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.

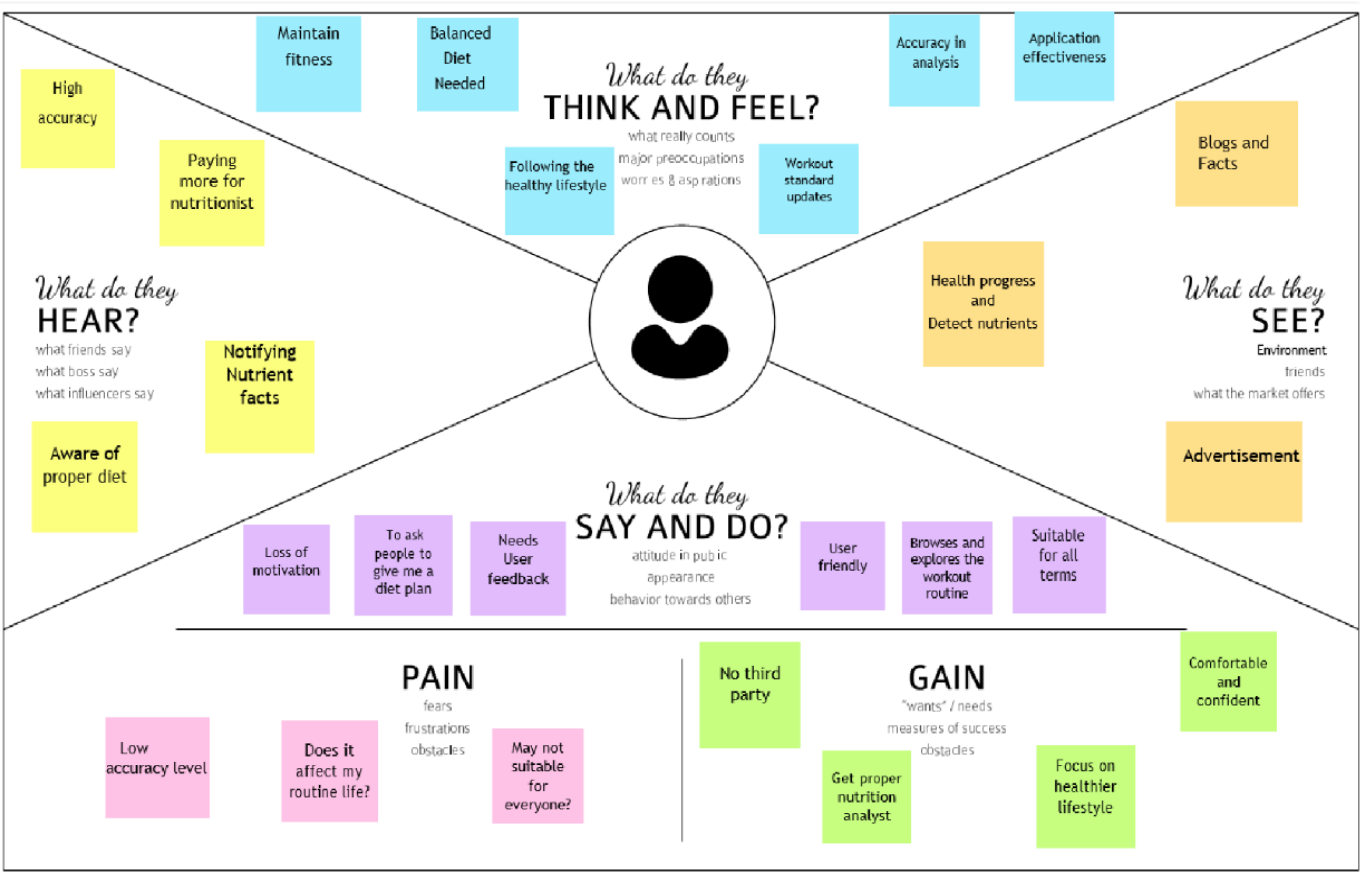
The application relies on Artificial Intelligence to produce custom data related to smart calorie counter powered by AI. Their artificial intelligence learns an individual's tastes, preferences, and body type. All of this is packaged in a comprehensive nutrition and activity tracker.

2.3 Problem Statement Definition

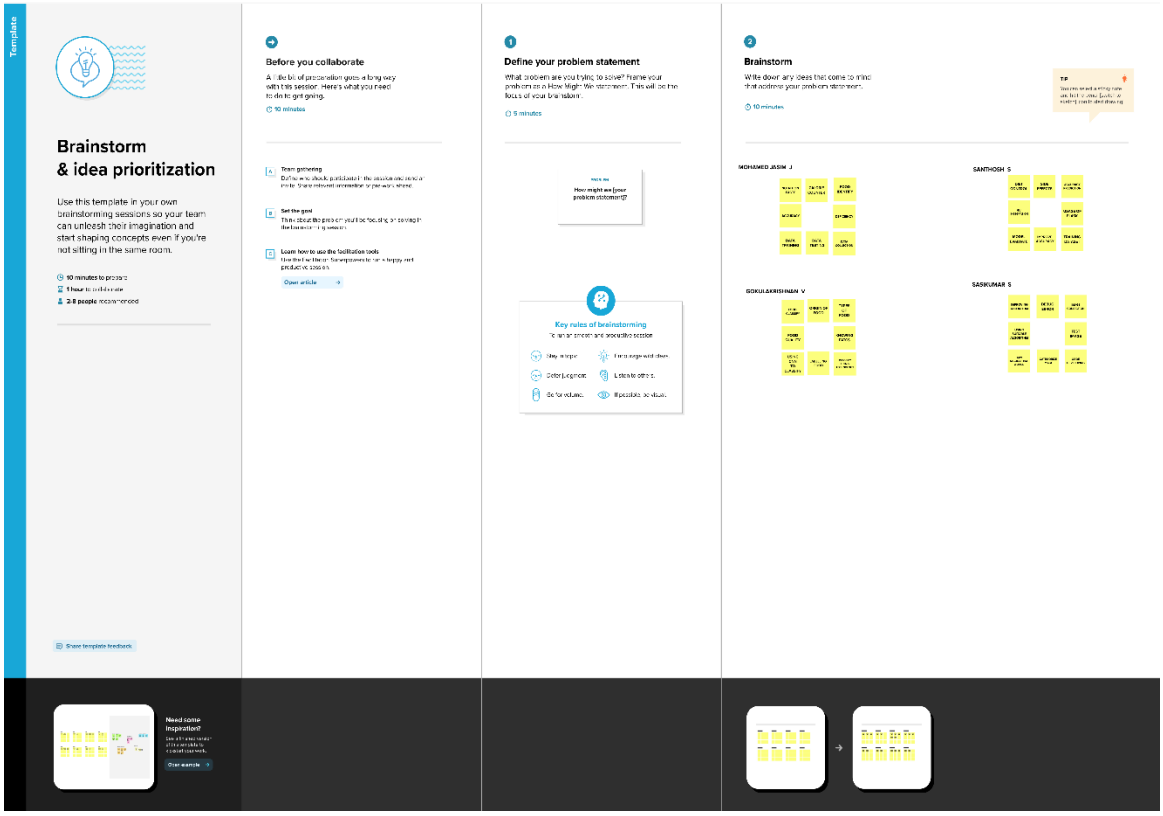
The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent the trained model. The model analyses the image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

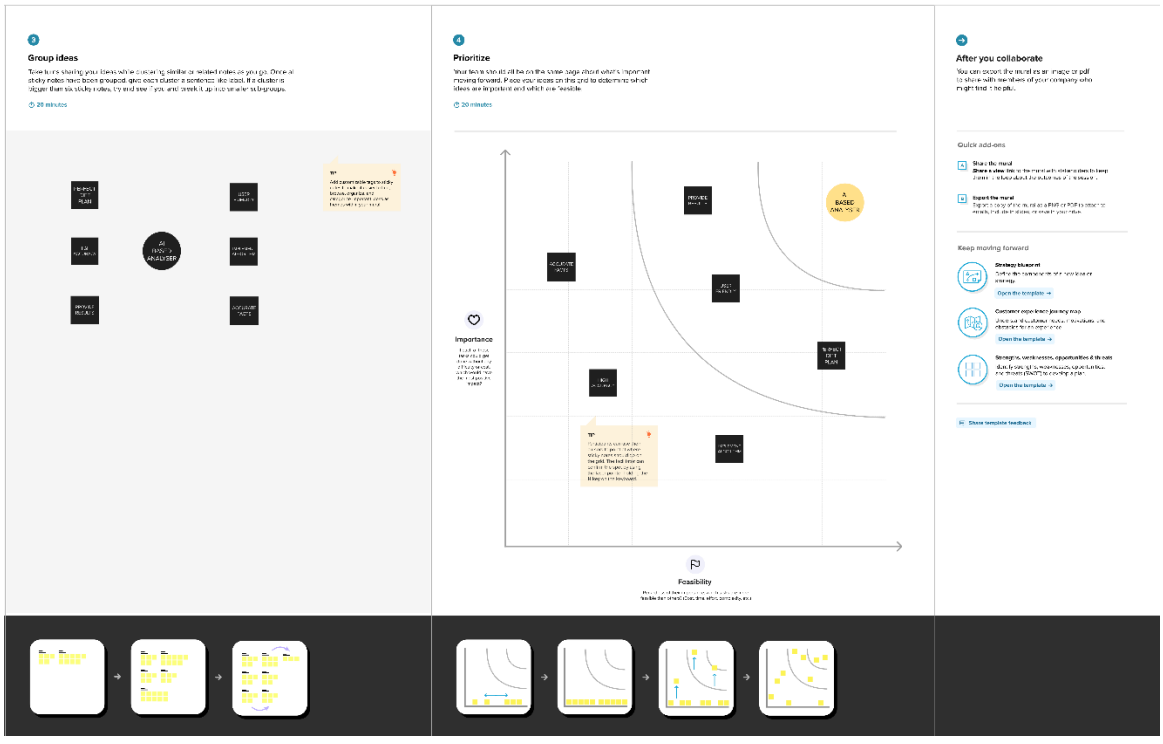
3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming





