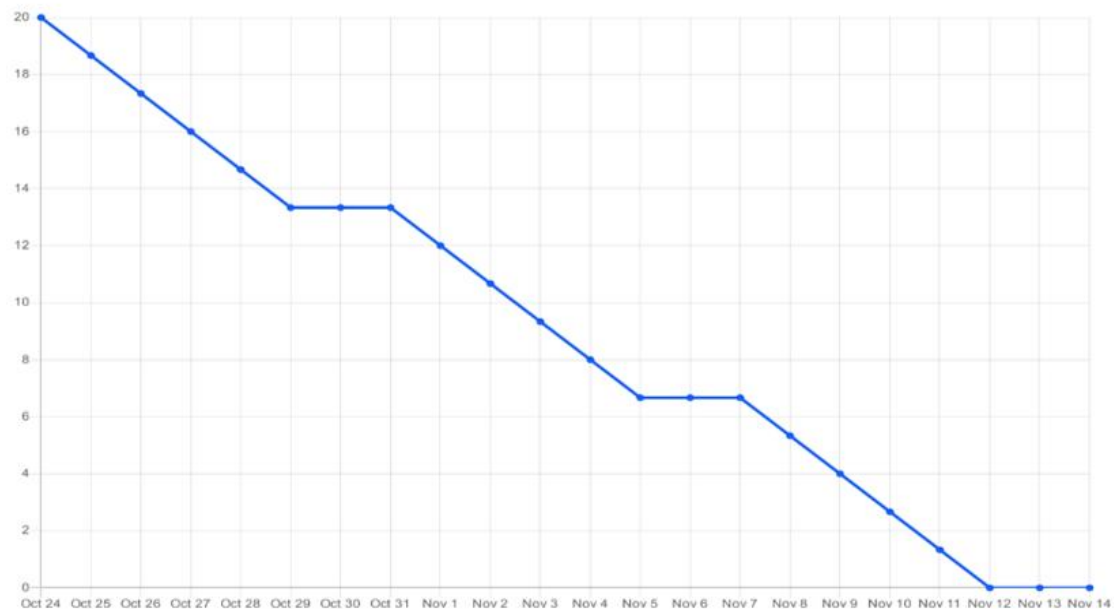
$$AV = \frac{\text{sprint duration}}{\text{velocity}}$$

