Project Report

Team ID	PNT2022TMID51044
ProjectName	AI-Powered Nutrition Analyser 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 ExistingProblem

A number of regional traditional cuisines make up Indian cuisine. These cuisines differ greatly and utilise ingredients that may be found nearby due to the diversity of the land, climate, culture, ethnic groups, and vocations. A little over 1.4 billion people live in 36 states and union territories, each with their own distinctive cuisine and history. People today are more concerned about their health than ever before. However, there is a shortage of information on several food-related elements of wellness and fitness. As a result, Foodify.ai is created, a deep learning-based software that recognises food in images and delivers details about the item, including its protein, vitamin, calorie, mineral, and carbohydrate content.

The deep learning community does not have access to any such public dataset or application in the context of Indian food. In order to fill this research gap, The Foodify.ai is created. This app's objective is: The largest Indian food picture dataset in the world and an app that recognises Indian cuisine and offers dietary statistics.

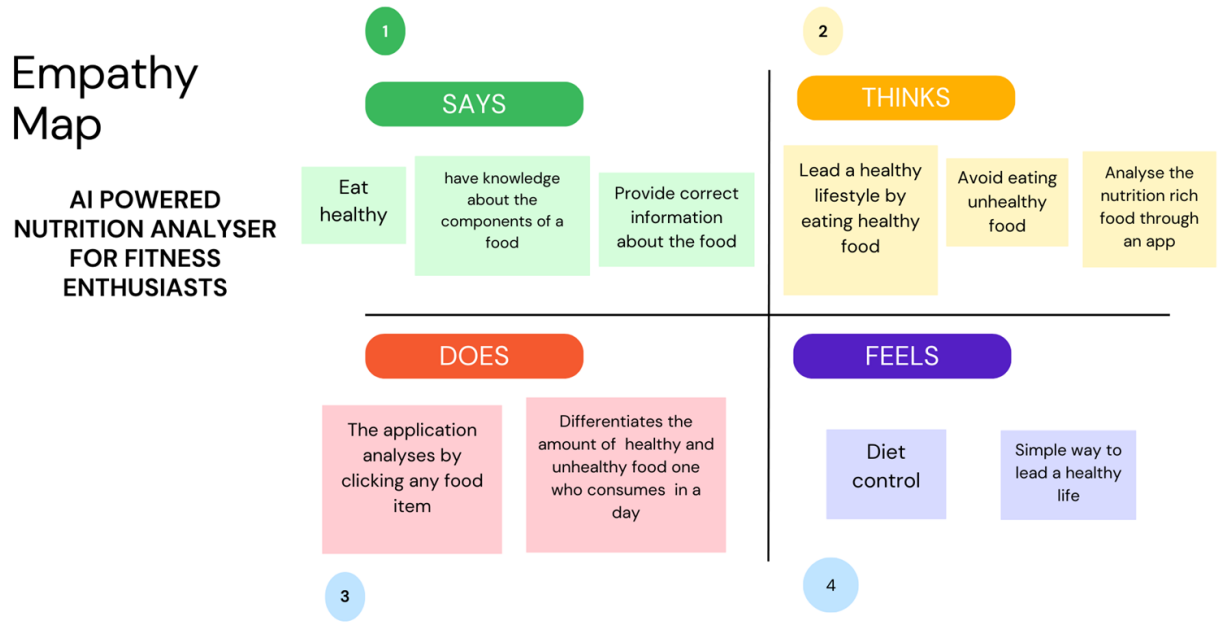
Stages of application is: Image Collection Application, Train Deep Learning Model and Develop Prototype Application, Create a nutrition Database and Develop Mobile App.

2.2 Problem Definition

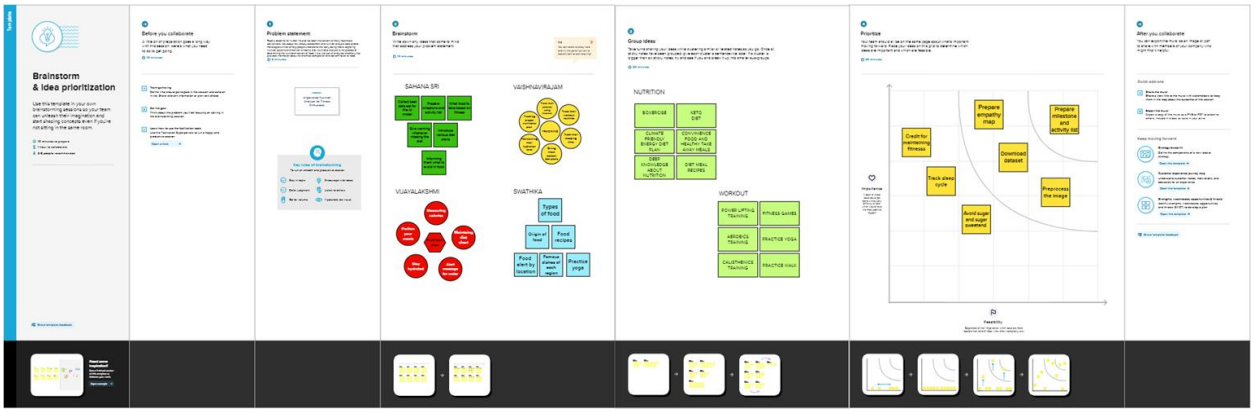
The primary goal of the project is to develop a model that will be used to categories fruits according to their many attributes, such as colour, shape, and texture. Here, users maytake pictures of various fruits, which are subsequently uploaded to a trained algorithm for analysis. The algorithm examines the picture and determines the nutritious content offruits such Sugar, Fibre, Protein, Calories, etc.