3.3 Proposed Solution

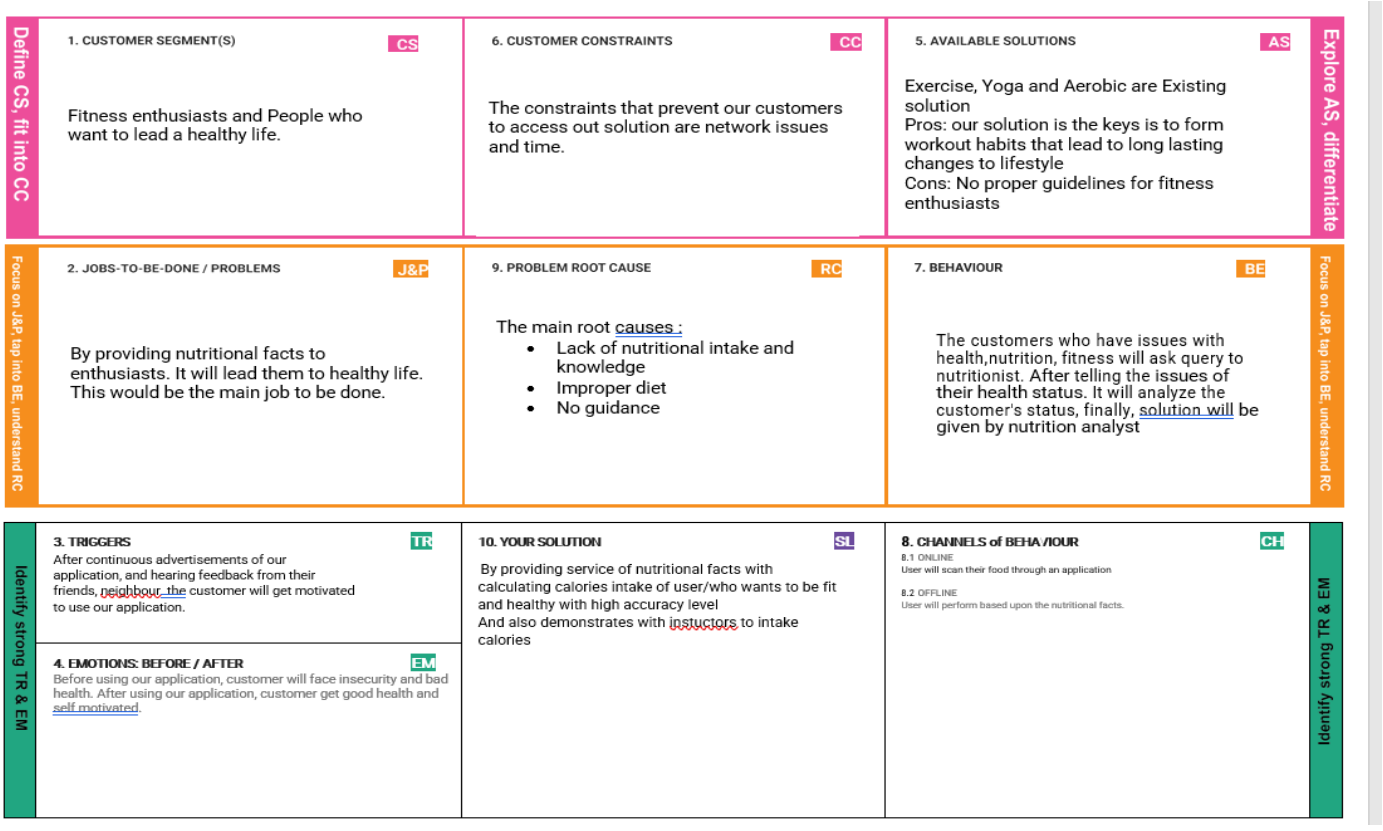
S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	A nutrition analyser with AI powered fruit classifier based on the features to provide nutritional values like sugar, protein, fibre, vitamins, minerals etc to Fitness Enthusiasts. The user must also be aware of the nutritional content
2.	Idea / Solution description	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 onthe obtained data
3.	Novelty / Uniqueness	1. CNN based fruit classifier that supports nutrition analyser that provides nutrition values of the fruit. 2. Availability of fitness plans with add-on bonuses 3. 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)	• Offering monthly/yearly subscription for premium features. • Consultation with nearest trainers andnutritionist for personalized plans.
6.	Scalability of the Solution	• Storage requirements of a specificfood. • 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.



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

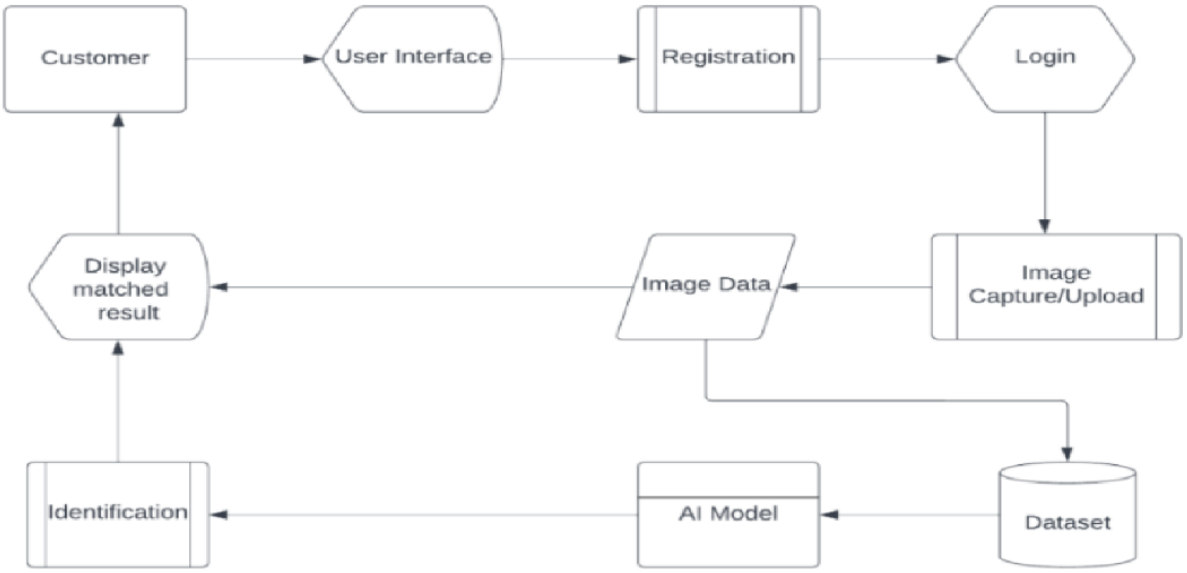
4.2 Non-functional Requirements:

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

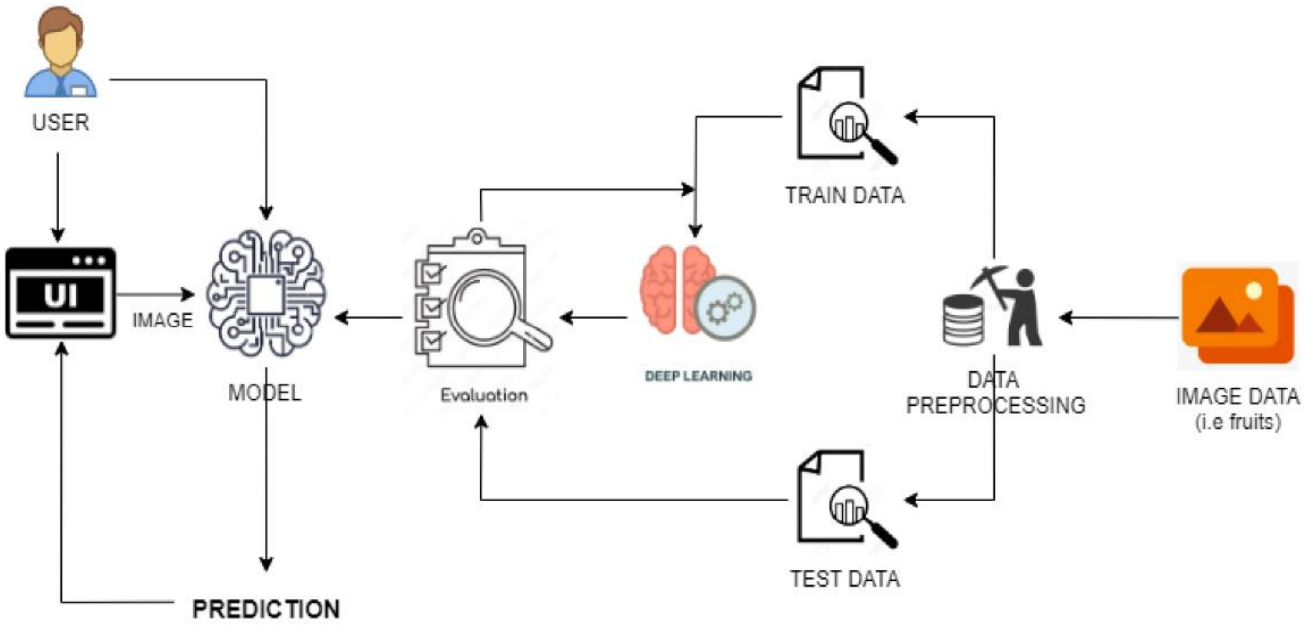
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	User friendly interface for using the application
NFR-2	**Security**	User's information are secured in server
NFR-3	**Reliability**	Authenticated user only can access the app
NFR-4	**Performance**	Better performance comparing to other 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 incase 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