$$= 20/6$$

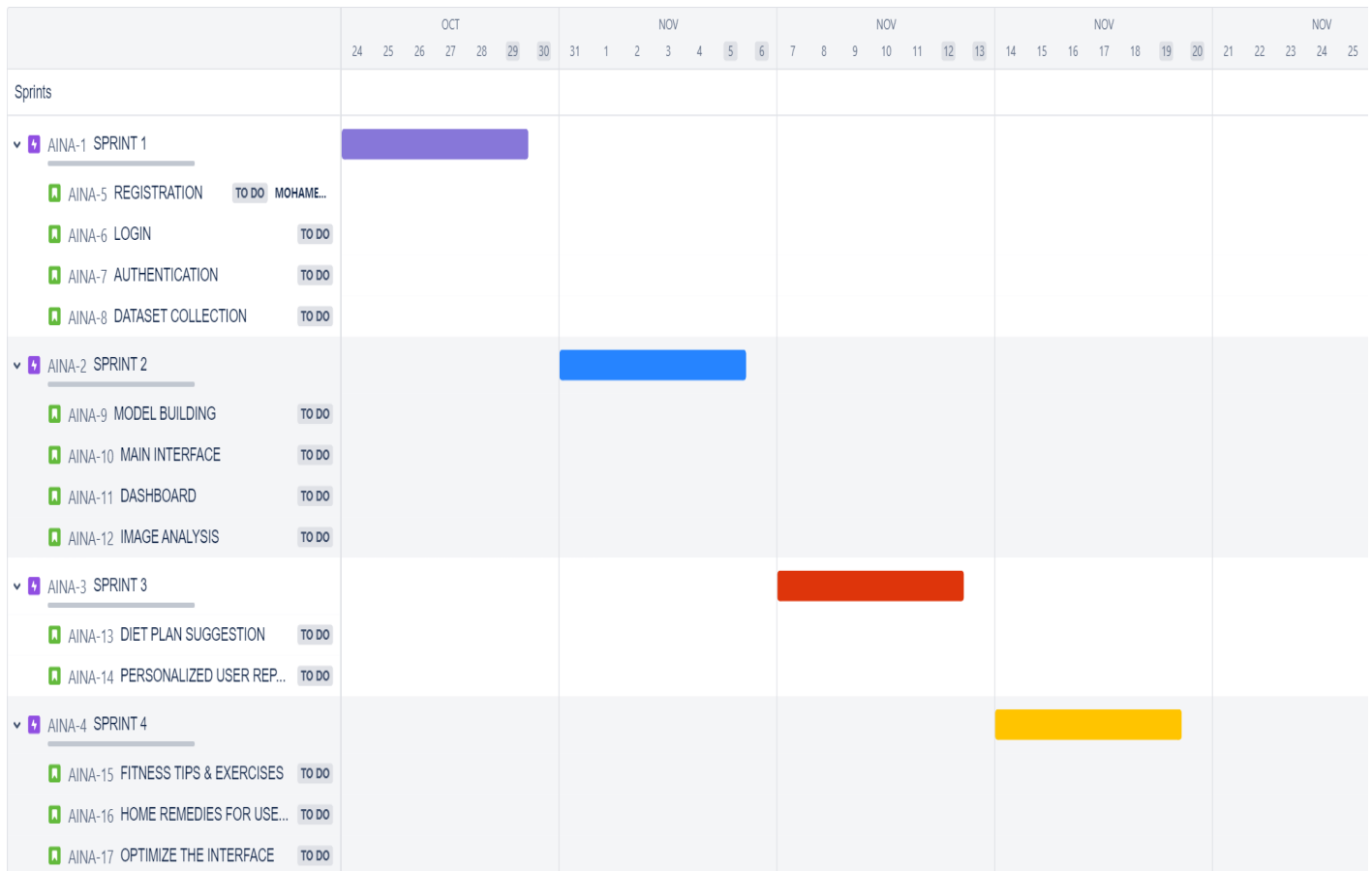
$$= 3.3$$

6.2 Sprint Delivery Schedule

Burndown Chart



6.3 Reports from JIRA



7. CODING & SOLUTIONING

Now that we have trained our model, let us build our flask application which will be Running in our local browser with a user interface.

In the flask application, the input parameters are taken from the HTML page These factors are then given to the model to predict the type of food and to know the nutrition content in it. In order to know the nutrition content we will be using an API in this project

7.1 FEATURE 1

Data Collection

Download the dataset [here](#)

```
[ ] from google.colab import drive
    drive.mount('/content/drive')
```

Mounted at /content/drive

```
[ ] cd/content/drive/MyDrive/Colab Notebooks
```

/content/drive/MyDrive/Colab Notebooks

```
[ ] # Unzipping the dataset
    !unzip 'Dataset.zip'
```

Image Preprocessing

```
[ ] from keras.preprocessing.image import ImageDataGenerator
```

Image Data Augmentation

```
[ ] train_datagen = ImageDataGenerator(rescale=1./255, shear_range=0.2, zoom_range=0.2, horizontal_flip=True)
    test_datagen = ImageDataGenerator(rescale=1./255)
```

Applying Image DataGenerator Functionality To Trainset And Testset

```
▶ x_train = train_datagen.flow_from_directory(
    r'/content/drive/MyDrive/Colab Notebooks/Dataset/TRAIN_SET',
    target_size=(64, 64), batch_size=5, color_mode='rgb', class_mode='sparse')
x_test = test_datagen.flow_from_directory(
    r'/content/drive/MyDrive/Colab Notebooks/Dataset/TEST_SET',
    target_size=(64, 64), batch_size=5, color_mode='rgb', class_mode='sparse')
```

Model Building

1. Importing The Model Building Libraries

```
[ ] import numpy as np
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras import layers
from tensorflow.keras.layers import Dense, Flatten
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Dropout
```

2. Initializing The Model

```
[ ] classifier = Sequential()
```

3. Adding CNN Layers

```
[ ] classifier = Sequential()
classifier.add(Conv2D(32, (3, 3), input_shape=(64, 64, 3), activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2, 2)))
classifier.add(Conv2D(32, (3, 3), activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2, 2)))
classifier.add(Flatten())
```

4. Adding Dense Layers

```
[ ] classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))
```



```
classifier.summary()
```

Model: "sequential_1"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 62, 62, 32)	896

5. Configure The Learning Process

```
[ ] classifier.compile(optimizer='adam', loss='sparse_categorical_crossentropy', metrics=['accuracy'])
```

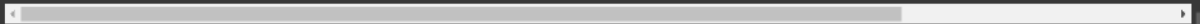
6. Train The Model

```
[ ] classifier.fit_generator(generator=x_train, steps_per_epoch = len(x_train), epochs=28, validation_data=x_test, validation_steps = len(x_test))
```

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:2: UserWarning: 'Model.fit_generator' is deprecated and will be removed in a future version. P]

Epoch 1/28

494/824 [=====] - ETA: 6:52 - loss: 0.7194 - accuracy: 0.7174



7. Saving The Model

```
[ ] classifier.save('nutrition.h5')
```

8. Testing The Model

```
[ ] from tensorflow.keras.models import load_model  
from keras.preprocessing import image  
model = load_model("nutrition.h5")
```

```
from tensorflow.keras.models import load_model  
from tensorflow.keras.preprocessing import image  
model = load_model("nutrition.h5")  
img = image.load_img(r'/content/drive/MyDrive/Colab Notebooks/Sample_Images/Test_Image1.jpg', grayscale=False, target_size= (64,64))  
x = img_to_array(img)  
x = np.expand_dims(x, axis = 0)  
predict_x=model.predict(x)  
classes_x=np.argmax(predict_x,axis=-1)  
classes_x
```

