# AI – POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

# PROJECT REPORT


**Submitted By:**

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# INTRODUCTION

A new food photo app that recognises your food instantly and simplifies calorie counting. “Scan my nutria” allows you to easily log your food by tapping to take a photo, we do some magic, and you simply swipe the food to confirm. That’s it; our app can recognise over one hundred thousand foods and packages. and it can detect a variety of global foods. the more accurate it gets. Get started with this free app now.

## PROJECT OVERVIEW:

As scan everyone can use my nutria, which aids Food adviser. To unlock exclusive access to our team of dieticians, diet plans, and recipes, subscribe to the premium version. To begin, scan the food with the camera. The app will recognise the food you scan with the cameras and provide information about it such as its fat, protein, carbohydrate, vitamin, fiber, and calorie content. and its food API utilises highly trained models that are not only able to recognise a variety of dishes but have the granularity to differentiate between different presentation styles, preparation methods, and regional variations.

## PURPOSE:

The Main motive of this project is scan my nutrition makes instant nutrition and calorie estimates from your meals ,just snap the food photo and scan my nutria let do the rest the app uses computer vision.

# LITERATURE SURVEY

## EXISTING PROBLEM:

While the accuracy is not 100 percentage, it’s a funny way to use photos to effortlessly track calories and basic daily food intake. As with similar apps, those that focus on food tracking and calorie counting are not for everyone and should be used with the guidance of a healthcare professional. It has many drawbacks, such as errors during scanning and suggesting wrong details.

## REFERENCES:


- Boje O: Arbeitshypoglykämie nach Glucose Eingabe. Skand Arch Physiol 1940; 83: 308–312.
- Ahlborg G, Felig P: Substrate utilization during prolonged exercise preceded by ingestion of glucose. Am J Physiol 1977; 233:E188–E194.
- Costill DL, Coyle E, Dalsky G, Evans W, Fink W, Hoopes D: Effects of elevated plasma FFA and insulin on muscle glycogen usage during exercise. J Appl Physiol 1977; 43: 695–699

- Foster C, Costill DL, Fink WJ: Effects of preexercise feedings on endurance performance.

## PROBLEM STATEMENT DEFENITION:

People all over the world are becoming more health conscious, eating more nutritious foods and avoiding junk food; therefore, a system that can measure calories and nutrition in everyday meals can be very beneficial to one's health. Food calorie and nutrition measurement systems are very beneficial for dieticians and patients to measure and manage their daily food intake. This application consists of the user interface, which will be publicly displayed on the application.

# IDEATION AND PROPOSED SOLUTION

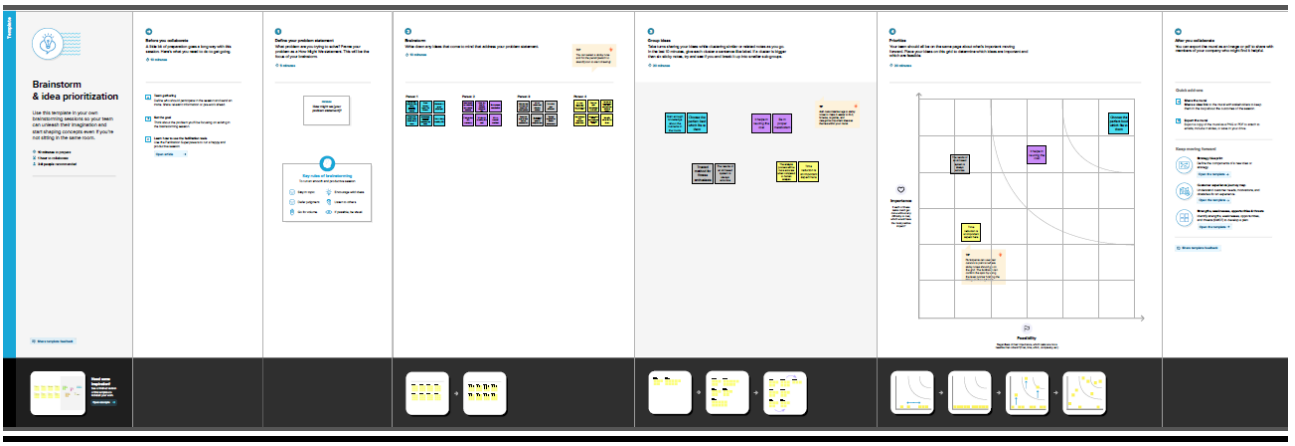
## EMPATHY MAP CANVAS:

An empathy map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment.


What do they
THINK AND FEEL?
what really counts
major preoccupations
worries & aspirations
It maintains the muscle
Convenient way for fitness
Nutrition is imprtant
Perfect body shape
Integrated in our daily life
Quality skin tone
What do they
HEAR?
what friends say
what boss say
what influencers say
So obsessed with junk food
Health is very important
Many ways to maintain fitness
Trendy ways for nutrition
A new method for nutrient maintainance
Easy way to gain nutrition from home
What do they
SEE?
environment
friends
what the market offers
What do they
SAY AND DO?
attitude in public
appearance
behavior towards others
Looking for food that matches interest
Need to know the nutrients in each food
Need a scheduled diet
It should br user friendly
Easier to use
Something reliable is needed
PAIN
fears
frustrations
obstacles
Following regular diet may not be possible
Some items are costly
Maintaining correct order of nutrient foods
GAIN
"wants" / needs
measures of success
obstacles
High nutrient value can be gained
The person can become more active
Gain energy and Confidence

# IDEATION AND BRAINSTORMING

It consists of all the ideas of instruments and equipments that we are going to implement in this project.



# PROPOSED SOLUTION:

| S.No. | Parameter | Description |
|---|---|---|
| 1. | Problem Statement (Problem to be solved) | 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. |
| 2. | Idea / Solution description | Brand-new fruit classifcation method called HPA-SLFN can be implemented for classifcation as it gives better results when compared to other techniques |
| 3. | Novelty / Uniqueness | The models performance and accuracy for the analyses of image and detection rate of the nutrition based on the fruits is higher. |
| 4. | Social Impact / Customer Satisfaction | 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.). |

| | | |
|---|---|---|
| 5. | Business Model (Revenue Model) | ● Data analytics<br>● Statistics<br>● Future prediction |
| 6. | Scalability of the Solution | The model is scalable from the architecture and dataset training perspective. We can train huge amounts of image data by converting them into .npy / .npz file format which would facilitate easy storing, retrieving and processing. |

## 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 behavioural patterns and recognize what would work and why.


# REQUIREMENT ANALYSIS

## FUNCTIONAL REQUIREMENTS:

### Upload Image:

In this module, upload the nutrition datasets in the form of CSV file format. In addition, the data is saved in a database for future use. Fruits and vegetables calorie, protein, fat, carbohydrate, vitamin, and cholesterol values are included in the dataset. These values are taken from the Kaggle website and saved as integer values.

### Filtering Noise:

Filter techniques are used to remove noise in images in order to evaluate nutrients based on the fruits or

vegetables. The filter's objective is to remove noise from photos. It is supported by a statistical methodology. The usual frequency response of a filter is built. Filtering is a nonlinear image processing technique used to minimise "salt and pepper" noise. When edge preservation and noise reduction are concerns, a median filter is superior to convolution.