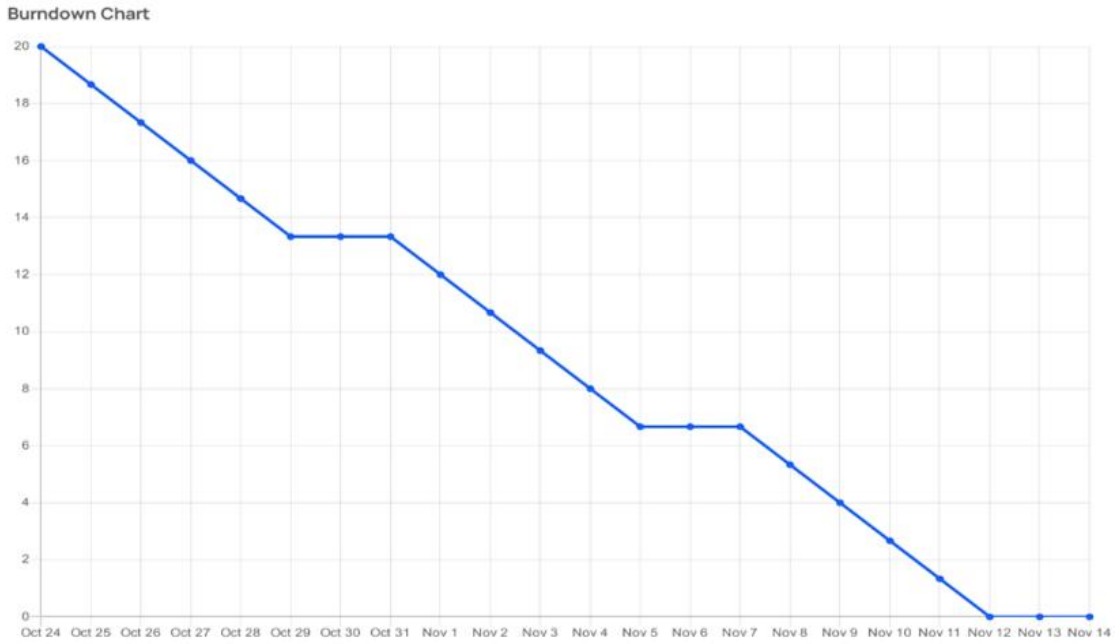
Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

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

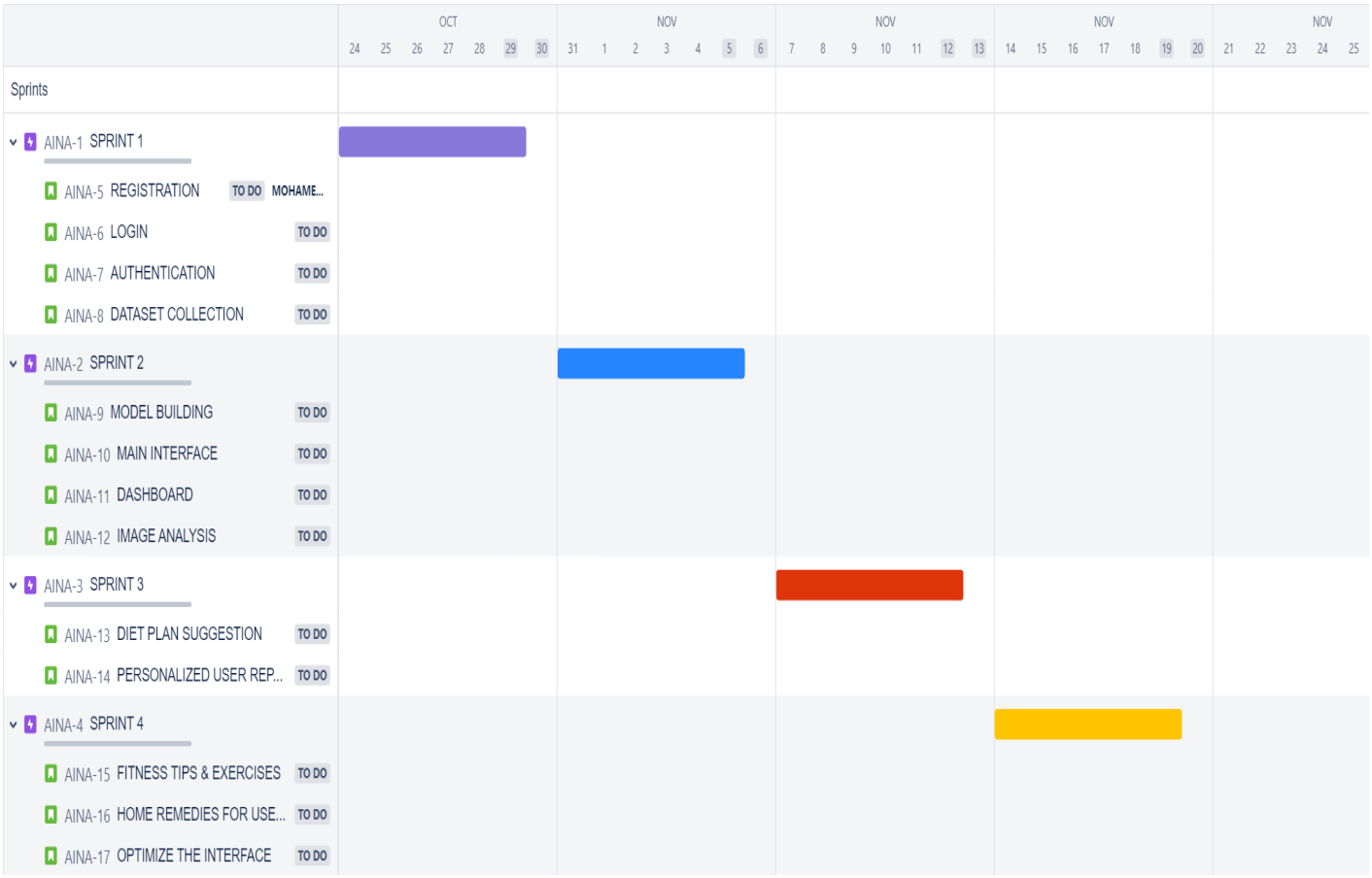
$$= 20/6$$

$$= 3.3$$

6.2 Sprint Delivery Schedule



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=20, 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. Pl

Epoch 1/20
494/824 [============>.............] - ETA: 6:52 - loss: 0.7194 - accuracy: 0.7174
```

7. Saving The Model

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

8. Testing The Model

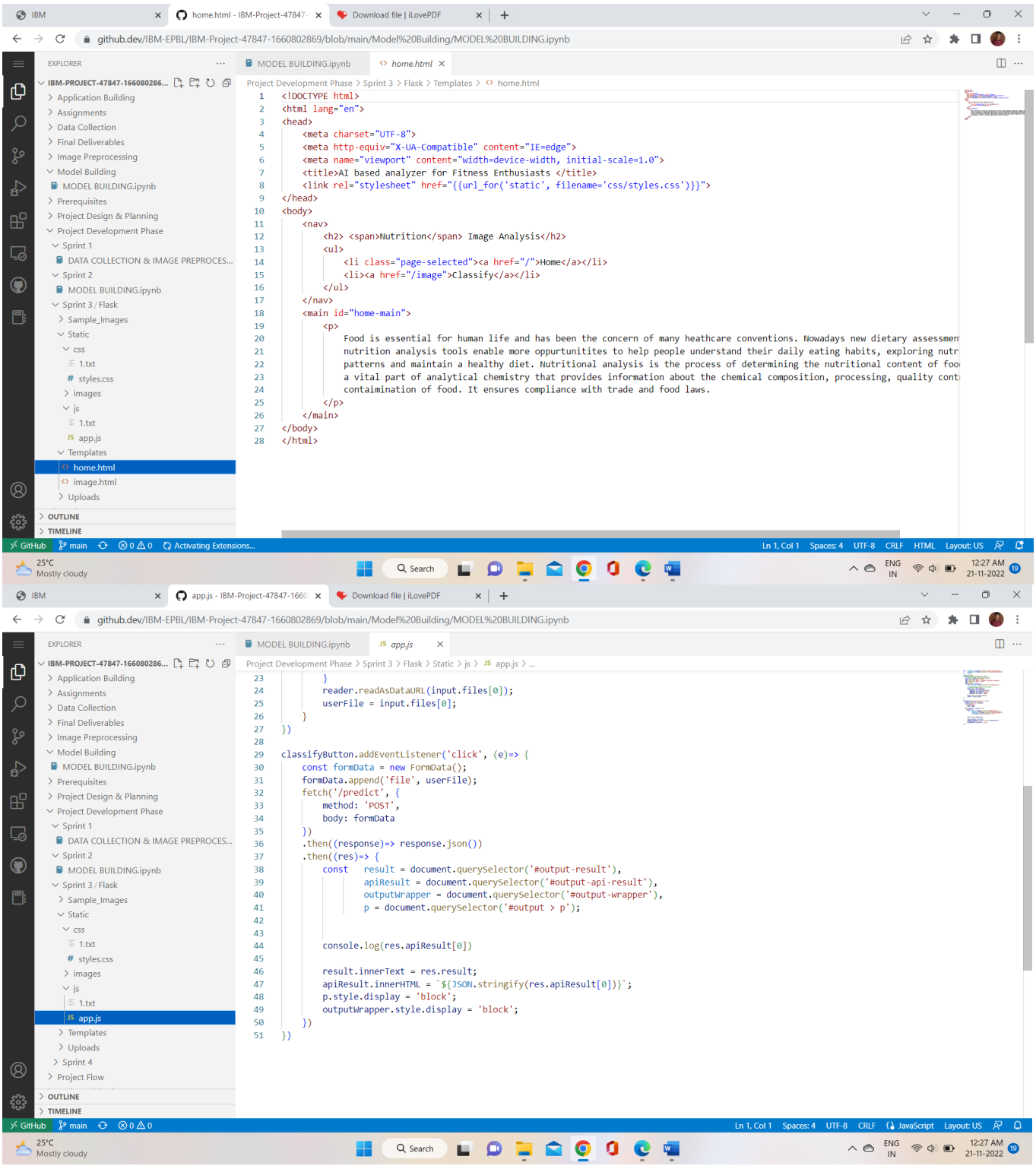
```
[ ]  from tensorflow.keras.models import load_model
     from keras.preprocessing import image
     model = load_model("nutrition.h5")
```