1/1 [=====] - 0s 62ms/step
array([0])

```
[ ] index=['APPLES', 'BANANA', 'ORANGE', 'PINEAPPLE', 'WATERMELON']  
result=str(index[classes_x[0]])  
result
```

7.2 FEATURE 2

The screenshot displays a VS Code editor interface with the following components:

- Explorer View (Left):** Shows a file tree for the project 'IBM-PROJECT-47847-1660802869'. The tree includes folders for 'Application Building', 'Assignments', 'Data Collection', 'Final Deliverables', 'Image Preprocessing', 'Model Building', 'Prerequisites', 'Project Design & Planning', 'Project Development Phase', 'Sprint 1', 'Sprint 2', 'Sprint 3 / Flask', 'Static', 'css', 'images', 'js', 'templates', and 'uploads'. The 'MODEL BUILDING.ipynb' file is selected.
- Model Building.ipynb (Middle):** Contains HTML code for a web page. The code includes a DOCTYPE declaration, meta tags for charset, viewport, and title, and a link to a stylesheet. The body contains a navigation bar with links for 'Home' and 'Classify', and a main content area with a paragraph about nutrition analysis.
- app.js (Bottom):** Contains JavaScript code for handling file uploads and API calls. The code includes a function to read the file as a data URL, a function to handle the 'click' event on the 'Classify' button, and a function to send a POST request to the '/predict' endpoint.

The status bar at the bottom indicates the current file is 'app.js' and the editor is in 'JavaScript' mode. The system tray at the bottom shows the date and time as 12:27 AM on 21-11-2022.

IBM

app.js - IBM-Project-47847-166002869

Download file | iLovePDF

github.dev/IBM-EPBL/IBM-Project-47847-166002869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

EXPLORER

IBM-PROJECT-47847-166002869...

- Application Building
- Assignments
- Data Collection
- Final Deliverables
- Image Preprocessing
- Model Building
 - MODEL BUILDING.ipynb
- Prerequisites
- Project Design & Planning
- Project Development Phase
 - Sprint 1
 - DATA COLLECTION & IMAGE PREPROCES...
 - Sprint 2
 - MODEL BUILDING.ipynb
 - Sprint 3 / Flask
 - Sample_Images
 - Static
 - css
 - 1.txt
 - styles.css
 - images
 - js
 - 1.txt
 - app.js
 - Templates
 - Uploads
 - Sprint 4
 - Project Flow
 - OUTLINE
 - TIMELINE

MODEL BUILDING.ipynb

Project Development Phase > Sprint 3 > Flask > Static > js > app.js

```
1 const chooseButton = document.querySelector('button.primary-button'),
2   classifyButton = document.querySelector('button.secondary-button');
3 let userFile;
4
5 // Event Listeners
6 chooseButton.addEventListener('click', (e)=>{
7   // Creating an input element to select the file
8   const input = document.createElement('input');
9   input.setAttribute('type', 'file');
10  input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
11  input.setAttribute('name', 'file');
12  input.click();
13  input.onchange = function(){
14    const imageView = document.querySelector('#image-viewer');
15
16    // Displaying Image selected on the web page
17    const reader = new FileReader();
18    reader.onload = function(event){
19      imageView.src = event.target.result;
20      imageView.style.marginTop = '2rem';
21      imageView.style.height = '300px';
22      imageView.style.width = '300px';
23    }
24    reader.readAsDataURL(input.files[0]);
25    userFile = input.files[0];
26  }
27 })
28
29 classifyButton.addEventListener('click', (e)=> {
30   const formData = new FormData();
31   formData.append('file', userFile);
32   fetch('/predict', {
33     method: 'POST',
34     body: formData
35   })
```

Ln 1, Col 1 Spaces: 4 UTF-8 CRLF JavaScript Layout: US

IBM

styles.css - IBM-Project-47847-166002869

Download file | iLovePDF

github.dev/IBM-EPBL/IBM-Project-47847-166002869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

EXPLORER

IBM-PROJECT-47847-166002869...

- Application Building
- Assignments
- Data Collection
- Final Deliverables
- Image Preprocessing
- Model Building
 - MODEL BUILDING.ipynb
- Prerequisites
- Project Design & Planning
- Project Development Phase
 - Sprint 1
 - DATA COLLECTION & IMAGE PREPROCES...
 - Sprint 2
 - MODEL BUILDING.ipynb
 - Sprint 3 / Flask
 - Sample_Images
 - Static
 - css
 - 1.txt
 - styles.css
 - images
 - js
 - Templates
 - Uploads
 - Sprint 4
 - Project Flow
 - Project Objectives
 - Project Structure
 - OUTLINE
 - TIMELINE