Classification:

The food image uploaded from the user end will be compared with the food items in the system database for the features obtained in the feature extraction step. The specific food item will be recognised when the perfect match is obtained based on the attributes matched. The name of the detected food item and the nutrition details will be displayed over the food.

Nutrition Detection:

The request for an insurance claim can be viewed and approved by the insurance company. Once the damaged image has been uploaded and the degree of the damage has been determined, the user may receive insurance only if the firm accepts the damaged image and the condition is greater than 80%.13

Non - Functional Requirements:

Usability :

The system shall allow the users to access the system with pc using web application. The system uses a

web application as an interface. The system is user friendly which makes the system easy

Availability :

The system is available 100% for the user and is used 24 hrs a day and 365 days a year. The system shall be operational 24 hours a day and 7 days a week.

Scalability:

Scalability is the measure of a system's ability to increase or decrease in performance and cost in response to changes in application and system processing demands.

Security:

A security requirement is a statement of needed security functionality that ensures one of many different security properties of software is being satisfied.

Performance :

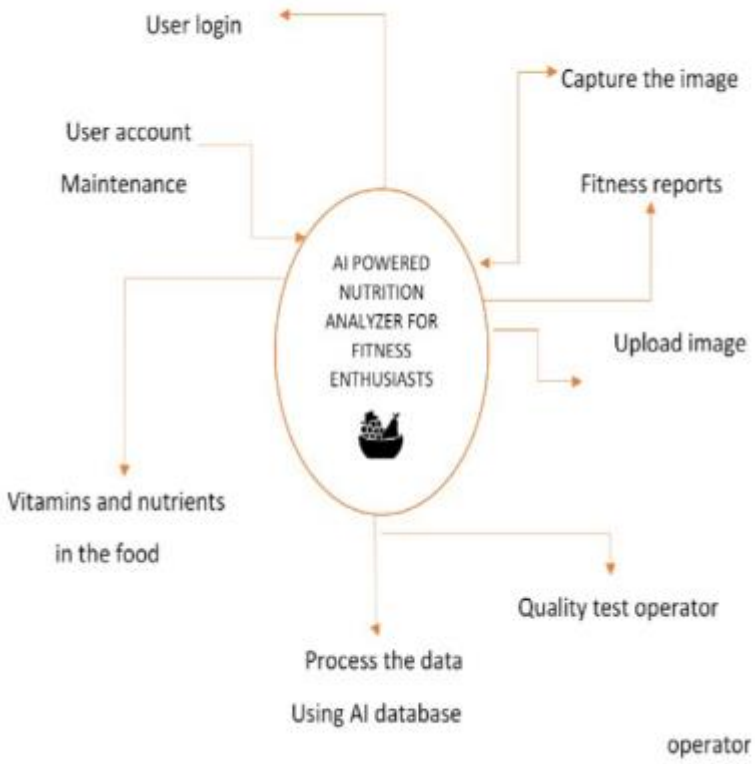
The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen.

Reliability :

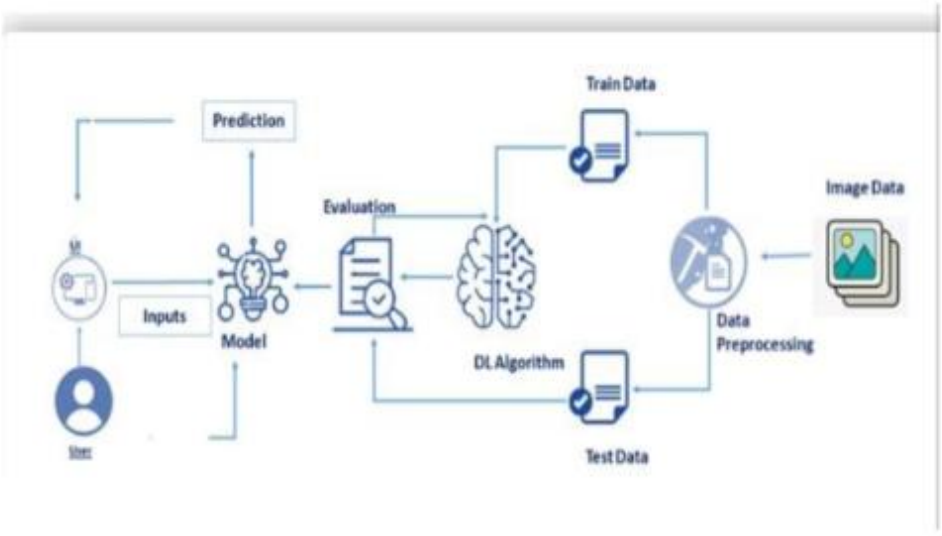
The system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week. 24 hours a day.

# PROJECT DESIGN

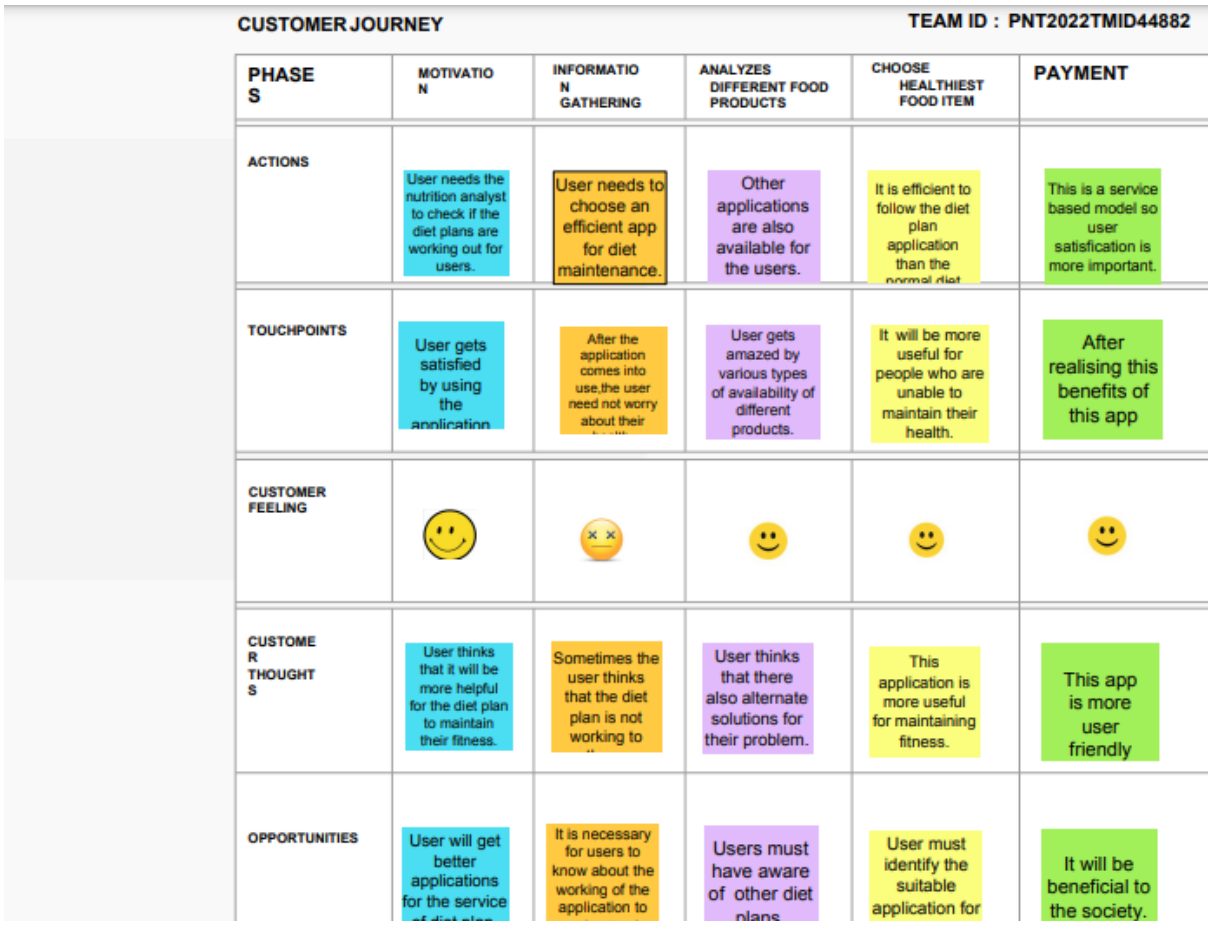
## DATA FLOW DIAGRAM:



# SOLUTION AND TECHNICAL ARCHITECTURE:



# CUSTOMER JOURNEY:



**CUSTOMER JOURNEY** — **TEAM ID : PNT2022TMID44882**

| PHASES | MOTIVATION | INFORMATION GATHERING | ANALYZES DIFFERENT FOOD PRODUCTS | CHOOSE HEALTHIEST FOOD ITEM | PAYMENT |
|---|---|---|---|---|---|
| ACTIONS | User needs the nutrition analyst to check if the diet plans are working out for users. | User needs to choose an efficient app for diet maintenance. | Other applications are also available for the users. | It is efficient to follow the diet plan application than the normal diet | This is a service based model so user satisfication is more important. |
| TOUCHPOINTS | User gets satisfied by using the application | After the application comes into use,the user need not worry about their | User gets amazed by various types of availability of different products. | It will be more useful for people who are unable to maintain their health. | After realising this benefits of this app |
| CUSTOMER FEELING | | | | | |
| CUSTOMER THOUGHTS | User thinks that it will be more helpful for the diet plan to maintain their fitness. | Sometimes the user thinks that the diet plan is not working to | User thinks that there also alternate solutions for their problem. | This application is more useful for maintaining fitness. | This app is more user friendly |
| OPPORTUNITIES | User will get better applications for the service | It is necessary for users to know about the working of the application to | Users must have aware of other diet plans | User must identify the suitable application for | It will be beneficial to the society. |

# PROJECT PLANNING AND SCHEDULING

## SPRINT PLANNING AND ESTIMATION:

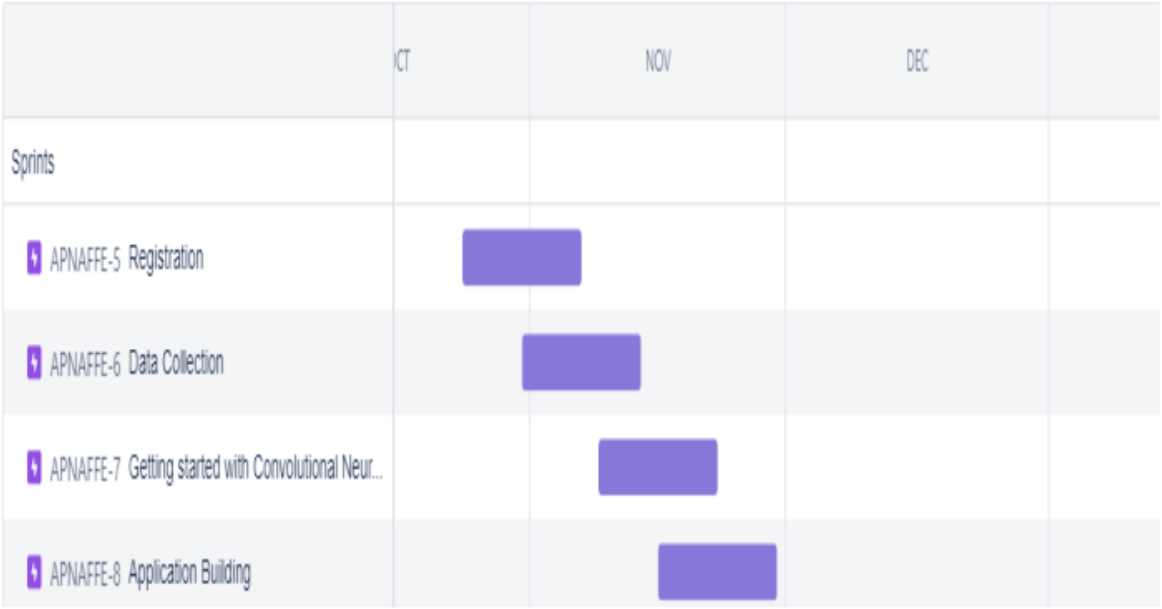
| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-1 | Data Collection | USN-1 | Download Food Nutrition Dataset | 4 | High | ABHISHEAK |
| Sprint-1 | Data Preprocessing | USN-2 | Importing The Dataset into Workspace | 1 | Low | VARUN KAILASH |
| Sprint-1 | | USN-3 | Handling Missing Data | 3 | Medium | LOGU |
| Sprint-1 | | USN-4 | Feature Scaling | 3 | Low | SATHISH |
| Sprint-1 | | USN-5 | Data Visualization | 4 | High | ABHISHEAK LOGU |
| Sprint-1 | | USN-6 | Spitting the Data into the Train and Test | 4 | Medium | SATHISH VARUN KAILASH |
| Sprint-1 | | USN-7 | Creating A Dataset with Sliding Windows | 4 | Medium | ABHISHEAK SATHISH |
| Sprint-2 | Model Building | USN-8 | Importing The Model Building Libraries | 1 | Medium | ABHISHEAK VARUN KAILASH |
| Sprint-2 | | USN-9 | Initializing The Model | 3 | High | ABHISHEAK |
| Sprint-2 | | USN-10 | Adding LSTM Layers | 2 | Medium | VARUN KAILASH |
| Sprint-2 | | USN-11 | Adding Output Layers | 3 | High | LOGU |

| Sprint | Functional Requirement (Epic) | User Story Number | User Story / Task | Story Points | Priority | Team Members |
|---|---|---|---|---|---|---|
| Sprint-2 | | USN-12 | Configure The Learning Process | 2 | Low | SATHISH |
| Sprint-2 | | USN-13 | Train The Model | 2 | Medium | LOGU VARUN KAILASH |
| Sprint-2 | | USN-14 | Model Evaluation | 1 | Medium | SATHISH LOGU |
| Sprint-2 | | USN-15 | Save The Model | 2 | Medium | ABHISHEAK LOGU |
| Sprint-2 | | USN-16 | Test The Model | 3 | High | LOGU VARUN KAILASH |
| Sprint-3 | Application Building | USN-17 | Create An HTML File | 4 | Medium | SATHISH VARUN KAILASH |
| Sprint-3 | | USN-18 | Build Python Code | 4 | High | VARUN KAILASH SATHISH |
| Sprint-3 | | USN-19 | Creating our Flask application and loading our model by using load_model method | 4 | Medium | ABHISHEAK SATHISH |
| Sprint-3 | | USN-20 | Routing to HTML page | 4 | High | ABHISHEAK VARUN KAILASH |
| Sprint-3 | | USN-21 | Run the application | 2 | Medium | LOGU |
| Sprint-4 | Train The Model On IBM | USN-21 | Register For IBM Cloud | 4 | Medium | SATHISH |
| Sprint-4 | | USN-22 | Train The ML Model On IBM | 8 | High | VARUN KAILASH |
| Sprint-4 | | USN-23 | Integrate Flask with Scoring End Point | 8 | High | ABHISHEAK |