```
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

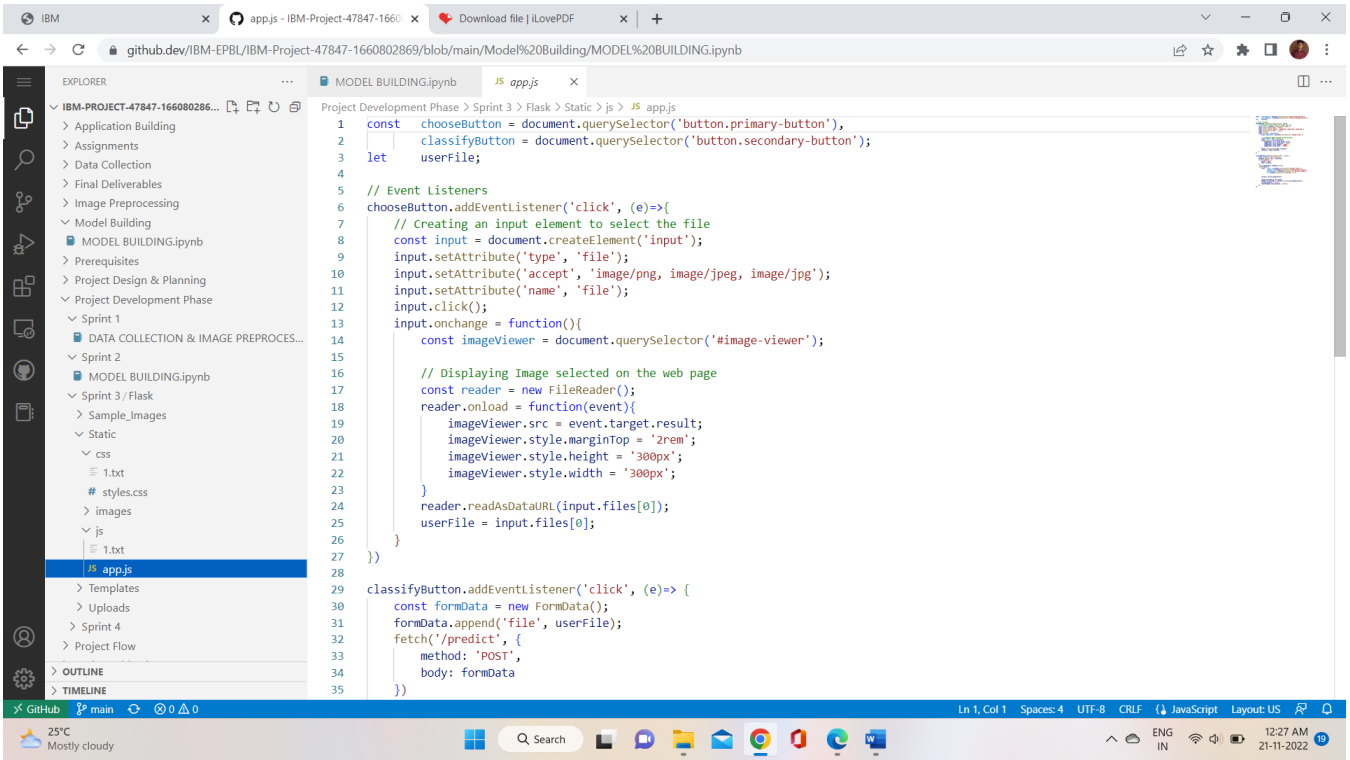

home.html - IBM-Project-47847-
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
home.html
Project Development Phase > Sprint 3 > Flask > Templates > home.html
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>AI based analyzer for Fitness Enthusiasts </title>
<link rel="stylesheet" href="{{url_for('static', filename='css/styles.css')}}">
</head>
<body>
<nav>
<h2> Nutrition Image Analysis</h2>

<li class="page-selected">Home
Classify

</nav>
<main id="home-main">

Food is essential for human life and has been the concern of many heathcare conventions. Nowadays new dietary assessmen
nutrition analysis tools enable more oppurtunitites to help people understand their daily eating habits, exploring nutr
patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of foo
a vital part of analytical chemistry that provides information about the chemical composition, processing, quality cont
contaimination of food. It ensures compliance with trade and food laws.