3.Ideation

3.1 Empathy Map



3.2 Brainstorming

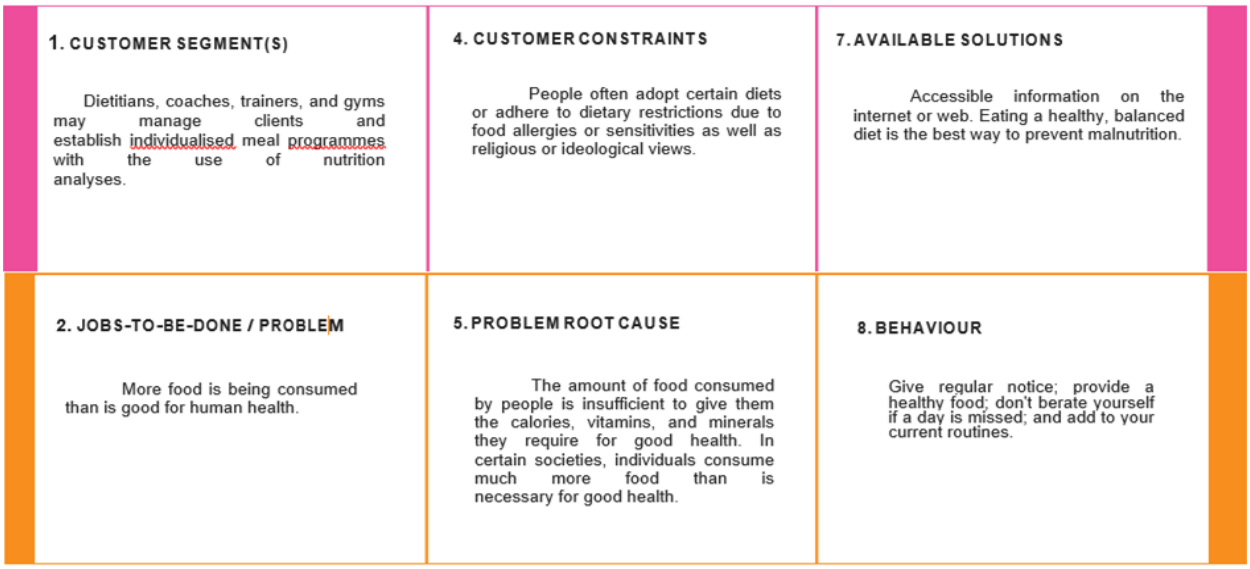


3.3 Proposed Solution

S.No	Parameter	Description
1.	Problem Statement	• The primary goal is to determine the nutrient content of a fruit from a camera-captured picture calories from a picture represent quite an fascinating area. • As nutrition tracking is important, vital part in leading a healthy lifestyle, this item may be useful to become indispensable in modern society each day.
2.	Solution Description	• The program will display the nutrient content of a fruit if the photograph is provided as an input. • Both image processing and result accuracy may be enhanced by feeding the model a variety of inputs during training.
3.	Novelty/Uniqueness	The application provides the personalized guidelines for an individual to maintain balanced food diet.

4.	Social Impact	This helps the people to know about the calories level, fibre content and protein content in the food by taking the image of a food item. This will acquire knowledge and provide information about nutrition. Thus people will lead a healthy lifestyle.
5.	Business Model	• An intuitive user interface makes the product easier to use consistently. As a result, economic growth increases. • The product will be distributed in a small, memory-conserving package and advertisements for foods and exercise to make money.
6.	Scalability of the Solution	It offers food item and ingredient details, the greatest health solutions, and meal plans for various criteria put forth by various people. The long-term strategy should be virtualized to inspire customers.

3.4 Problem Solution Fit



3. TRIGGERS	6. EMOTIONS: BEFORE / AFTER	9. YOUR SOLUTION
Nutritional analysis determines a food item's precise nutritional value. It establishes the proportion of macro- and micronutrients contained in that food item in addition to the presence of inhibitors, hazardous compounds, or any other novel component.	PRIOR TO: Poor health upkeep. AFTER: Appropriate health upkeep.	For the end user who utilises our application, wellness and mental health.

4.Requirement Analysis

4.1 Functional Requirements

S.No	Functional Requirements	Sub Requirements
1.	User Registration	-Registering via Gmail -Registering via mobile number -Facebook login for registration
2.	User Confirmation	Email confirmation required Reassurance through OTP
3.	User Management	Assembling a group of individuals who want to improve their health and getting them organised in a model setting will allow them to work together and support one another as they pursue their objectives. With the help of the programme, the fitness groups may successfully work through an issue by having the option to ask questions about it.
4.	User Satisfying	Each user's pleasure is essential, thus the UI/UX should be excellent to hold their interest in the platform, and the application's performance should be maximised to keep them using it for a long time. We must speak with each user individually on a regular basis (like once a month) in order to address their issues.

5.	User Requirements	Simply enter the ingredients and amounts for your recipe. The programme will quickly generate an accurate nutritional analysis of your food in a legible style that customers are accustomed to. With the information previously provided, the system can notify the user if any of the material triggers their allergies.