## 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 | 2 Nov 2022 |
| Sprint-2 | 20 | 6 Days | 31 Oct 2022 | 05 Nov 2022 | 20 | 03 Nov 2022 |
| Sprint-3 | 20 | 6 Days | 07 Nov 2022 | 12 Nov 2022 | 20 | 10 Nov 2022 |
| Sprint-4 | 20 | 6 Days | 14 Nov 2022 | 19 Nov 2022 | 20 | 17 Nov 2022 |

# REPORT FROM JIRA:



# CODING AND SOLUTION

## FEATURE 1

AI-powered Nutrition Analyzer for Fitness Enthusiasts ● 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.).

```
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')#rendering the home page


@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 launch():
    if request.method=='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),showcase1=(x))
def nutrition(index):



    url = "https://calorieninjas.p.rapidapi.com/v1/nutrition"


    querystring = {"query":index}


    headers = {
        'x-rapidapi-key':
"5d797ab107mshe668f26bd044e64p1ffd34jsnf47bfa9a8ee4",
        'x-rapidapi-host': "calorieninjas.p.rapidapi.com"
        }


    response = requests.request("GET", url, headers=headers,
params=querystring)


    print(response.text)
```

```
    return response.json()['items']
if __name__ == "__main__":
   # running the app
    app.run(debug=False)
```

main.css:

```
.img-preview {
    width: 256px;
    height: 256px;
    position: relative;
    border: 5px solid #F8F8F8;
    box-shadow: 0px 2px 4px 0px rgba(0, 0, 0, 0.1);
    margin-top: 1em;
    margin-bottom: 1em;
}

.img-preview>div {
    width: 100%;
    height: 100%;
    background-size: 256px 256px;
```

```
    background-repeat: no-repeat;
    background-position: center;
}

input[type="file"] {
    display: none;
}

.upload-label{
    display: inline-block;
    padding: 12px 30px;
    background: #39D2B4;
    color: #fff;
    font-size: 1em;
    transition: all .4s;
    cursor: pointer;
}

.upload-label:hover{
    background: #34495E;
    color: #39D2B4;
```

```
}

.loader {
    border: 8px solid #f3f3f3; /* Light grey */
    border-top: 8px solid #3498db; /* Blue */
    border-radius: 50%;
    width: 50px;
    height: 50px;
    animation: spin 1s linear infinite;
}

@keyframes spin {
    0% { transform: rotate(0deg); }
    100% { transform: rotate(360deg); }
}
```

STYLE.CSS

```
body{
                                background-image:url(bg.jpg);
    background-size: 400% auto;
                                background-repeat: no-repeat;
                                background-position:center;
```

```
                color:#555;
                font-family:Arial, Helvetica, sans-
serif;
                font-size:16px;
                line-height:1.6em;
                margin:0;
}

.container{
                width:80%;
                margin:auto;
                overflow:hidden;
}

.justify{
    text-align:justify;
    text-justify: auto;
}

.parallax {
  /* The image used */
```

```
    background-image: url("doc.jpg");

  /* Set a specific height */
  min-height: 750px;

  /* Create the parallax scrolling effect */
  background-attachment: fixed;
  background-position: center;
  background-repeat: no-repeat;
  background-size: cover;
}

html {
  scroll-behavior: smooth;
}
#section2 {
  height: 500px;
  background: ;
}
div.background {
  background: url("static/bgg2.jpg");
```

```
  min-height: 5px;
 background-attachment: fixed;
  background-position: center;
  background-repeat: no-repeat;
  background-size: cover;
}



#navbar{
                        background-color:#fff;
                        color:#333;
}

#navbar ul{
                        padding:0;
                        list-style: none;
}

#navbar li{
                        display:inline;
}
```

```
#navbar a{
                    color:#fff;
                    text-decoration: none;
                    font-size:18px;
                    padding-right:15px;
}

#showcase{
                    min-height:300px;
                    margin-bottom:30px;
}


#showcase h1{
    width: 100%;
                    color:#333;
                    font-size:40px;
                    text-align: center;
                    line-height: 1em;
                    padding-top:10px;
```

```
}
#showcase h2{
    width: 100%;
                        color:#333;
                        font-size:30px;
                        text-align: center;
                        line-height: 1.6em;
                        padding-top:10px;
}

#main{
                        float:left;
                        color:#fff;
                        width:65%;
                        padding:0 30px;
                        box-sizing: border-box;
}

#sidebar{
                        float:right;
                        width:35%;
```

```
                        background-color: #ffcccc;
                        color:#000;
                        padding-left:10px;
                        padding-right:10px;
                        padding-top:1px;
                        box-sizing: border-box;
}


.img-preview {
    width: 10px;
    height: 10px;
    position: relative;
    border: 5px solid #F8F8F8;
    box-shadow: 0px 2px 4px 0px rgba(0, 0, 0, 0.1);
    margin-top: 1em;
    margin-bottom: 1em;
}

.img-preview>div {
    width: 10%;
```

```
    height: 10%;
    background-size: 100px 10px;
    background-repeat: no-repeat;
    background-position: center;
}

input[type="file"] {
    display: none;
}

.upload-label{
    display: inline-block;
    padding: 12px 30px;
    background: #39D2B4;
    color: #fff;
    font-size: 1em;
    transition: all .4s;
    cursor: pointer;
}

.upload-label:hover{
```

```
    background: #34495E;
    color: #39D2B4;
}

.myButton {
  border: none;
  text-align: center;
  cursor: pointer;
  text-transform: uppercase;
  outline: none;
  overflow: hidden;
  position: relative;
  color: #fff;
  font-weight: 700;
  font-size: 12px;
  background-color: #ff0000;
  padding: 10px 15px;
  margin: 0 auto;
  box-shadow: 0 5px 15px rgba(0,0,0,0.20);
}
```

```
.myButton span {
  position: relative;
  z-index: 1;
}

.myButton:after {
  content: "";
  position: absolute;
  left: 0;
  top: 0;
  height: 310%;
  width: 150%;
  background: #f2f2f2;
  -webkit-transition: all .5s ease-in-out;
  transition: all .5s ease-in-out;
  -webkit-transform: translateX(-98%) translateY(-25%) rotate(45deg);
  transform: translateX(-98%) translateY(-25%) rotate(45deg);
}

.myButton:hover:after {
```

```
  -webkit-transform: translateX(-9%) translateY(-25%)
rotate(45deg);
  transform: translateX(-9%) translateY(-25%) rotate(45deg);
}

.loader {
    border: 8px solid #f3f3f3; /* Light grey */
    border-top: 8px solid #ff0000; /* Red */
    border-radius: 50%;
    width: 50px;
    height: 50px;
    animation: spin 1s linear infinite;
}

@keyframes spin {
    0% { transform: rotate(0deg); }
    100% { transform: rotate(360deg); }
}

#main-footer{
                                background: #333;
```

```
                    color:#fff;
                    text-align: center;
                    padding:1px;
                    margin-top:0px;
}

@media(max-width:600px){
                    #main{
                      width:100%;
                      float:none;
                    }

                    #sidebar{
                      width:100%;
                      float:none;
                    }
}
```