</main>
</body>
</html>
app.js - IBM-Project-47847-1660
app.js
Project Development Phase > Sprint 3 > Flask > Static > js > app.js > ...
}
reader.readAsDataURL(input.files[0]);
userFile = input.files[0];
}
})
classifyButton.addEventListener('click', (e)=> {
const formData = new FormData();
formData.append('file', userFile);
fetch('/predict', {
method: 'POST',
body: formData
})
.then((response)=> response.json())
.then((res)=> {
const result = document.querySelector('#output-result'),
apiResult = document.querySelector('#output-api-result'),
outputWrapper = document.querySelector('#output-wrapper'),
p = document.querySelector('#output > p');
console.log(res.apiResult[0])
result.innerText = res.result;
apiResult.innerHTML = `${JSON.stringify(res.apiResult[0])}`;
p.style.display = 'block';
outputWrapper.style.display = 'block';
})
})
25°C
Mostly cloudy
Search
12:27 AM
21-11-2022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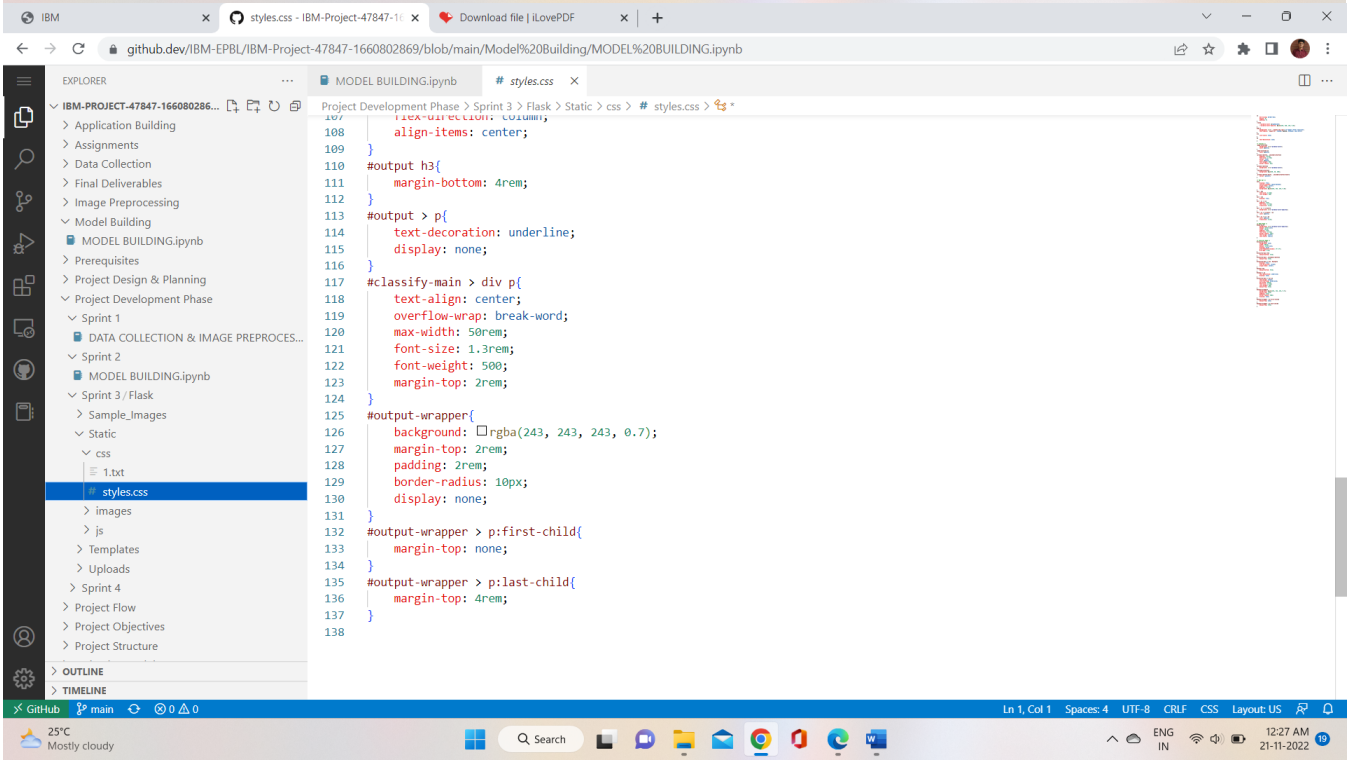
app.js - IBM-Project-47847-1660
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
app.js
Project Development Phase > Sprint 3 > Flask > Static > js > app.js
const chooseButton = document.querySelector('button.primary-button'),
classifyButton = document.querySelector('button.secondary-button');
let userFile;
// Event Listeners
chooseButton.addEventListener('click', (e)=>{
// Creating an input element to select the file
const input = document.createElement('input');
input.setAttribute('type', 'file');
input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
input.setAttribute('name', 'file');
input.click();
input.onchange = function(){
const imageViewer = document.querySelector('#image-viewer');
// Displaying Image selected on the web page
const reader = new FileReader();
reader.onload = function(event){
imageViewer.src = event.target.result;
imageViewer.style.marginTop = '2rem';
imageViewer.style.height = '300px';
imageViewer.style.width = '300px';
}
reader.readAsDataURL(input.files[0]);
userFile = input.files[0];
}
})
classifyButton.addEventListener('click', (e)=> {
const formData = new FormData();
formData.append('file', userFile);
fetch('/predict', {
method: 'POST',
body: formData
})
IBM-PROJECT-47847-166080286...
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
GitHub
main
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
JavaScript
Layout: US
25°C
Mostly cloudy
Search
ENG
IN
12:27 AM
21-11-2022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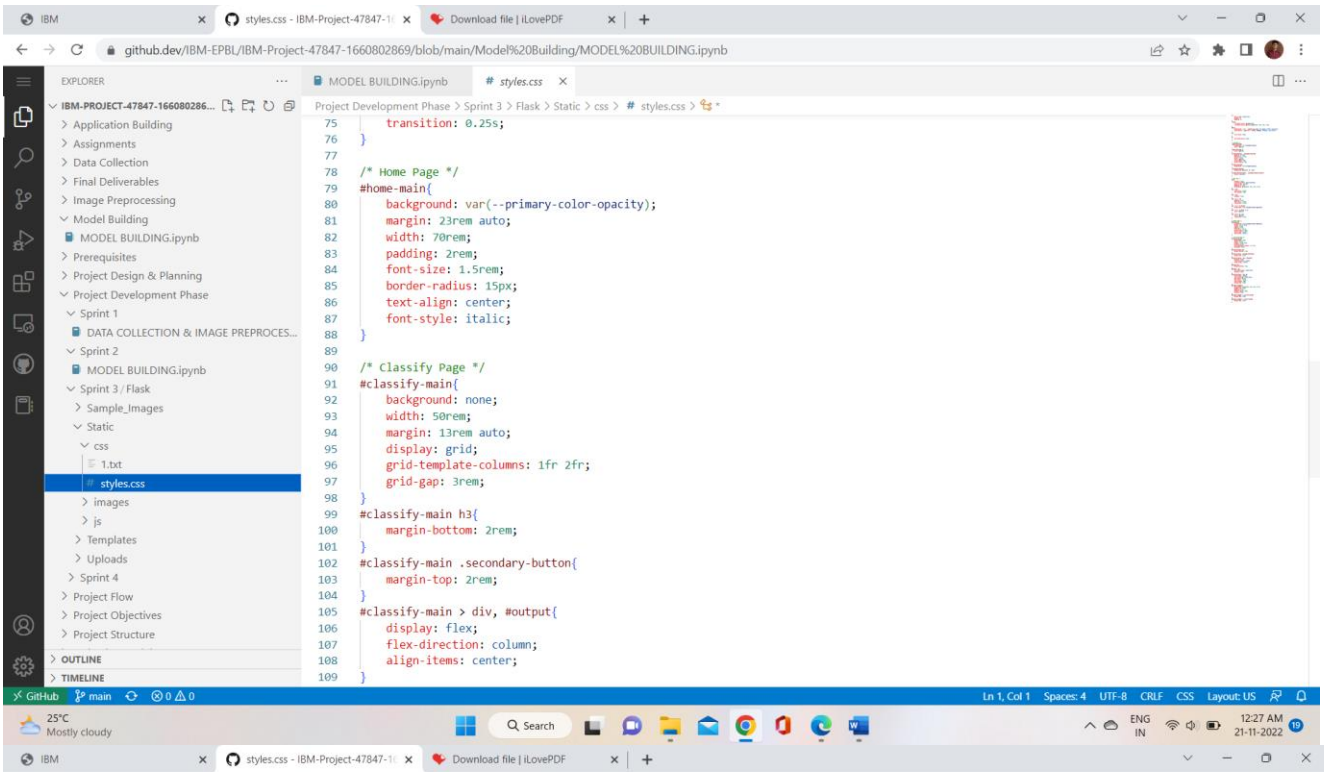
styles.css - IBM-Project-47847-1
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
styles.css
Project Development Phase > Sprint 3 > Flask > Static > css > styles.css
align-items: center;
}
#output h3{
margin-bottom: 4rem;
}
#output > p{
text-decoration: underline;
display: none;
}
#classify-main > div p{
text-align: center;
overflow-wrap: break-word;
max-width: 50rem;
font-size: 1.3rem;
font-weight: 500;
margin-top: 2rem;
}
#output-wrapper{
background: rgba(243, 243, 243, 0.7);
margin-top: 2rem;
padding: 2rem;
border-radius: 10px;
display: none;
}
#output-wrapper > p:first-child{
margin-top: none;
}
#output-wrapper > p:last-child{
margin-top: 4rem;
}
IBM-PROJECT-47847-166080286...
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
GitHub
main
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
CSS
Layout: US
25°C
Mostly cloudy
Search
ENG
IN
12:27 AM
21-11-2022


IBM
styles.css - IBM-Project-47847-1
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
styles.css
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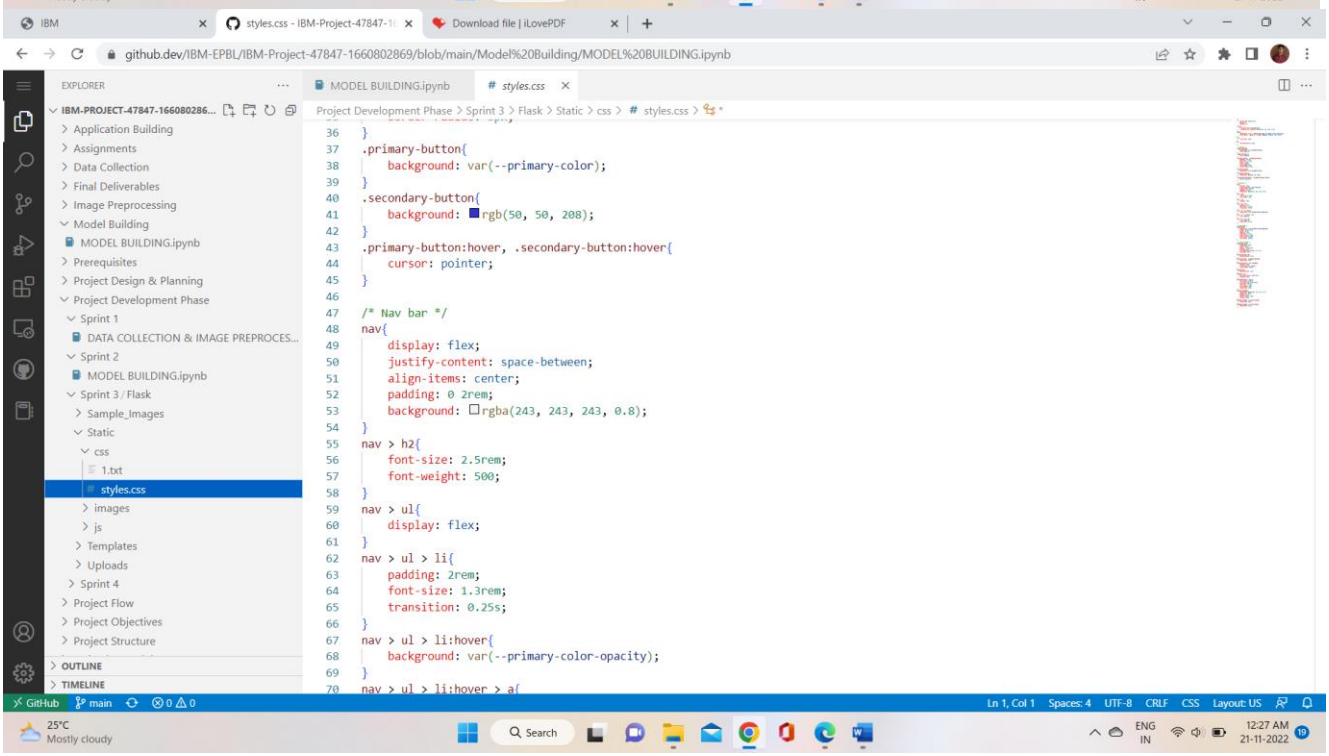
Project Design & Planning
Project Development Phase
Sprint 1
DATA COLLECTION & IMAGE PREPROCES...
Sprint 2
MODEL BUILDING.ipynb
Sprint 3 / Flask
Sample_Images
Static
css
1.txt
styles.css
images
js
Templates
Uploads
Sprint 4
Project Flow
Project Objectives
Project Structure
OUTLINE
TIMELINE
transition: 0.25s;
}
/* Home Page */
#home-main{
background: var(--primary-color-opacity);
margin: 23rem auto;
width: 70rem;
padding: 2rem;
font-size: 1.5rem;
border-radius: 15px;
text-align: center;
font-style: italic;
}
/* Classify Page */
#classify-main{
background: none;
width: 50rem;
margin: 13rem auto;
display: grid;
grid-template-columns: 1fr 2fr;
grid-gap: 3rem;
}
#classify-main h3{
margin-bottom: 2rem;
}
#classify-main .secondary-button{
margin-top: 2rem;
}
#classify-main > div, #output{
display: flex;
flex-direction: column;
align-items: center;
}
GitHub
main
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
CSS
Layout: US
25°C
Mostly cloudy
Search
ENG
IN
12:27 AM
21-11-2022