4.2 Non-Functional Requirements

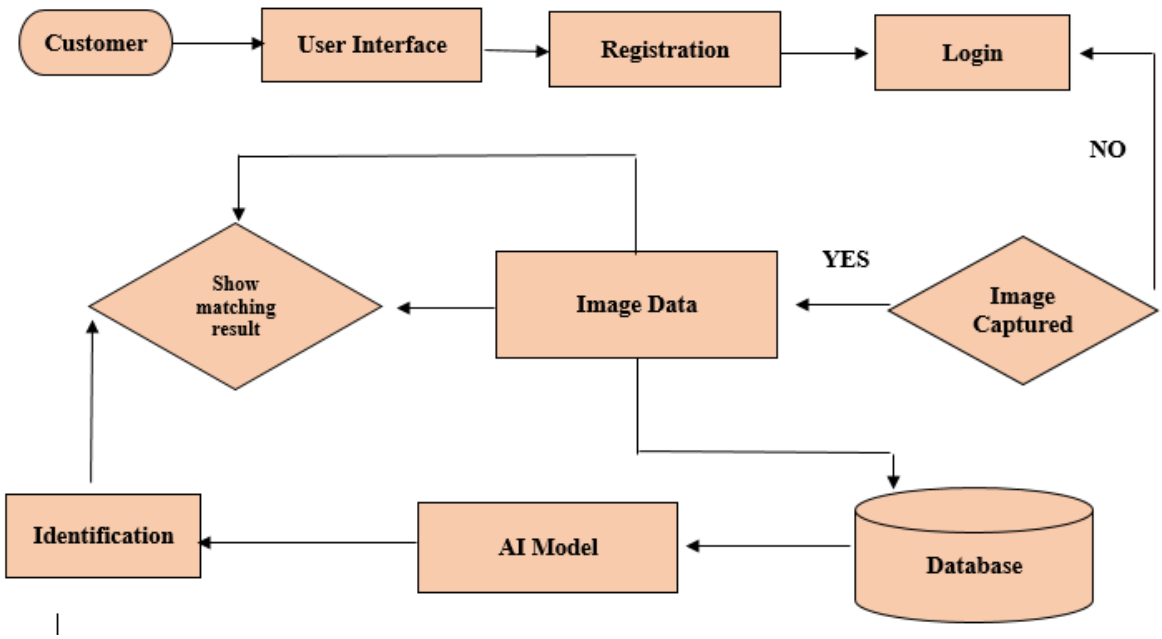
S.No	Non-Functional Requirements	Description
1.	Usability	Simply enter the ingredients and amounts for your recipe. The programme will quickly generate an accurate nutritional analysis of your food in a legible style that customers are accustomed to. With the information previously provided, the system can notify the user if any of the material triggers their allergies.
2.	Security	The security of an AI-powered nutrition analyser for fitness should be improved, including the security of any data we submit or keep. With the aid of the login and password, it offers more protection, allowing for more secure access to confidential data. It should be socially and economically accessible and safe to use.

3.	Reliability	It's crucial that the AI-powered nutrition analyser fitness services is trustworthy. How can one determine if it is trustworthy? Comparing the nutrition-based food with other nutrition-related applications makes it simple to determine whether or not it is dependable. However, it takes too much time, thus to prevent this a trustworthy programme should be created that determines whether or not we can obtain the right answer. Therefore, it is essential that the AI-powered nutrition analyser for fitness has accurate data and information so that we may learn the truth about it and receive accurate counsel regarding it.
4.	Performance	More consumers should be able to consume at any time and in any location. It ought to offer Usability, Scalability, Reliability, and Security. When over-paging websites or applications, it must have the bare minimum of data and must not be more than 20 MB. It should respond as quickly and without any time traffic as feasible while the page is being consumed. In order to use the connection when travelling or in distant areas, it should be regularly maintained. Nutritious cuisine to satisfy their dietary requirements and food choices for a healthy and active lifestyle. Foods and drinks that support health and ward off sickness should always be accessible, affordable, and readily available.

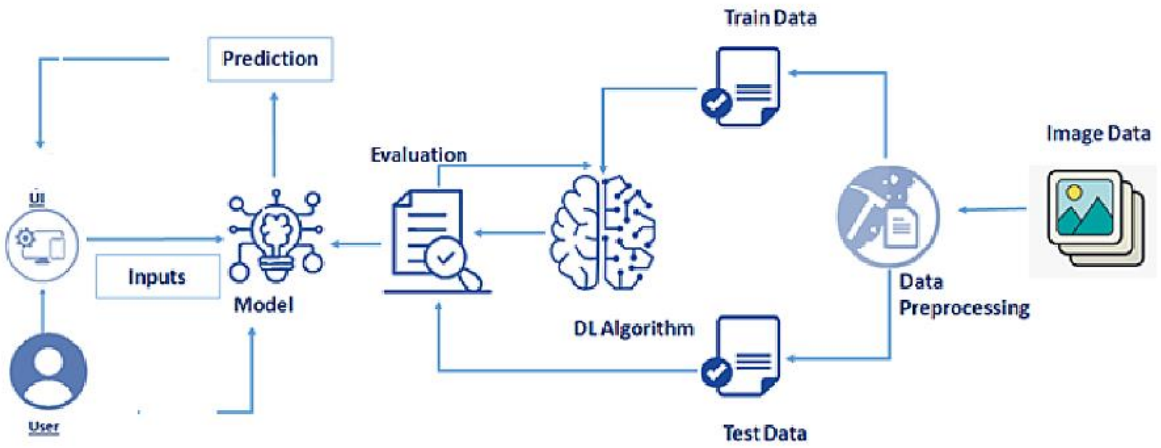
5.	Availability	Easy access to Data; prevents Data duplication and inaccuracy. Fast, effective, and user-friendly.
6.	Scalability	The architecture of the AI-powered Nutrition Analyser for fitness outlines the user's daily food consumption in detail and aids in the maintenance of a balanced diet.

5.Project Design

5.1 Data Flow Diagram



5.2 Technical Architecture



S.No	Component	Description	Technology
1.	User Interface	Predicts the user interaction with application	HTML, CSS, Javascript
2.	Application Logic-1	A fitness tool is used for analysing the nutrient	Python
3.	Application Logic-2	IBM Watson Health is a digital tool that helps the healthcare services through AI	IBM Watson STT service
4.	Database	Datatype, Configurations, Data, etc.,	MSSQL
5.	Cloud Database	Cloud Database Service	IBM DB2, IBM Cloudant
6.	Notification	Nutrition notification will be Sent from the server	Grid
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Services
8.	External API	External API is used in the Application	IBM Weather API, Aadhar API
9.	Machine Learning Model	Detect and identify the image and objects	Python Colab
10.	Infrastructure (Server / Cloud)	Application Deployment, Local Server Configuration, Cloud Server Configuration	Local, Cloud Foundry, Kubernetes, etc.,

Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Flask framework	Artificial Intelligence
2.	Security Implementations	Request authentication, Security cor ,etc.,	Encryption, firewalls
3.	Scalable Architecture	Supports high workloads	Artificial Intelligence
4.	Availability	Use of load, distributed Servers	Artificial Intelligence
5.	Performance	The application predicts the image up to 6000 per second	Artificial Intelligence