MODEL BUILDING.ipynb

Project Development Phase > Sprint 3 > Flask > Static > css > # styles.css > *

```
107 text-decoration: underline;
108 align-items: center;
109 }
110 #output h3{
111   margin-bottom: 4rem;
112 }
113 #output > p{
114   text-decoration: underline;
115   display: none;
116 }
117 #classify-main > div p{
118   text-align: center;
119   overflow-wrap: break-word;
120   max-width: 50rem;
121   font-size: 1.3rem;
122   font-weight: 500;
123   margin-top: 2rem;
124 }
125 #output-wrapper{
126   background: rgba(243, 243, 243, 0.7);
127   margin-top: 2rem;
128   padding: 2rem;
129   border-radius: 10px;
130   display: none;
131 }
132 #output-wrapper > p:first-child{
133   margin-top: none;
134 }
135 #output-wrapper > p:last-child{
136   margin-top: 4rem;
137 }
138
```

Ln 1, Col 1 Spaces: 4 UTF-8 CRLF CSS Layout: US

IBM

styles.css - IBM-Project-47847-1

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github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

EXPLORER

IBM-PROJECT-47847-1660802869

Application Building

Assignments

Data Collection

Final Deliverables

Image Preprocessing

Model Building

MODEL BUILDING.ipynb

Prerequisites

Project Design & Planning

Project Development Phase

Sprint 1

DATA COLLECTION & IMAGE PREPROCES...

Sprint 2

MODEL BUILDING.ipynb

Sprint 3 / Flask

Sample_Images

Static

css

1.txt

styles.css

images

js

Templates

Uploads

Sprint 4

Project Flow

Project Objectives

Project Structure

OUTLINE

TIMELINE

MODEL BUILDING.ipynb

styles.css

Project Development Phase > Sprint 3 > Flask > Static > css > # styles.css > *

75 transition: 0.25s;

76 }

77

78 /* Home Page */

79 #home-main{

80 background: var(--primary-color-opacity);

81 margin: 23rem auto;

82 width: 70rem;

83 padding: 2rem;

84 font-size: 1.5rem;

85 border-radius: 15px;

86 text-align: center;

87 font-style: italic;

88 }

89

90 /* Classify Page */

91 #classify-main{

92 background: none;

93 width: 50rem;

94 margin: 13rem auto;

95 display: grid;

96 grid-template-columns: 1fr 2fr;

97 grid-gap: 3rem;

98 }

99

100 #classify-main h3{

101 margin-bottom: 2rem;

102 }

103 #classify-main .secondary-button{

104 margin-top: 2rem;

105 }

106 #classify-main > div, #output{

107 display: flex;

108 flex-direction: column;

109 align-items: center;

110 }

Ln 1, Col 1 Spaces: 4 UTF-8 CRLF CSS Layout: US

25°C Mostly cloudy

Search

12:27 AM 21-11-2022

IBM

styles.css - IBM-Project-47847-1

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github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

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styles.css

Project Development Phase > Sprint 3 > Flask > Static > css > # styles.css > *

36 }

37 .primary-button{

38 background: var(--primary-color);

39 }

40 .secondary-button{

41 background: rgb(50, 50, 208);

42 }

43 .primary-button:hover, .secondary-button:hover{

44 cursor: pointer;

45 }

46

47 /* Nav bar */

48 nav{

49 display: flex;

50 justify-content: space-between;

51 align-items: center;

52 padding: 0 2rem;

53 background: rgba(243, 243, 243, 0.8);

54 }

55 nav > h2{

56 font-size: 2.5rem;

57 font-weight: 500;

58 }

59 nav > ul{

60 display: flex;

61 }

62 nav > ul > li{

63 padding: 2rem;

64 font-size: 1.3rem;

65 transition: 0.25s;

66 }

67 nav > ul > li:hover{

68 background: var(--primary-color-opacity);

69 }

70 nav > ul > li:hover > a{

Ln 1, Col 1 Spaces: 4 UTF-8 CRLF CSS Layout: US

25°C Mostly cloudy

Search

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github.dev/IBM-EPBL/IBM-Project-47847-166080286/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

EXPLORERMODEL BUILDING.ipynb# styles.css

IBM-PROJECT-47847-166080286...> Application Building> Assignments> Data Collection> Final Deliverables> Image Preprocessing> Model BuildingMODEL BUILDING.ipynbPrerequisites> Project Design & Planning> Project Development Phase> Sprint 1> DATA COLLECTION & IMAGE PREPROCESSING...> Sprint 2> MODEL BUILDING.ipynb> Sprint 3 / Flask> Sample_Images> Static> css1.txtstyles.cssimagesjsTemplatesUploads> Sprint 4> Project Flow> Project Objectives> Project Structure> OUTLINE> TIMELINE