IBM
styles.css - IBM-Project-47847-1
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
styles.css
Project Development Phase > Sprint 3 > Flask > Static > css > styles.css
IBM-PROJECT-47847-166080286...
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images
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OUTLINE
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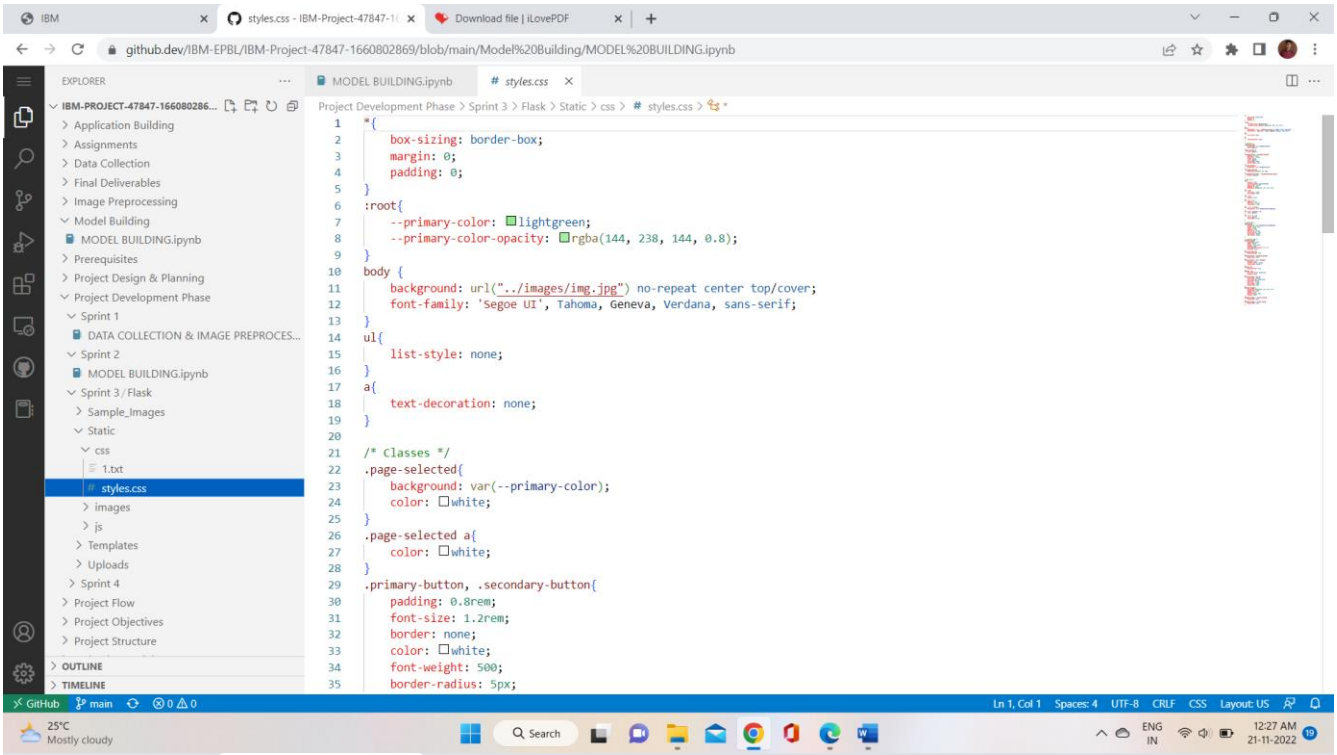
}
.primary-button{
background: var(--primary-color);
}
.secondary-button{
background: rgb(50, 50, 208);
}
.primary-button:hover, .secondary-button:hover{
cursor: pointer;
}
/* Nav bar */
nav{
display: flex;
justify-content: space-between;
align-items: center;
padding: 0 2rem;
background: rgba(243, 243, 243, 0.8);
}
nav > h2{
font-size: 2.5rem;
font-weight: 500;
}
nav > ul{
display: flex;
}
nav > ul > li{
padding: 2rem;
font-size: 1.3rem;
transition: 0.25s;
}
nav > ul > li:hover{
background: var(--primary-color-opacity);
}
nav > ul > li:hover > a{
GitHub
main
Ln 1, Col 1
Spaces: 4
UTF-8
CRLF
CSS
Layout: US
25°C
Mostly cloudy
Search
ENG
IN
12:27 AM
21-11-2022


IBM
styles.css - IBM-Project-47847-1
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
styles.css
Project Development Phase > Sprint 3 > Flask > Static > css > # styles.css
*{
box-sizing: border-box;
margin: 0;
padding: 0;
}
:root{
--primary-color: lightgreen;
--primary-color-opacity: rgba(144, 238, 144, 0.8);
}
body {
background: url("../images/img.jpg") no-repeat center top/cover;
font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
}
ul{
list-style: none;
}
a{
text-decoration: none;
}
/* Classes */
.page-selected{
background: var(--primary-color);
color: white;
}
.page-selected a{
color: white;
}
.primary-button, .secondary-button{
padding: 0.8rem;
font-size: 1.2rem;
border: none;
color: white;
font-weight: 500;
border-radius: 5px;
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Spaces: 4
UTF-8
CRLF
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Layout: US
25°C
Mostly cloudy
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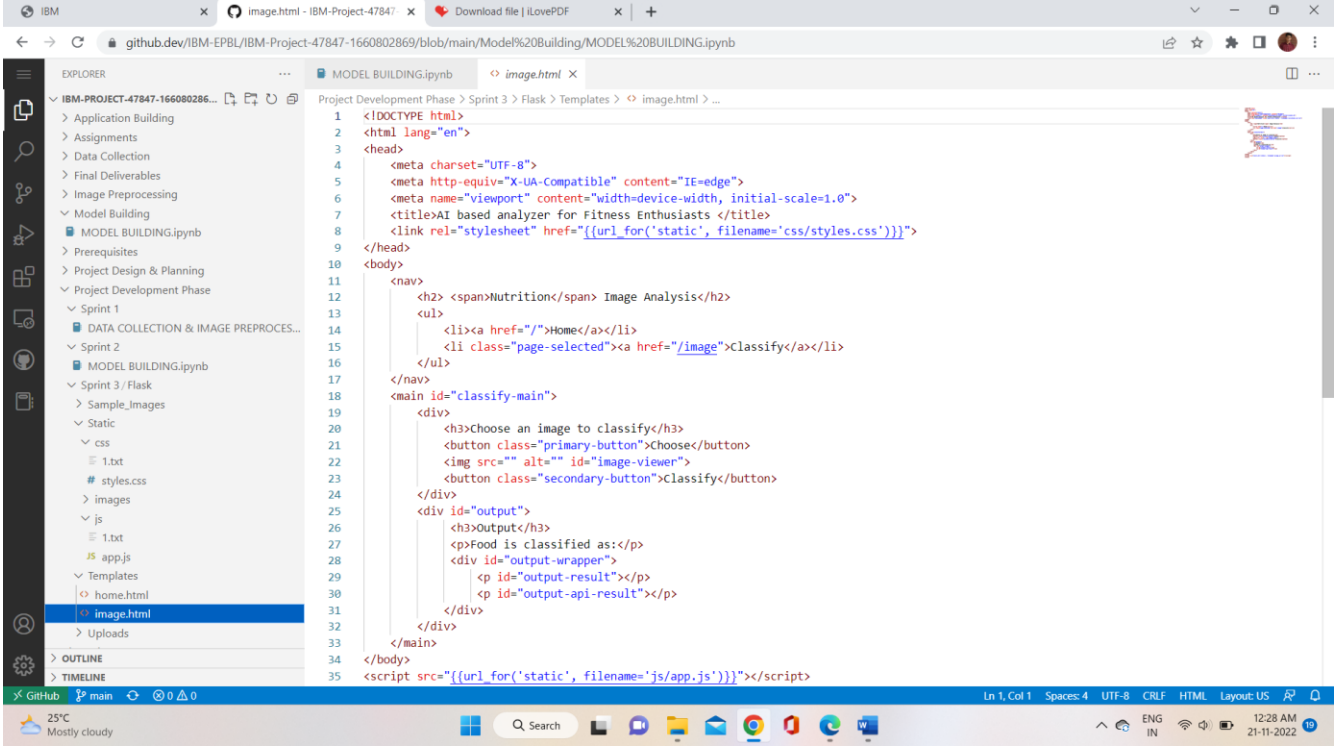
12:27 AM
21-11-2022