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	I may sign up for the programme as a user by providing my email address, a password, and a password confirmation.	I can login my dashboard or account.	High	Sprint-1
	Login	USN-2	When I register for the application as a user, I will get a confirmation email.	When I register for the application as a user, I will get a confirmation email.	High	Sprint-1
	Registration	USN-3	I may sign up for the application as a user through Facebook.	I may use Facebook to sign up and view the dashboard.	Low	Sprint-2
	Registration	USN-4	I may sign up for the application as a user using Gmail.	I can sign up via mail.	Medium	Sprint-1
	Login	USN-5	I may access the application as a user by providing my email address and password.	I have continuous access to the website as a user.	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 tothe website	I can upload the images	High	Sprint-2
	Calorie Tracker	USN-8	As a user, I have the option of manually entering my food consumption or five daily camera picture captures.	Every day, my food consumption is calculated and analysed.	Medium	Sprint-2
	Diet Plan	USN-9	I, as a user, am able to create my own diet plan using the vital components provided.	The AI model determines if my food has the necessary amounts of nutrients..	Low	Sprint-3
Customer (Web user)	Registration	USN-10	I may sign up for the programme as a user by providing my email address, a password, and a password confirmation.	I can login my account ordashboard	High	Sprint-3
Customer Care Executive	Solving customerqueries	USN-11	In the event that the application was unsuccessful, I should be able to contact customer service for assistance.	I can get suggestions & replies from it.	Medium	Sprint-2
Administrator	Database maintenance	US-12	I can manage all the user data & picture datasets collected by the AI model in my capacity as an administrator..	I can give numerous assurances on user security and data safety.	High	Sprint-4

6. Project Planning and Scheduling

6.1 Sprint Planning and Estimation

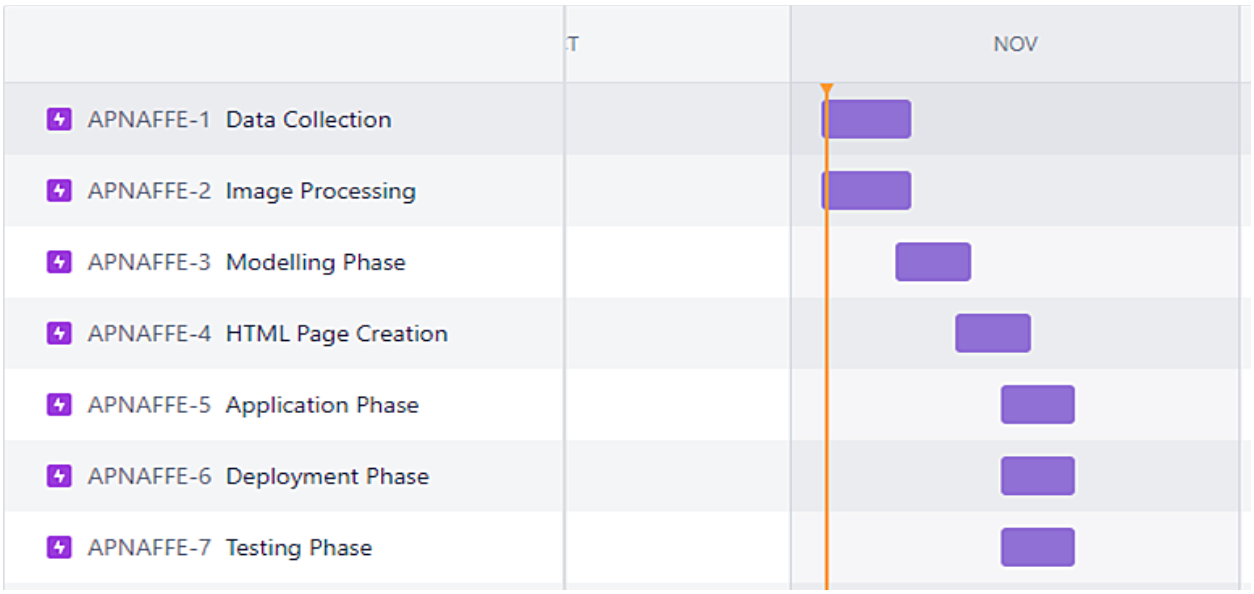
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Data Collection	USN-1	Gather pictures of various foodstuffs and group them according to their names into subdirectories. Make folders for the various food products that must be identified.	3	High	Swathika B
Sprint-1	Image Processing	USN-2	While applying various geometric modifications to photos, such as rotation, scaling, translation, et cetera, it is still possible to improve the image data by reducing unintentional distortions or enhancing certain image properties crucial for future processing.	3	High	Swathika B
Sprint-2	Modelling Phase	USN-3	To construct our convolutional neural network, which consists of an input layer, a convolution layer, a max-pooling layer, and an output layer.	4	High	Vaishnavirajam R
Sprint-3	HTML Page Creation	USN-4	The HTML page's input parameters are used The model is then given these variables in order to estimate the food's kind and determine how much nutrition it contains. In this project, we will use an API to determine the nutritional content.	4	Medium	Sahana sri R

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-4	Application Phase	USN-5	The creation of the Python code and the import of the Flask module into the project. Including the Flask module and performing routing pages in HTML	10	High	Sahana sri R
Sprint-4	Deployment Phase	USN-6	Deployment of application by using IBM cloud	10	High	Vijayalakshmi R
Sprint-4	Testing Phase	USN-7	Checking usability and accessibility and performance	10	High	Vijayalakshmi R

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)
Sprint-1	12	5 Days	03 Nov 2022	08 Nov 2022
Sprint-2	8	4 Days	08 Nov 2022	12 Nov 2022
Sprint-3	8	4 Days	12 Nov 2022	16 Nov 2022
Sprint-4	40	4 Days	16 Nov 2022	19 Nov 2022