Project Development Phase > Sprint 3 > Flask > Static > css > # styles.css

```
1 {
2   box-sizing: border-box;
3   margin: 0;
4   padding: 0;
5 }
6 :root{
7   --primary-color: lightgreen;
8   --primary-color-opacity: rgba(144, 238, 144, 0.8);
9 }
10 body {
11   background: url("../images/img.jpg") no-repeat center top/cover;
12   font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
13 }
14 ul{
15   list-style: none;
16 }
17 a{
18   text-decoration: none;
19 }
20
21 /* Classes */
22 .page-selected{
23   background: var(--primary-color);
24   color: white;
25 }
26 .page-selected a{
27   color: white;
28 }
29 .primary-button, .secondary-button{
30   padding: 0.8rem;
31   font-size: 1.2rem;
32   border: none;
33   color: white;
34   font-weight: 500;
35   border-radius: 5px;
```

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github.dev/IBM-EPBL/IBM-Project-47847-166080286/blob/main/Model%20Building/MODEL%20BUILDING.ipynb

EXPLORERMODEL BUILDING.ipynbimage.html

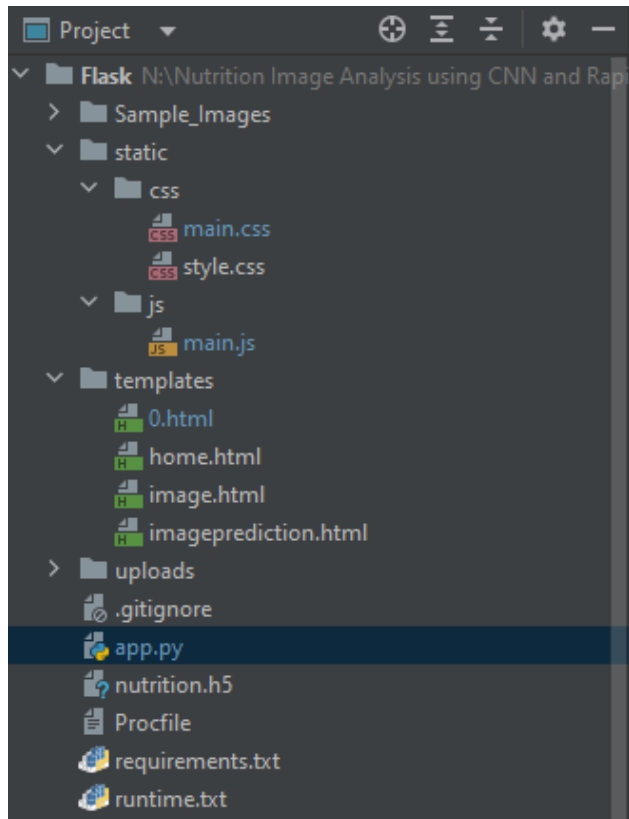
IBM-PROJECT-47847-166080286...> Application Building> Assignments> Data Collection> Final Deliverables> Image Preprocessing> Model BuildingMODEL BUILDING.ipynbPrerequisites> Project Design & Planning> Project Development Phase> Sprint 1> DATA COLLECTION & IMAGE PREPROCESSING...> Sprint 2> MODEL BUILDING.ipynb> Sprint 3 / Flask> Sample_Images> Static> css1.txtstyles.cssimagesjsapp.jsTemplates> home.html> image.htmlUploads> OUTLINE> TIMELINE

Project Development Phase > Sprint 3 > Flask > Templates > image.html

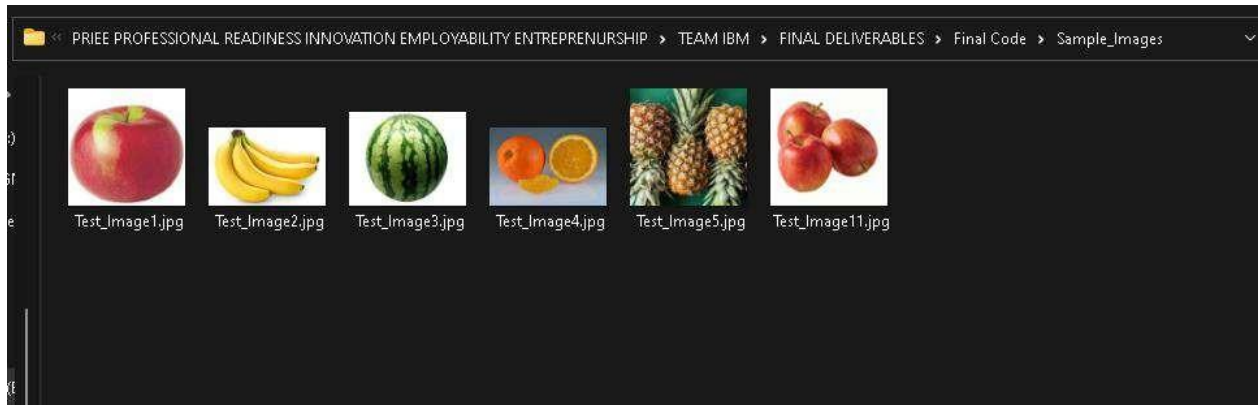
```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <title>AI based analyzer for Fitness Enthusiasts </title>
8   <link rel="stylesheet" href="{url_for('static', filename='css/styles.css')}">
9 </head>
10 <body>
11   <nav>
12     <h2> <span>Nutrition</span> Image Analysis</h2>
13     <ul>
14       <li><a href="/">Home</a></li>
15       <li class="page-selected"><a href="/image">Classify</a></li>
16     </ul>
17   </nav>
18   <main id="classify-main">
19     <div>
20       <h3>Choose an image to classify</h3>
21       <button class="primary-button">Choose</button>
22       <img src="" alt="" id="image-viewer">
23       <button class="secondary-button">Classify</button>
24     </div>
25     <div id="output">
26       <h3>Output</h3>
27       <p>Food is classified as:</p>
28       <div id="output-wrapper">
29         <p id="output-result"></p>
30         <p id="output-api-result"></p>
31       </div>
32     </div>
33   </main>
34 </body>
35 <script src="{url_for('static', filename='js/app.js')}"></script>
```