Main.js

```
$(document).ready(function () {
```

```
    // Init
    $('.image-section').hide();
    $('.loader').hide();
    $('#result').hide();

    // Upload Preview
    function readURL(input) {
        if (input.files && input.files[0]) {
            var reader = new FileReader();
            reader.onload = function (e) {
                $('#imagePreview').css('background-image', 'url(' +
e.target.result + ')');
                $('#imagePreview').hide();
                $('#imagePreview').fadeIn(650);
            }
            reader.readAsDataURL(input.files[0]);
        }
    }
    $("#imageUpload").change(function () {
        $('.image-section').show();
        $('#btn-predict').show();
```

```
    $('#result').text('');
    $('#result').hide();
    readURL(this);
});

// Predict
$('#btn-predict').click(function () {
    var form_data = new FormData($('#upload-file')[0]);

    // Show loading animation
    $(this).hide();
    $('.loader').show();

    // Make prediction by calling api /predict
    $.ajax({
        type: 'POST',
        url: '/predict',
        data: form_data,
        contentType: false,
        cache: false,
        processData: false,
```

```
            async: true,
            success: function (data) {
                // Get and display the result
                $('.loader').hide();
                $('#result').fadeIn(600);
                $('#result').html(data);
                console.log('Success!');
            },
        });
    });

});
```

## 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.m
in.css" rel="stylesheet">
    <script
src="https://cdn.bootcss.com/popper.js/1.12.9/umd/popper.mi
n.js"></script>
    <script
src="https://cdn.bootcss.com/jquery/3.3.1/jquery.min.js"></sc
ript>
    <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://www.livingproofnyc.com/wp-
content/themes/livingproof/assets/img/hero-background.jpg");
    background-size: cover;
}
```

```
.bar
{
margin: 0px;
padding:20px;
background-color:white;
opacity:0.6;
color:black;
font-family:'Roboto',sans-serif;
font-style: italic;
border-radius:20px;
font-size:25px;
}
h3
{
margin: 0px;
padding:20px;
background-color:#9ACD32;
width: 800px;
opacity:0.6;
color:#000000;
font-family:'Roboto',sans-serif;
```

```
font-style: italic;
border-radius:20px;
font-size:25px;
}
a
{
color:grey;
float:right;
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;
                                    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: 2vw;
                                    width: 100%;
                                    height:8%;
                                    text-align: center;
                                }
                                .topnav {
  overflow: hidden;
  background-color: #FCAD98;
}

.topnav-right a {
  float: left;
  color: black;
  text-align: center;
  padding: 14px 16px;
  text-decoration: none;
  font-size: 22px;
}
```

```
.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%;">Nutrtion 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>
<br>
<br>
<br>
<br>
<br>
<br>
<br>
<h1>
```

<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>

</h1>

</body>

```
</html>
```

Image prediction.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>Predict</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://i.pinimg.com/originals/be/21/1a/be211ad5043a8d0
5757a3538bdd8f450.jpg");

    background-size: cover;

}

.bar

{

margin: 0px;

padding:20px;

background-color:white;

opacity:0.6;

color:black;

font-family:'Roboto',sans-serif;

font-style: italic;

border-radius:20px;

font-size:25px;
```

```
}
a
{
color:grey;
float:right;
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;
                                    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: 2vw;
                width: 100%;
                height:8%;
                text-align: center;
            }
            .topnav {
  overflow: hidden;
  background-color: #FCAD98;
}

.topnav-right a {
  float: left;
  color: black;
  text-align: center;
  padding: 14px 16px;
  text-decoration: none;
  font-size: 18px;
}

.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>
<div class="header">
<div style="width:50%;float:left;font-size:2vw;text-
align:left;color:black; padding-top:1%;padding-
left:5%;">Nutrtion Image Analysis</div>
  <div class="topnav-right"style="padding-top:0.5%;">
```

```
    <a href="{{ url_for('home')}}">Home</a>
    <a  class="active" href="{{ url_for('image1')}}">Classify</a>
  </div>
</div>
<br>



</div>
<div class="container">
       <center>
<div id="content" style="margin-top:2em">{% block content %}{% endblock %}</div></center>
    </div>
</body>


<footer>
    <script src="{{ url_for('static', filename='js/main.js') }}" type="text/javascript"></script>
</footer>
```

```
</html>
```

Image.html

```
<html>
{% extends "imageprediction.html" %} {% block content %}
<div style="float:left">
<br>
<br>
<h5><font color="black" size="3" font-family="sans-serif"><b>Upload image to classify</b></font></h5><br><br>

<div>
   <form id="upload-file" method="post" enctype="multipart/form-data">
      <label for="imageUpload" class="upload-label">
         Choose...
      </label>
      <input type="file" name="file" id="imageUpload" accept=".png, .jpg, .jpeg">
   </form>
```

```
  <center> <div class="image-section" style="display:none;">
      <div class="img-preview">
         <div id="imagePreview">
         </div></center>
      </div>
      <center><div>
         <button type="button" class="btn btn-primary btn-lg " id="btn-predict">Classify</button>
      </center></div>
   </div>

   <div class="loader" style="display:none;margin-left: 450px;"></div>

   <h3 id="result">

      <span><p style="padding-top: 25px;"><h4>Food Classified is : <h4><b><u>{{showcase}}{{showcase1}}</p> </span>
   </h3>

</div>
```

```
</div>



{% endblock %}
```