6.3 Roadmap



7.Coding and Solutioning

7.1 Feature 1

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

```
Mounted at /content/drive
```

```
!unzip '/content/drive/MyDrive/fruits-360-original-size.zip'
```

```
# Import necessary library

from tensorflow.keras.preprocessing.image import ImageDataGenerator


# Data augmentation on training variable

train_datagen = ImageDataGenerator(rescale=1./255,
                                   zoom_range=0.2,
                                   horizontal_flip=True)


# Data augmentation on testing variable

test_datagen = ImageDataGenerator(rescale=1./255)


xtrain = train_datagen.flow_from_directory('/content/fruits-360-original-size/Training',
                                           target_size=(64,64),
                                           class_mode='categorical',
                                           batch_size=100)

     Found 6231 images belonging to 24 classes.


xtest = test_datagen.flow_from_directory('/content/fruits-360-original-size/Test',
                                         target_size=(64,64),
                                         class_mode='categorical',
                                         batch_size=100)

     Found 3110 images belonging to 24 classes.

model=Sequential()



from tensorflow.keras.layers import Convolution2D,MaxPooling2D,Flatten,
model=Sequential()


model.add(Convolution2D(32, (3,3), activation = 'relu', input_shape = (


model.add(MaxPooling2D(pool_size = (2,2)))


model.add(Flatten())


model.add(Dense(300, activation = "relu"))
model.add(Dense(150, activation = "relu"))


model.add(Dense(5, activation = "softmax"))
```

```
model.summary()
```

```
Model: "sequential_1"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

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

 flatten (Flatten)           (None, 30752)             0

 dense (Dense)               (None, 300)               9225900

 dense_1 (Dense)             (None, 150)               45150

 dense_2 (Dense)             (None, 5)                 755

=================================================================
Total params: 9,272,701
Trainable params: 9,272,701
Non-trainable params: 0
_________________________________________________________________
```

```
model.compile(optimizer='adam',loss='categorical_crossentropy',metrics=['accuracy'])
```

```
print(xtrain.class_indices)
```

```
{'apple_6': 0, 'apple_braeburn_1': 1, 'apple_crimson_snow_1': 2, 'apple_golden_1': 3
```

7.2 Feature 2

index.html

```
{% extends 'home.html' %}
{% block title %}
    {{title}}
{% endblock title %}
{% block content %}
    {% if succ %}

        <div class="hero">
          <p class="alert alert-success" role="alert" style="z-index:1;">{{ succ }}
          </p>
          <br>

          <h1>Nutrition Analysis for fitness authenuisasts</h1>
          </div>


    {% else %}
      <div class="hero">
        <div class="container-n">
            <h1>Nutrition Analysis for fitness</h1>
        </div>
      </div>

    {% endif %}
{% endblock content %}
```

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>{% block title %}{% end block title %}</title>
   <link rel="stylesheet" href="/static/style.css">
   <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.1/dist/css/bootstrap.min.css" rel="stylesheet"
integrity="sha384-iYQeCzEYFbKjA/T2uDLTpkwGzCiq6soy8tYaI1GyVh/UjpbCx/TYkiZhlZB6+fzT"
crossorigin="anonymous">
</head>
<body>
   <div id="content">
      <nav class="navbar navbar-dark navbar-expand-lg bg-dark">
         <div class="container-fluid">
           <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-
target="#navbarNavAltMarkup" aria-controls="navbarNavAltMarkup" aria-expanded="false" aria-
label="Toggle navigation">
             <span class="navbar-toggler-icon"></span>
           </button>
           <div class="collapse navbar-collapse" id="navbarNavAltMarkup">
             <div class="navbar-nav">
               <a class="nav-link active" aria-current="page" href="/">Home</a>
               <a class="nav-link" href="analysis">Analysis</a>
               <a class="nav-link" href="classify">Classify</a>
               <a class="nav-link" href="detail">Detail</a>
             </div>
           </div>
         </div>
       </nav>
      {% block content %}
      {% endblock content %}
   </div>
   <script src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.1/dist/js/bootstrap.bundle.min.js"
integrity="sha384-
u1OknCvxWvY5kfmNBILK2hRnQC3Pr17a+RTT6rIHI7NnikvbZlHgTPOOmMi466C8"
crossorigin="anonymous"></script>
</body>
</html>
```

detail.html

```
{% extends 'home.html' %}
```

```
{% block title %}
   {{title}}
{% endblock title %}
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Details</title>
   <link rel="stylesheet" href="/static/style.css">
   <link
href="https://fonts.googleapis.com/css2?family=Poppins:wght@300;400;500;600;700&display=swap"
rel="stylesheet">
   <link href=" https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
free@5.15.4/css/fontawesome.min.css">
   <script src="https://kit.fontawesome.com/4104765148.js" crossorigin="anonymous"></script>
</head>
<body>

   <div class="header">
   <div class="container">
     <div class="navbar">
      <div class="logo">
         <a href="analysis.html"><img src="../static/fruit9.jpg"S width="150px"></a>
         <strong><br><br>NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS</strong>
      </div>
      <nav>
         <ul id="MenuItems">
            <li><strong><a href="analysis.html">HOME</a></strong></li>
            <li><strong><a href="classify.html">CLASSIFY</a></strong></li>

         </ul>


      </nav>

     </div>


   </div>
  </div>

   <!------------------single product details------>
   <div class="small-container single-product">
      <div class="row">
         <div class="col-2">
            <img src="../static/apple.jpg" width="100%" id="ProductImg">
            <div class="small-img-row">
               <div class="small-img-col">
                  <img src="../static/6_100.jpg" width="100%" class="small-img">
               </div>
```

```
                <div class="small-img-col">
                    <img src="../static/177_100.jpg" width="100%" class="small-img">
                </div>
                <div class="small-img-col">
                    <img src="../static/181_100.jpg" width="100%" class="small-img">
                </div>
                <div class="small-img-col">
                    <img src="../static/6_100.jpg" width="100%" class="small-img">
                </div>

            </div>
        </div>
        <div class="col-2">

            <h1>APPLES</h1>



            <h3>Details <i class="fa fa-indent"></i></h3>
            <br>
            <p>Here are the nutrition facts for one raw, unpeeled, medium-sized apple (100 grams):<br>