8.TESTING

8.1 Test Cases



8.2 User Acceptance Testing



9.RESULTS

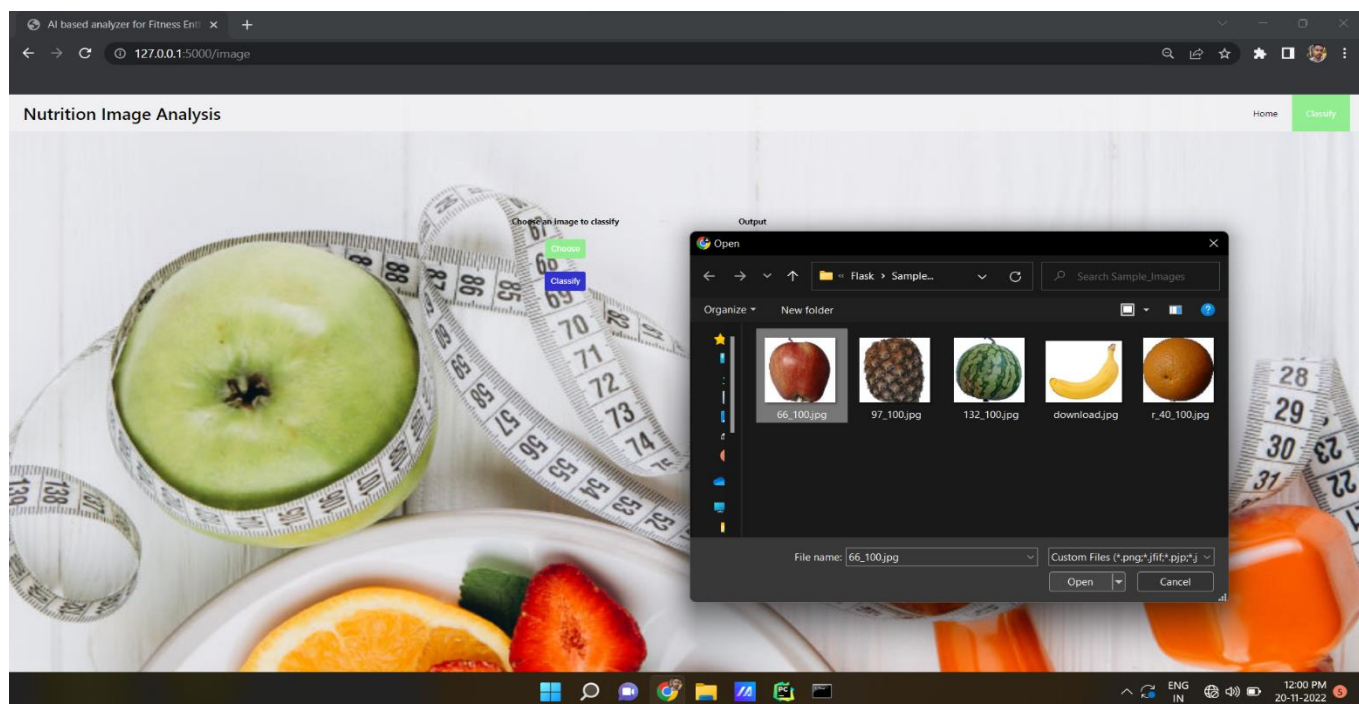
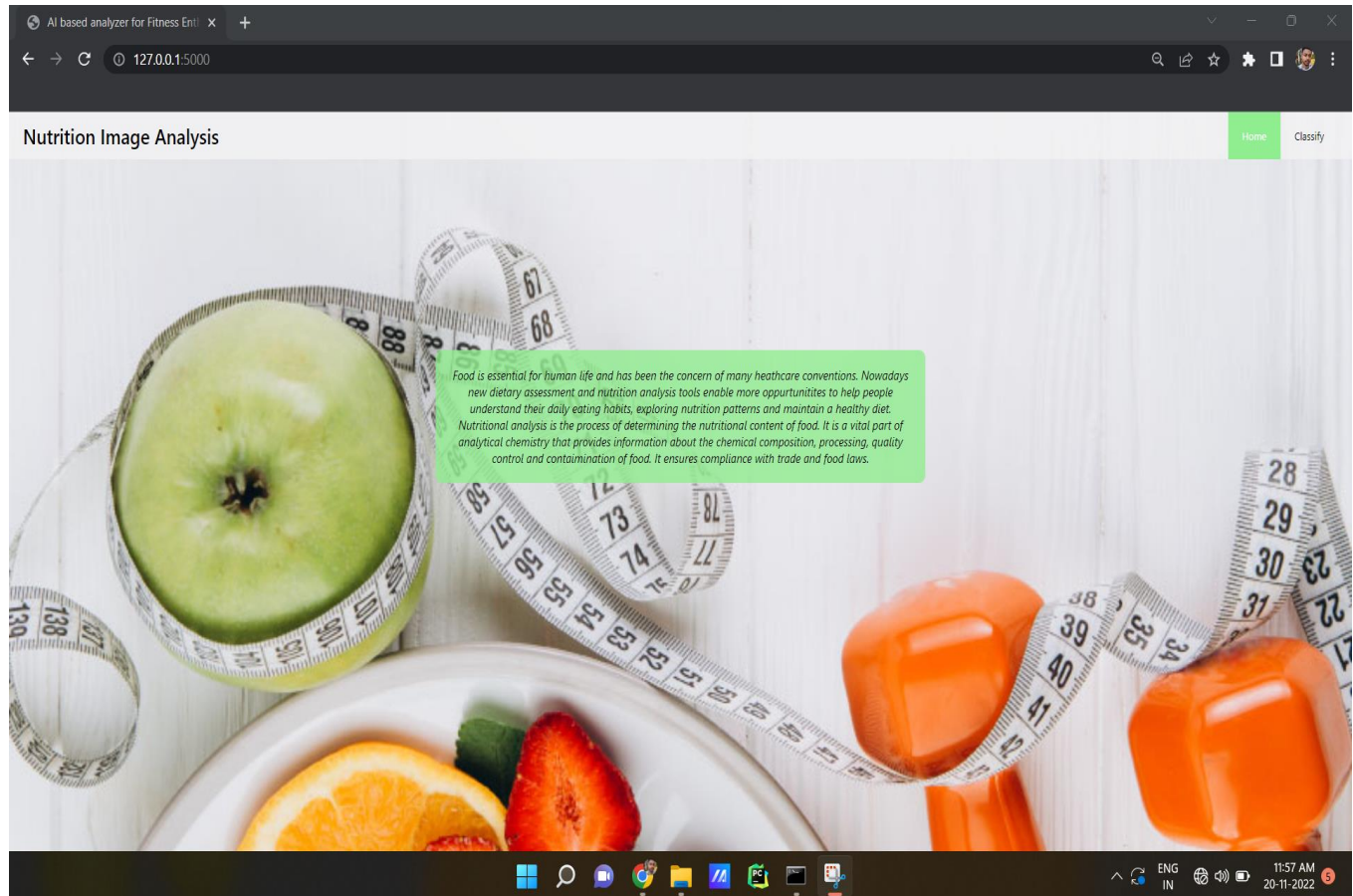
9.1 Performance Metrics