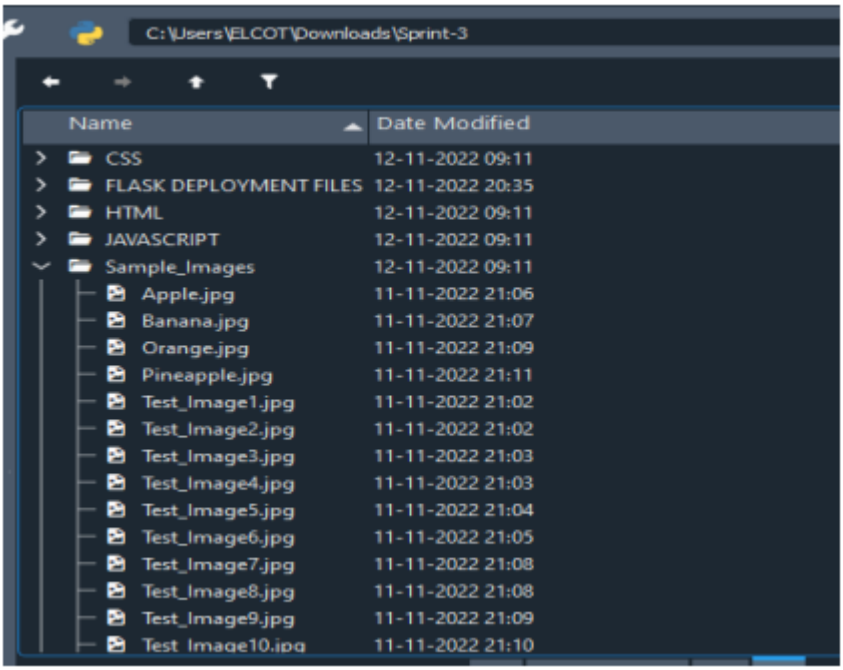
Template.html

```
<html lang="en" dir="ltr">
<head>
<style>


</style>
                    <meta charset="utf-8">
                    <title>Nutrition Image Analysis</title>
                    <link rel="shortcut icon" href="{{
url_for('static', filename='diabetes-favicon.ico') }}">
                    <link rel="stylesheet" type="text/css"
href="{{ url_for('static', filename='style.css') }}">
                    <script
src="https://kit.fontawesome.com/5f3f547070.js"
crossorigin="anonymous"></script>
```

```
                    <link
href="https://fonts.googleapis.com/css2?family=Pacifico&dis
play=swap" rel="stylesheet">
                </head>


                    <!-- Result -->
                    <div class="results">
                        <p style="padding-top: 150px;
color:blue;"><h4 style="color:blue;">Food Classified is:
<h4><b><h4
style="color:red;"><u>{{showcase1}}<h4><br><h4
style="color:red;"><u>{{showcase}}<h4></p>


                    </div>
                    <br>
                    <br>


    </div>
                </body>
</html>
```

# TESTING

## TEST CASES:




## USER ACCEPTANCE TESTING:

The purpose of this testing is to briefly explain the test coverage and open issues of the [AI- Powered Nutrition Analyzer For Fitness Enthusiasts] project at the time of the release to User Acceptance Testing (UAT).

# RESULTS

## PERFORMANCE METRICES:

```
[ ] model.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

 max_pooling2d (MaxPooling2D  (None, 31, 31, 32)       0
 )

 max_pooling2d_1 (MaxPooling  (None, 15, 15, 32)       0
 2D)

 flatten (Flatten)           (None, 7200)              0

 dense (Dense)               (None, 128)               921728

 dense_1 (Dense)             (None, 46)                5934

=================================================================
Total params: 928,558
Trainable params: 928,558
Non-trainable params: 0
_________________________________________________________________
```

# ADVANTAGES AND DISADVANTAGES

## ADVANTAGES:

- Food and food habits are ever-changing and evolving. People and professionals need to quickly adapt to new food products, diets, and changing preferences. The best way to instantly adapt to these changes is to have software that changes and adapts with you.
- Using automated nutrition analysis software will allow you to free up more time to innovate or grow your business. If you find a nutrition analysis software that has all the features you need, you can create much more time to focus on improving your business.
- Features such as a quick preview of nutrients while adding foods to diets, menus, and recipes give you the ability to save time when new recipes and food products are introduced.
- Having quick and easy software to help them plan their meals will save you tons of time.
- Self-rated methodologies, which are predominantly used for estimating eating behavior, being cost effective and easy to analyze, rely heavily on the participant's input.

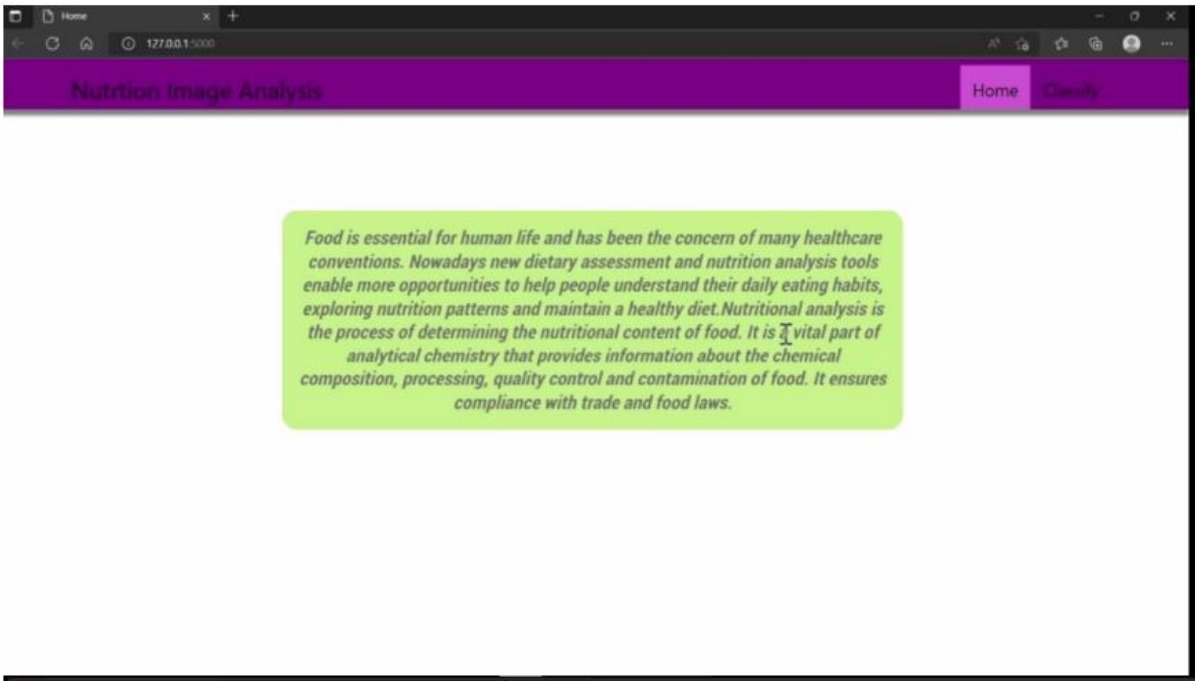
## DISADVANTAGES:

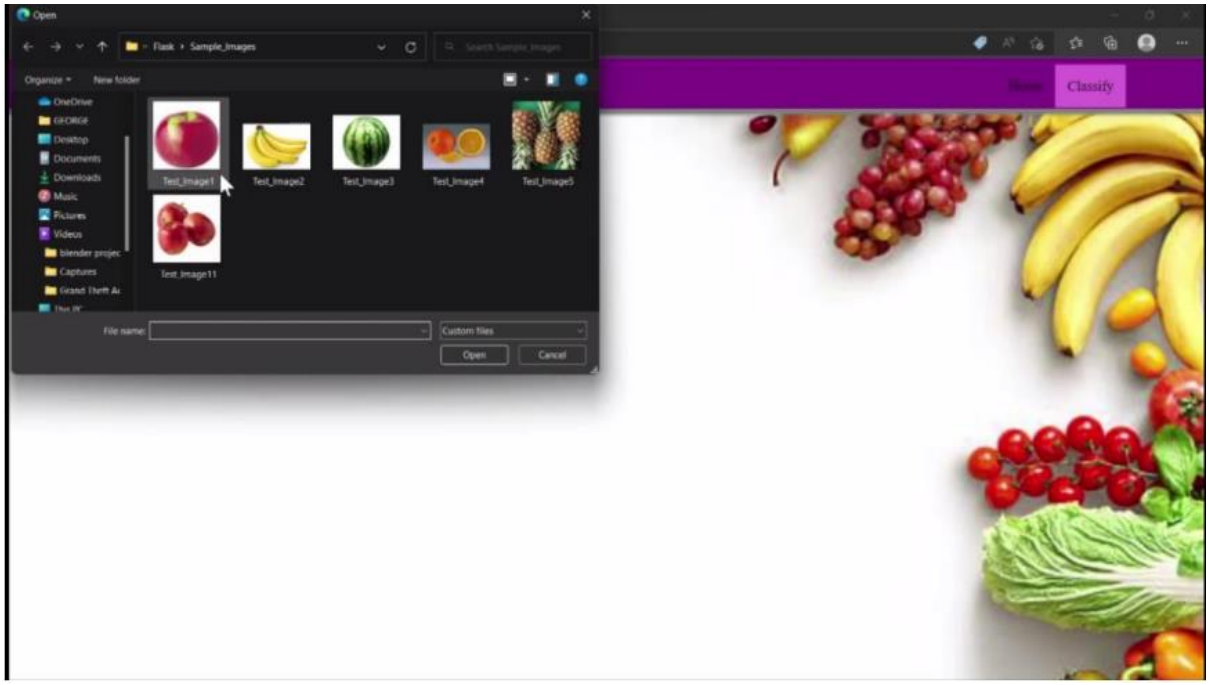
- Focuses on calorie counting and weight loss ,which may not be suitable for all users.

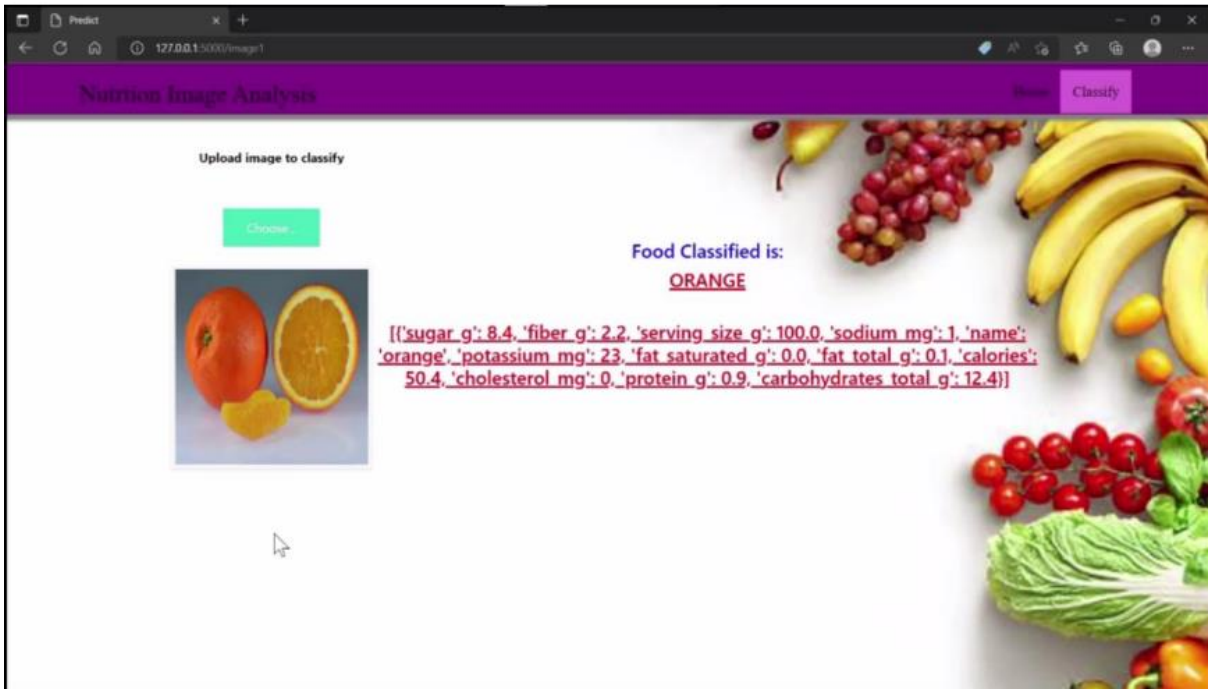
- Accuracy is not guaranteed though the app gets better over time.

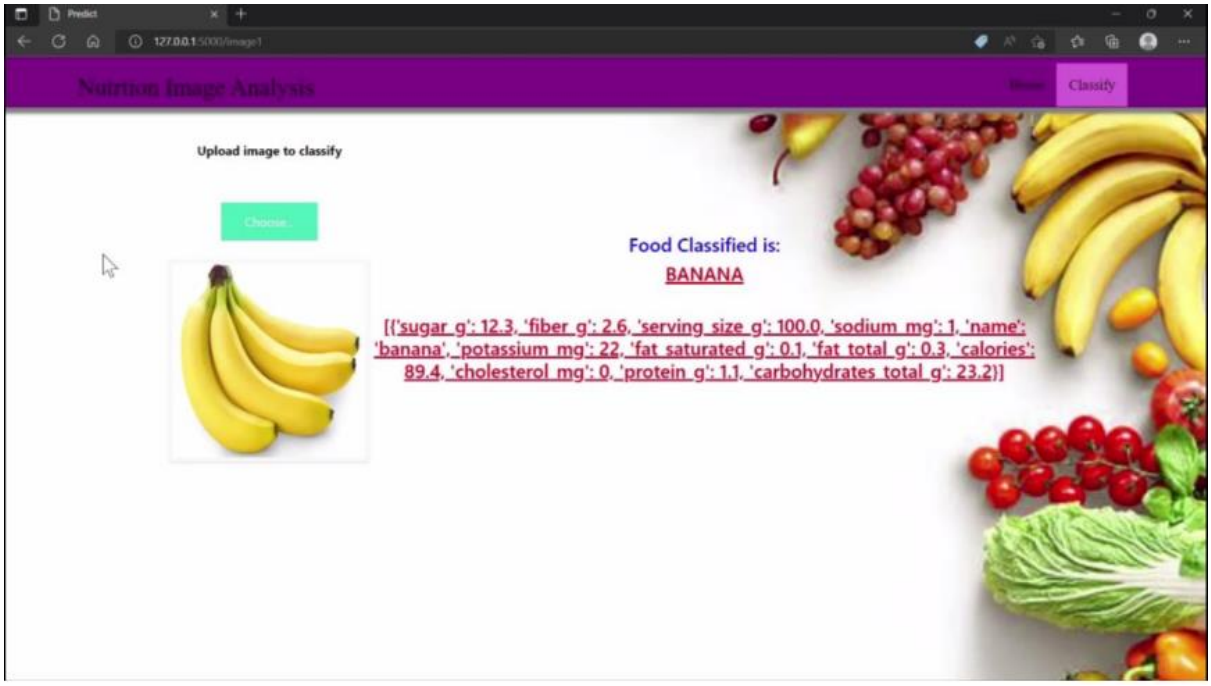
- Determining which nutrients are positive can be difficult depending on the type of sample use.