Calories: 52<br>
Water: 86%<br>
Protein: 0.3 grams<br>
Carbs: 13.8 grams<br>
Sugar: 10.4 grams<br>
Fiber: 2.4 grams<br>
Fat: 0.2 grams</p>
        </div>
    </div>
</div>

<!------------------title------------->
<div class="small-container">
    <div class="row row-2">
        <h2>Related:</h2>
        <p>View More</p>
    </div>
</div>

<!------- featured categories -------->
<div class="small-container">
        <div class="row">
        <div class="col-4">
            <img src="../static/orange.jpg">
            <h4>Orange</h4>


        </div>
        <div class="col-4">
```

```
            <img src="../static/melon.jpg">
            <h4>Water Melon</h4>

        </div>
        <div class="col-4">
            <img src="../static/grapes.jpg">
            <h4>Grapes</h4>

        </div>

    </div>


</div>



<!--------------js for toggle menu------>
<script>
    var MenuItems=document.getElementById("MenuItems");
    MenuItems.style.maxHeight="0px";
    function menutoggle(){
        if(MenuItems.style.maxHeight=="0px")
            {
                MenuItems.style.maxHeight="200px";
            }
        else
            {
                MenuItems.style.maxHeight="0px";
            }
    }
</script>

<script>
    var ProductImg = document.getElementById("ProductImg");
    var SmallImg = document.getElementsByClassName("small-img");

    SmallImg[0].onclick = function()
    {
        ProductImg.src = SmallImg[0].src;
    }
     SmallImg[1].onclick = function()
    {
        ProductImg.src = SmallImg[1].src;
    }
      SmallImg[2].onclick = function()
    {
        ProductImg.src = SmallImg[2].src;
    }
       SmallImg[3].onclick = function()
    {
```

```
        ProductImg.src = SmallImg[3].src;
      }
    </script>

</body>
</html>
{% endblock content %}
```

classify.html

```
{% extends 'home.html' %}
{% block title %}
    {{title}}
{% endblock title %}
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Classify</title>
    <link rel="stylesheet" href="/static/style.css">
    <link
href="https://fonts.googleapis.com/css2?family=Poppins:wght@300;400;500;600;700&display=swap"
rel="stylesheet">
    <link href=" https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
free@5.15.4/css/fontawesome.min.css">
    <script src="https://kit.fontawesome.com/4104765148.js" crossorigin="anonymous"></script>
</head>
<body>

    <div class="header">
    <div class="container">
      <div class="navbar">
       <div class="logo">
          <a href="analysis.html"><img src="../static/fruit9.jpg"S width="150px"></a>
          <strong><br><br>NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS</strong>
       </div>
       <nav>
          <ul id="MenuItems">
             <li><strong><a href="analysis.html">HOME</a></strong></li>
             <li><strong><a href="classify.html">CLASSIFY</a></strong></li>

          </ul>


       </nav>

      </div>

    </div>
   </div>
```

```
<!------- featured categories -------->
<div class="small-container">
   <div class="row row-2">
      <h2>IMAGES</h2>
   </div>
   <div class="row">
      <div class="col-4">
         <a href="detail.html"><img src="../static/apple.jpg"></a>
         <h4>APPLE</h4>

      </div>
      <div class="col-4">
         <img src="../static/banana.jpg">
         <h4>BANANA</h4>

      </div>

      <div class="col-4">
         <img src="../static/orange.jpg">
         <h4>ORANGE</h4>

      </div>
   </div>


      <div class="row">
      <div class="col-4">
         <img src="../static/pineapple.jpg">
         <h4>PINEAPPLE</h4>

      </div>
      <div class="col-4">
         <img src="../static/strawbery.jpg">
         <h4>STRAWBERY</h4>

      </div>

      <div class="col-4">
         <img src="../static/jackfru.jpg">
         <h4>JACKFRUIT</h4>

      </div>
   </div>

     <div class="row">
      <div class="col-4">
         <img src="../static/grapes.jpg">
         <h4>GRAPES</h4>

      </div>
```

```
            <div class="col-4">
            <img src="../static/cherry.jpg">
            <h4>CHERRY</h4>

          </div>
            <div class="col-4">
            <img src="../static/melon.jpg">
            <h4>WATERMELON</h4>

          </div>



      </div>


   </div>

   <!--------------js for toggle menu------>
   <script>
      var MenuItems=document.getElementById("MenuItems");
      MenuItems.style.maxHeight="0px";
      function menutoggle(){
         if(MenuItems.style.maxHeight=="0px")
            {
               MenuItems.style.maxHeight="200px";
            }
         else
            {
               MenuItems.style.maxHeight="0px";
            }
      }
   </script>
</body>
</html>
{% endblock content %}
```

analysis.html

```
{% extends 'home.html' %}
{% block title %}
   {{title}}
{% endblock title %}
{% block content %}
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width,initial-scale=1.0">
   <title> Analysis</title>
   <link rel="stylesheet" href="/static/style.css">
```

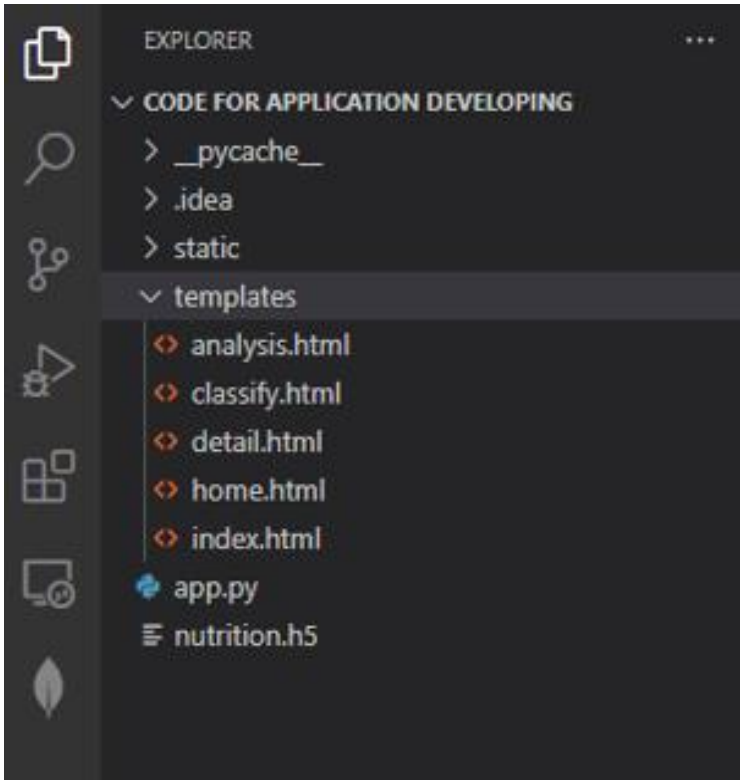
```
    <link
href="https://fonts.googleapis.com/css2?family=Poppins:wght@300;400;500;600;700&display=swap"
rel="stylesheet">
    <link href=" https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-
free@5.15.4/css/fontawesome.min.css">
    <script src="https://kit.fontawesome.com/4104765148.js" crossorigin="anonymous"></script>
</head>
<body>