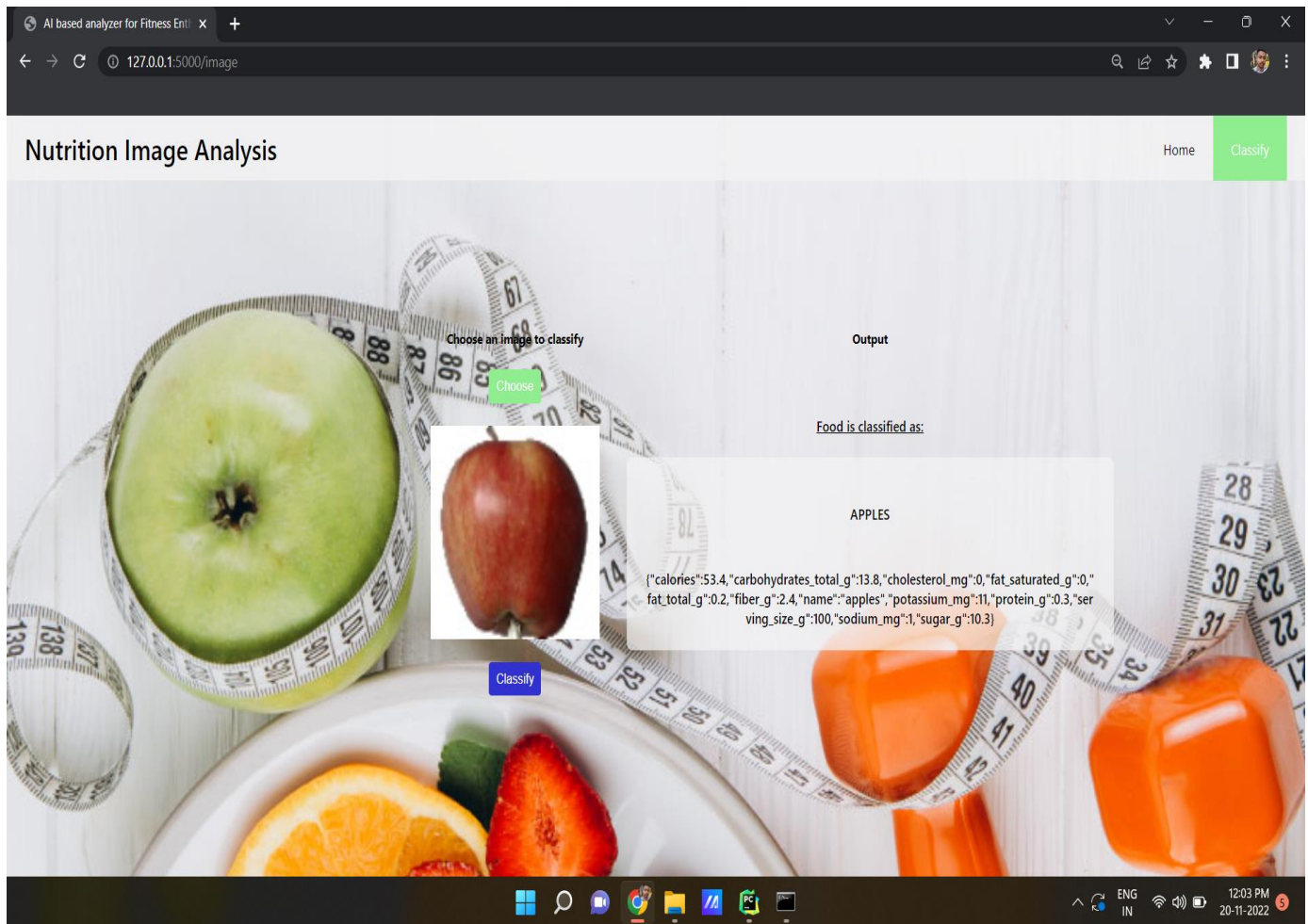
```
Anaconda Prompt (anaconda: X + - X)
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Retrieving notices: ...working... done

(base) C:\Users\Jasim>cd IBM\Project\AI-Powered Nutrition Analyser for Fitness Enthusiasts\Flask\uploads

(base) C:\Users\Jasim\IBM\Project\AI-Powered Nutrition Analyser for Fitness Enthusiasts\Flask\uploads>python app.py
2022-11-20 00:16:46.954488: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
(oneDNN) to use the following CPU instructions in performance-critical operations: AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2022-11-20 00:16:46.964481: I tensorflow/core/common_runtime/process_util.cc:146] Creating new thread pool with default inter op setting: 2. Tune using inte
r_op_parallelism_threads for best performance.
Loaded model from disk
* Serving Flask app "app" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
127.0.0.1 - - [20/Nov/2022 00:19:19] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:21] "GET /static/css/styles.css HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:21] "GET /static/images/img.jpg HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:21] "GET /favicon.ico HTTP/1.1" 404 -
127.0.0.1 - - [20/Nov/2022 00:19:49] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:54] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:56] "GET /image HTTP/1.1" 200 -
127.0.0.1 - - [20/Nov/2022 00:19:56] "GET /static/js/app.js HTTP/1.1" 200 -
```