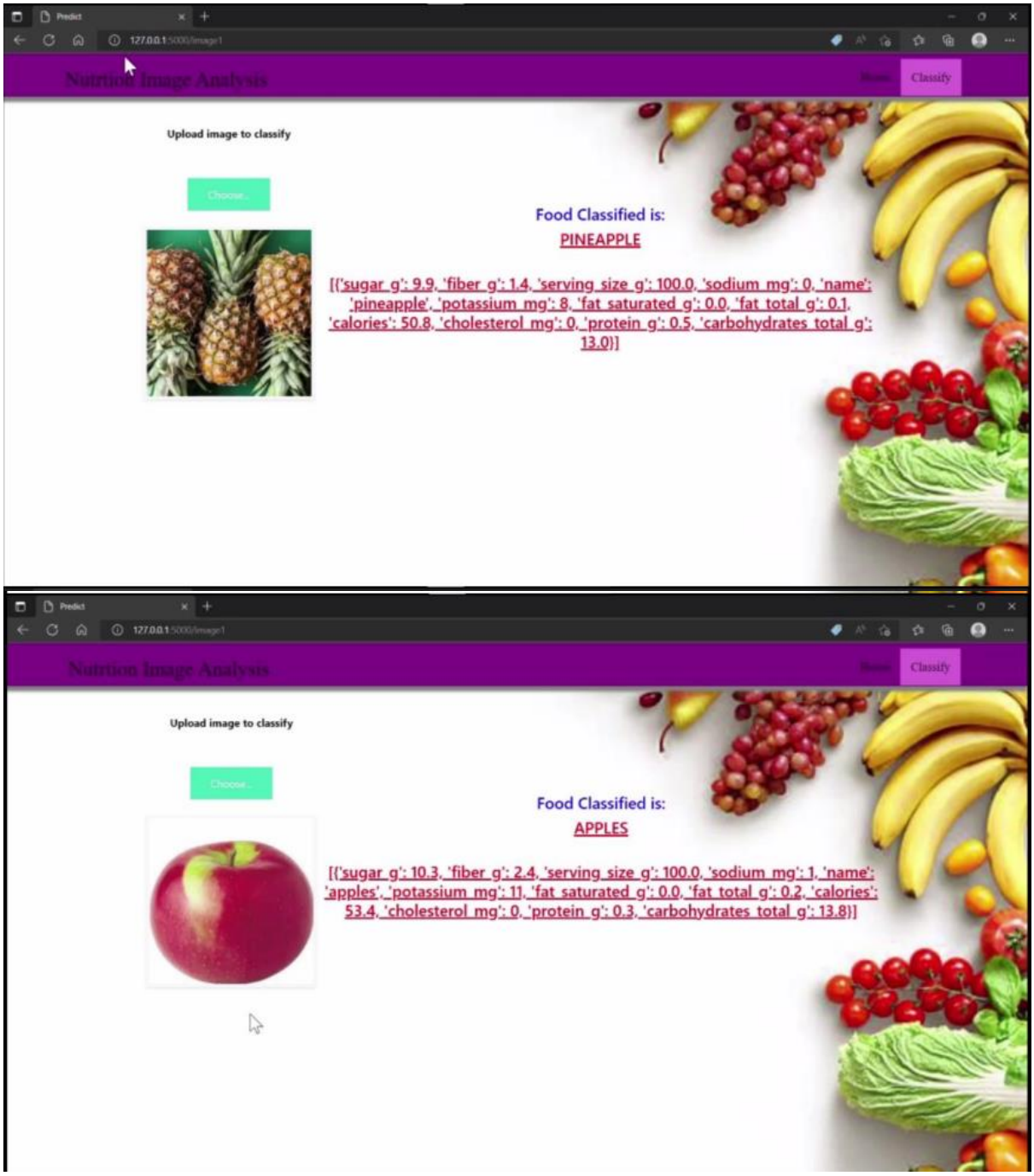
## OUTPUT:




Open
Flask › Sample_Images
Organize
New folder
OneDrive
Desktop
Documents
Downloads
Music
Pictures
Videos
Captures
Test_Image1
Test_Image2
Test_Image3
Test_Image4
Test_Image5
Test_Image11
File name:
Custom files
Open
Cancel
Home
Classify


Predict
127.0.0.1:5000/image1
Nutrition Image Analysis
Home
Classify
Upload image to classify
Choose...
Food Classified is:
ORANGE
[{'sugar_g': 8.4, 'fiber_g': 2.2, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'orange', 'potassium_mg': 23, 'fat_saturated_g': 0.0, 'fat_total_g': 0.1, 'calories': 50.4, 'cholesterol_mg': 0, 'protein_g': 0.9, 'carbohydrates_total_g': 12.4}]


Predict
127.0.0.1:5000/image1
Nutrition Image Analysis
Home
Classify
Upload image to classify
Choose...
Food Classified is:
BANANA
[{'sugar_g': 12.3, 'fiber_g': 2.6, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'banana', 'potassium_mg': 22, 'fat_saturated_g': 0.1, 'fat_total_g': 0.3, 'calories': 89.4, 'cholesterol_mg': 0, 'protein_g': 1.1, 'carbohydrates_total_g': 23.2}]


Predict
127.0.0.1:5000/image1
Nutrition Image Analysis
Home
Classify
Upload image to classify
Choose...
Food Classified is:
PINEAPPLE
[{'sugar_g': 9.9, 'fiber_g': 1.4, 'serving_size_g': 100.0, 'sodium_mg': 0, 'name': 'pineapple', 'potassium_mg': 8, 'fat_saturated_g': 0.0, 'fat_total_g': 0.1, 'calories': 50.8, 'cholesterol_mg': 0, 'protein_g': 0.5, 'carbohydrates_total_g': 13.0}]
Predict
127.0.0.1:5000/image1
Nutrition Image Analysis
Home
Classify
Upload image to classify
Choose...
Food Classified is:
APPLES
[{'sugar_g': 10.3, 'fiber_g': 2.4, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'apples', 'potassium_mg': 11, 'fat_saturated_g': 0.0, 'fat_total_g': 0.2, 'calories': 53.4, 'cholesterol_mg': 0, 'protein_g': 0.3, 'carbohydrates_total_g': 13.8}]

# CONCLUSION

Important obstacles to the accurate estimation of food quantity need to be overcome before these commercial platforms can be used as a real alternative to traditional dietary assessment methods. None of the platforms were capable of estimating the amount of food. These results demonstrate that certain platforms perform poorly while others perform decently

## FUTURE SCOPE

In the current project, we have implemented the idea that eating high-protein foods has many fitness benefits, including speeding recovery after exercise or injury, reducing muscle loss, building lean muscle, helping maintain a healthy weight, and curbing hunger. Studies have demonstrated that higher protein diets may spare lean body mass during weight loss, promote weight management, enhance glycemic regulation, and increase intestinal calcium absorption, which may result in long-term improvements in bone health.

# APPENDIX

**GITHUB LINK:**

**https://github.com/IBM-EPBL/IBM-Project-6329-1658826365**

**DEMO LINK:**

**https://github.com/IBM-EPBL/IBM-Project-6329-1658826365/blob/main/Final%20Deliverables/Demo%20Video/DEMO%20VIDEO.mp4**