     <div class="header">
    <div class="container">
      <div class="navbar">
        <div class="logo">
           <a href="analysis.html"><img src="../static/fruit9.jpg"S width="150px"></a>
           <strong><br><br>NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS</strong>
        </div>
        <nav>
           <ul id="MenuItems">
              <li><strong><a href="analysis.html">HOME</a></strong></li>
              <li><strong><a href="classify.html">CLASSIFY</a></strong></li>

           </ul>


        </nav>

      </div>

    </div>
   </div>



        <div class="row">
           <div class="col-2">

              <h1>OBJECTIVE</h1>
              <p>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.</p>

           </div>
           <div class="col-2">
              <img src="../static/fruit-14.jpg" alt="">

           </div>
        </div>
```

```
    <div class="row">
      <div class="col-2">

        <h1>AIM</h1>
        <p>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.).</p>

      </div>
      <div class="col-2">
        <img src="../static/fruit3.jpg" alt="">

      </div>
    </div>


  <!------- featured categories -------->
  <div class="categories">
    <div class="small-container">
      <div class="row">
      <div class="col-3">
        <img src="../static/fruit-14.jpg">
      </div>
      <div class="col-3">
        <img src="../static/fruit10.jpg">
      </div>
      <div class="col-3">
        <img src="../static/fruit12.jpg">
      </div>
    </div>

    </div>

  </div>
  <!---------- featured products -------->
  <div class="small-container">
    <h2 class="title">Description</h2>
    <div class="row">
      <div class="col-4">
        <img src="../static/fruit7.jpg">

        <a href="" class="btn">GIT &#8594</a>


      </div>
      <div class="col-4">
        <img src="../static/fruit13.jpg">

        <a href="" class="btn">DOCUMENT &#8594</a>
```

```
            </div>
            <div class="col-4">
                <img src="../static/fruit11.jpg">