IBM
image.html - IBM-Project-47847
Download file | iLovePDF
github.dev/IBM-EPBL/IBM-Project-47847-1660802869/blob/main/Model%20Building/MODEL%20BUILDING.ipynb
EXPLORER
MODEL BUILDING.ipynb
image.html
Project Development Phase > Sprint 3 > Flask > Templates > image.html > ...
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>AI based analyzer for Fitness Enthusiasts </title>
<link rel="stylesheet" href="{{url_for('static', filename='css/styles.css')}}">
</head>
<body>
<nav>
<h2> Nutrition Image Analysis</h2>

Home
<li class="page-selected">Classify

</nav>
<main id="classify-main">

<h3>Choose an image to classify</h3>
<button class="primary-button">Choose</button>
<img src="" alt="" id="image-viewer">
<button class="secondary-button">Classify</button>

<h3>Output</h3>
Food is classified as:

</main>
</body>
<script src="{{url_for('static', filename='js/app.js')}}"></script>
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Search
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12:28 AM
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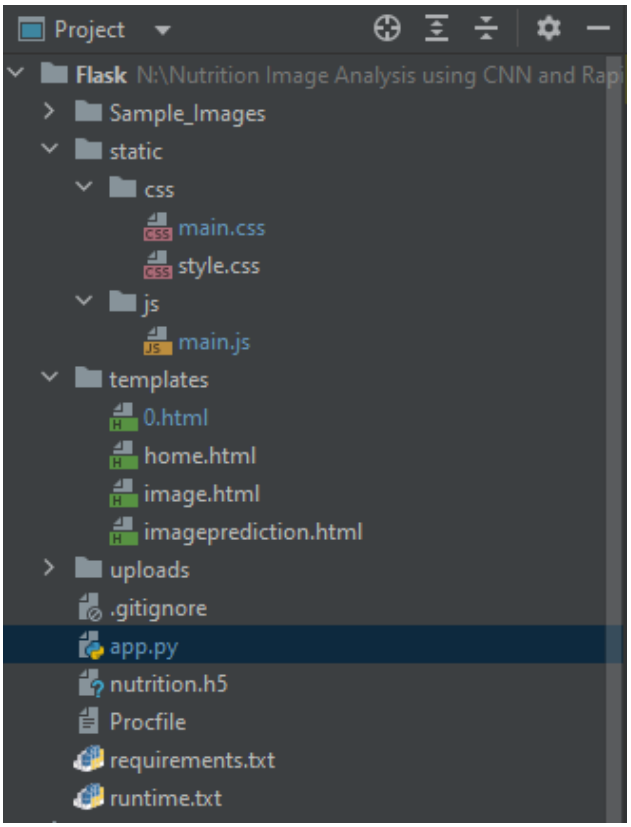
8.TESTING