Output:





10. ADVANTAGES & DISADVANTAGES

Advantages:

1. It can cause you to think about and consider a food choice before you take a bite.
2. It allows you to analyze your own food choices to assess and tweak your eating plan and patterns.
3. It provides general awareness of nutrients in food.
4. It is a targeted way to focus on your health.

Disadvantages:

1. It can actually remove a level of mindfulness because the goal is to hit target numbers NOT listen to your body.
2. It's not sustainable long term.
3. We might avoid certain healthy foods that are difficult to add into the food tracker

11. CONCLUSION

By the end of this project we will

- know fundamental concepts and techniques of Convolutional Neural Network.
- gain a broad understanding of image data
- know how to build a web application using the Flask framework.ow how to pre-process data and
- know how to clean the data using different data preprocessing techniques.

12.FUTURE SCOPE

- AI is revolutionizing the health industry.
- It is majorly used in improving marketing and sales decisions, AI is now also being used to reshape individual habits.
- In future we don't want to go to gym and do any diets. By using this nutrition fitness analyzer we can maintain our diet plans without any help from others and we can lead a happy and healthy life with good wealth.
- AI can easily track health behaviors and repetitive exercise patterns and use the data to guide you towards your fitness journey and diet plans .

13.APPENDIX

SOURCE CODE: LINK

https://drive.google.com/file/d/1ptPAAk09UKnMqhyXnGtbFjp6ejurjLu9/view?usp=share_link

GITHUB LINK:

<https://github.com/IBM-EPBL/IBM-Project-47847-1660802>