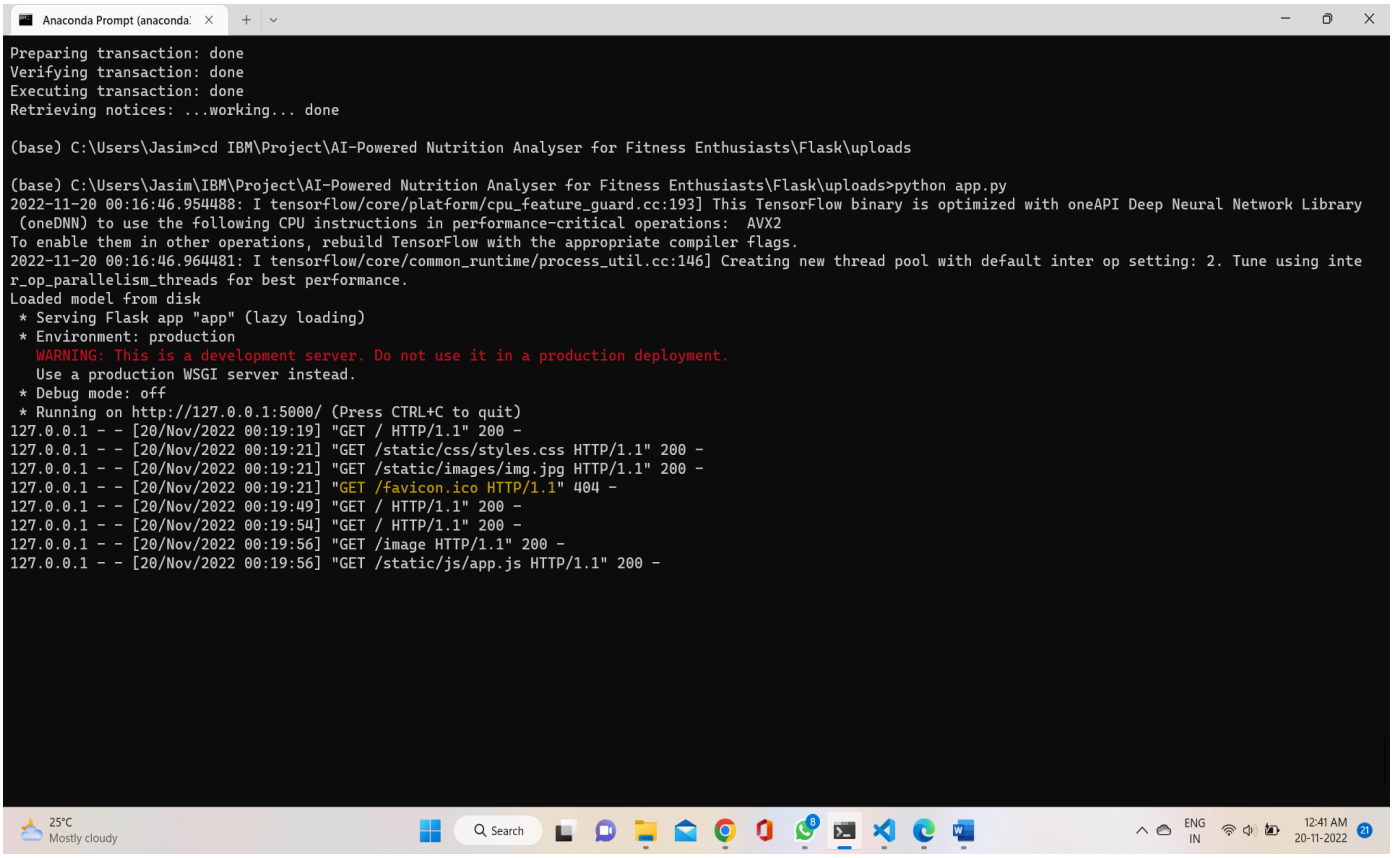
8.1 Test Cases



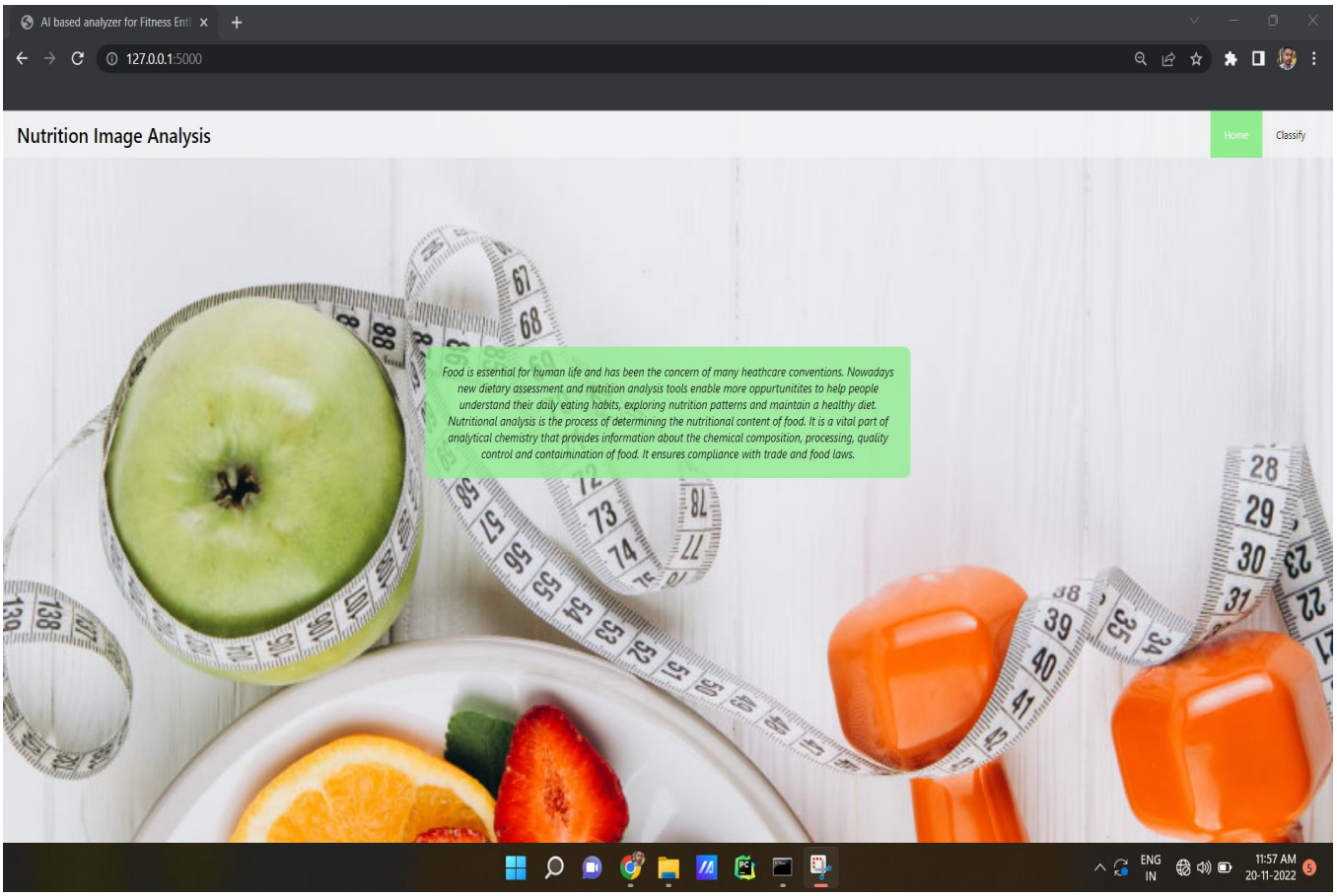
8.2 User Acceptance Testing

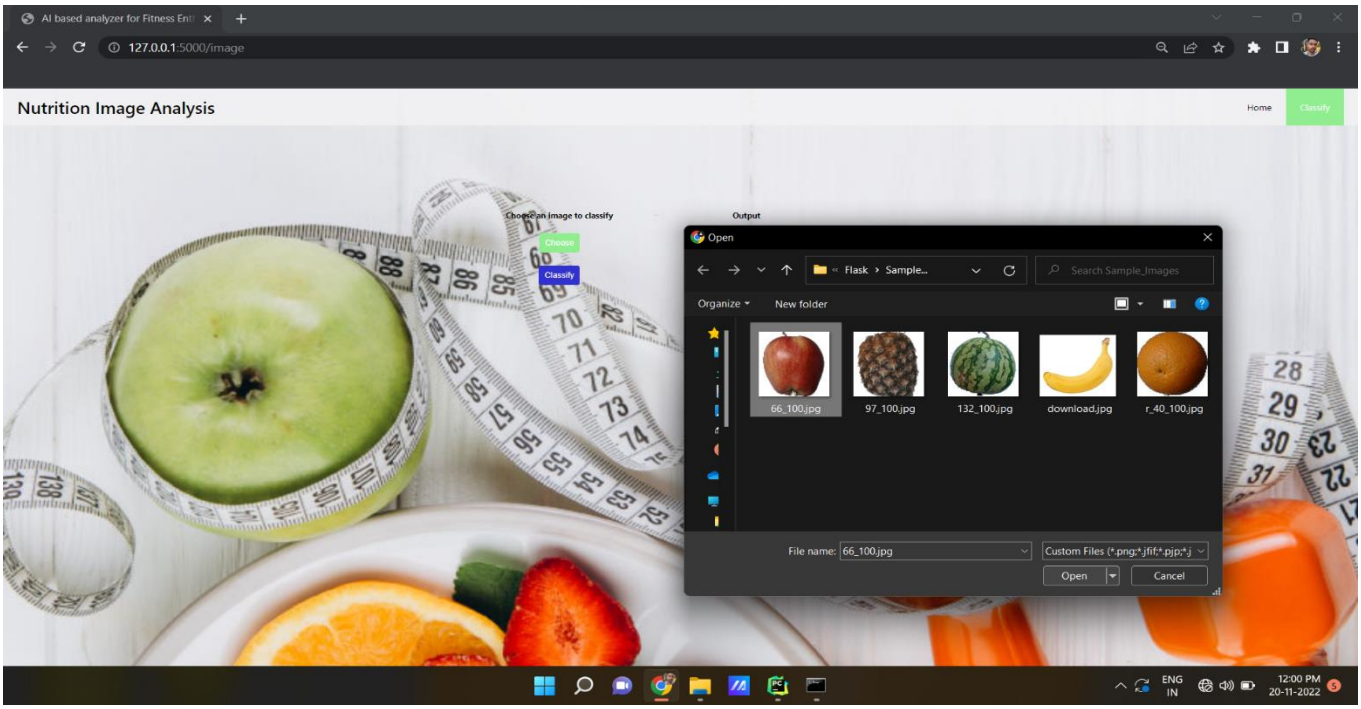
9.RESULTS

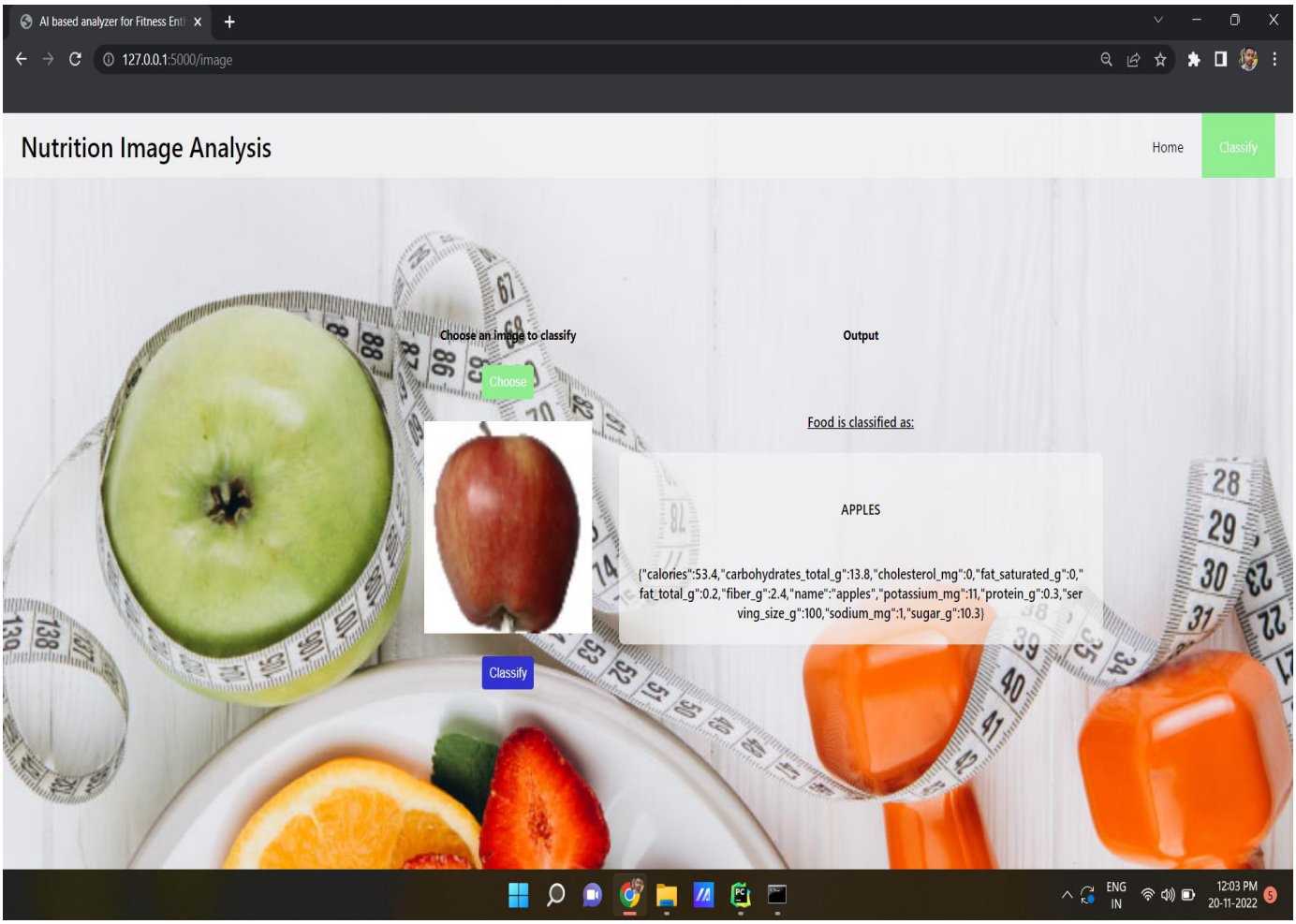
9.1 Performance Metrics



Output:


AI based analyzer for Fitness Ent
127.0.0.1:5000
Nutrition Image Analysis
Home
Classify
Food is essential for human life and has been the concern of many heathcare conventions. Nowadays new dietary assessment and nutrition analysis tools enable more oppurtunitites 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 contaimination of food. It ensures compliance with trade and food laws.
ENG
IN
11:57 AM
20-11-2022


AI based analyzer for Fitness Ent
127.0.0.1:5000/image
Nutrition Image Analysis
Home
Classify
Choose an image to classify
Choose
Classify
Output
Open
Flask › Sample...
Search Sample_Images
Organize
New folder
66_100.jpg
97_100.jpg
132_100.jpg
download.jpg
r_40_100.jpg
File name: 66_100.jpg
Custom Files (*.png;*.jfif;*.pjp;*.j
Open
Cancel
ENG
IN
12:00 PM
20-11-2022



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