                <a href="" class="btn">DEMO &#8594</a>


            </div>

        </div>


    </div>
    <!--------------js for toggle menu------>
    <script>
        var MenuItems=document.getElementById("MenuItems");
        MenuItems.style.maxHeight="0px";
        function menutoggle(){
            if(MenuItems.style.maxHeight== "0px")
                {
                    MenuItems.style.maxHeight="200px";
                }
            else
                {
                    MenuItems.style.maxHeight="0px";
                }
        }
    </script>
</body>
</html>
{% endblock content %}
```

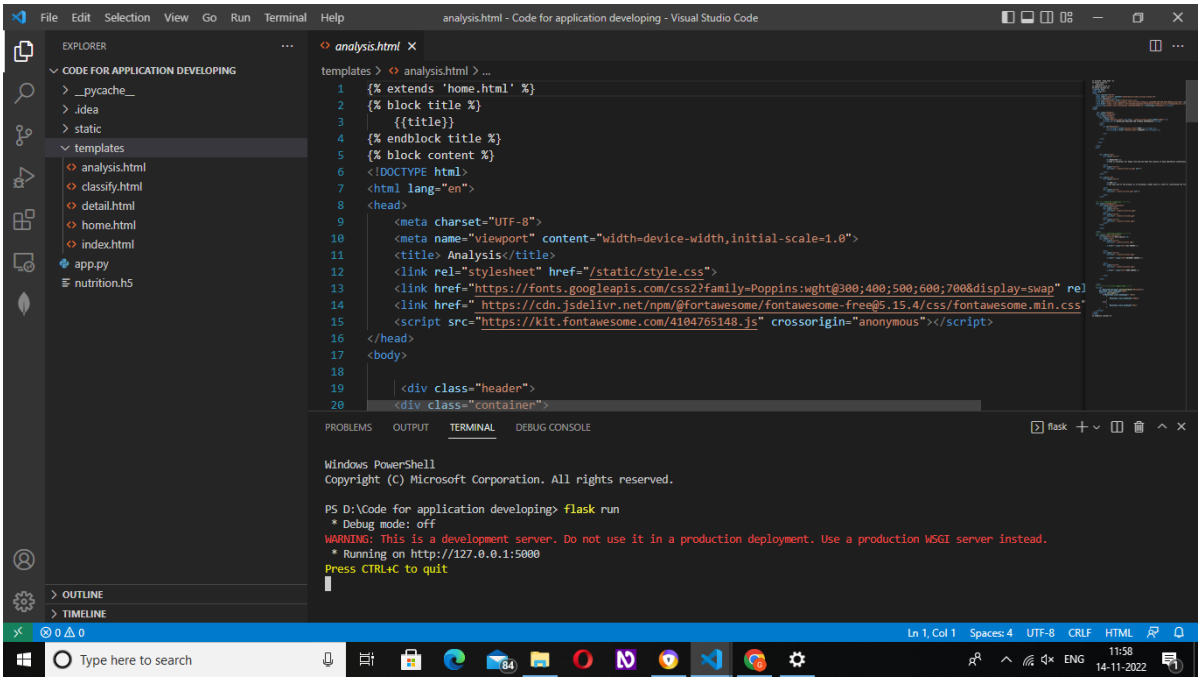
8.Testing

8.1 Test Cases



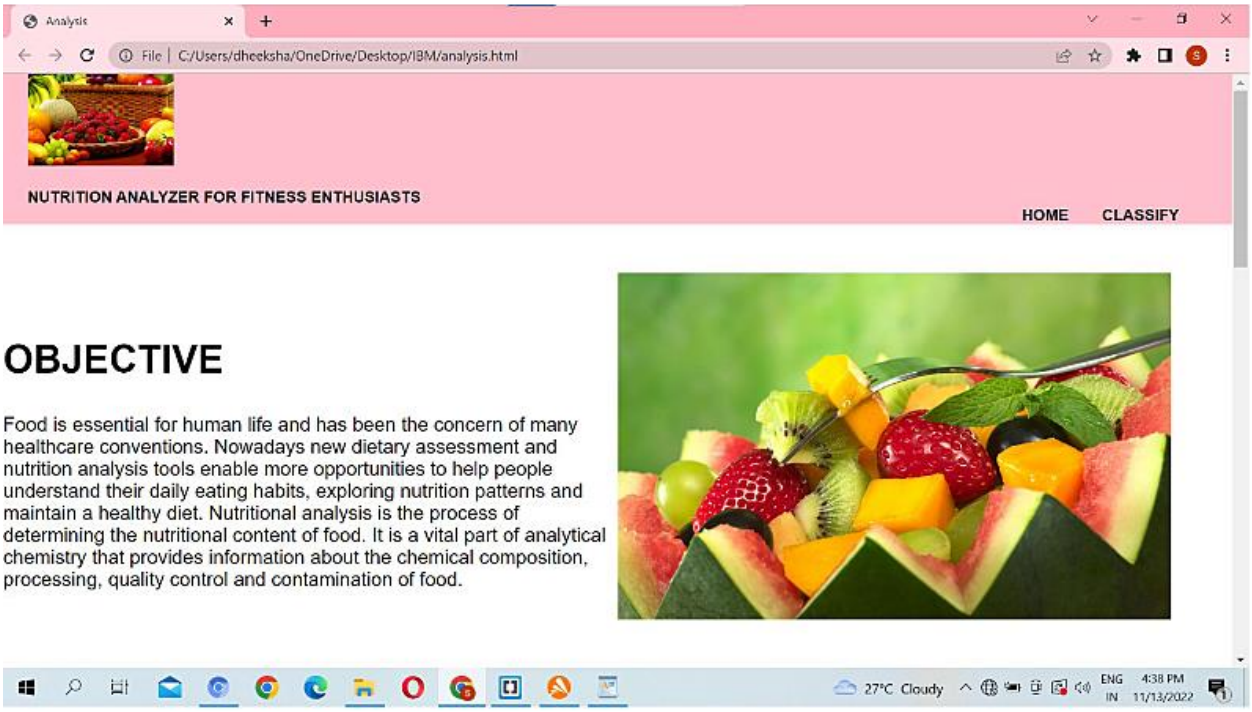
9.Results

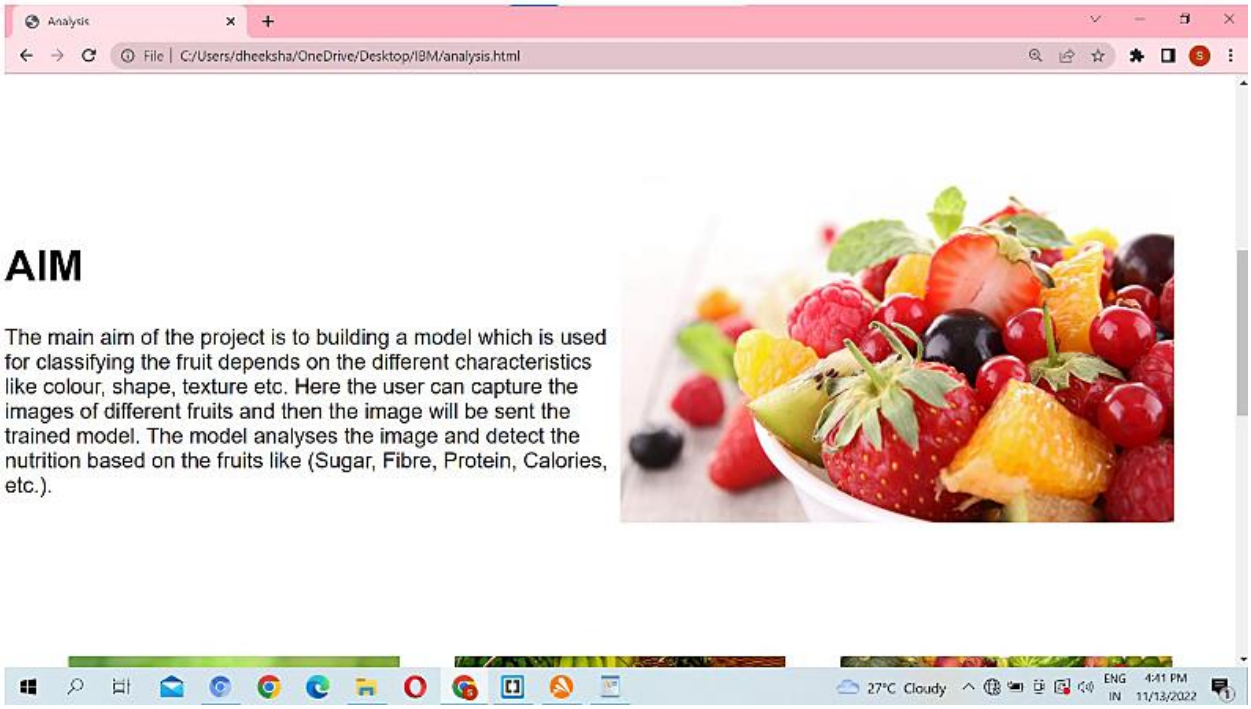
9.1 Performance Metrics

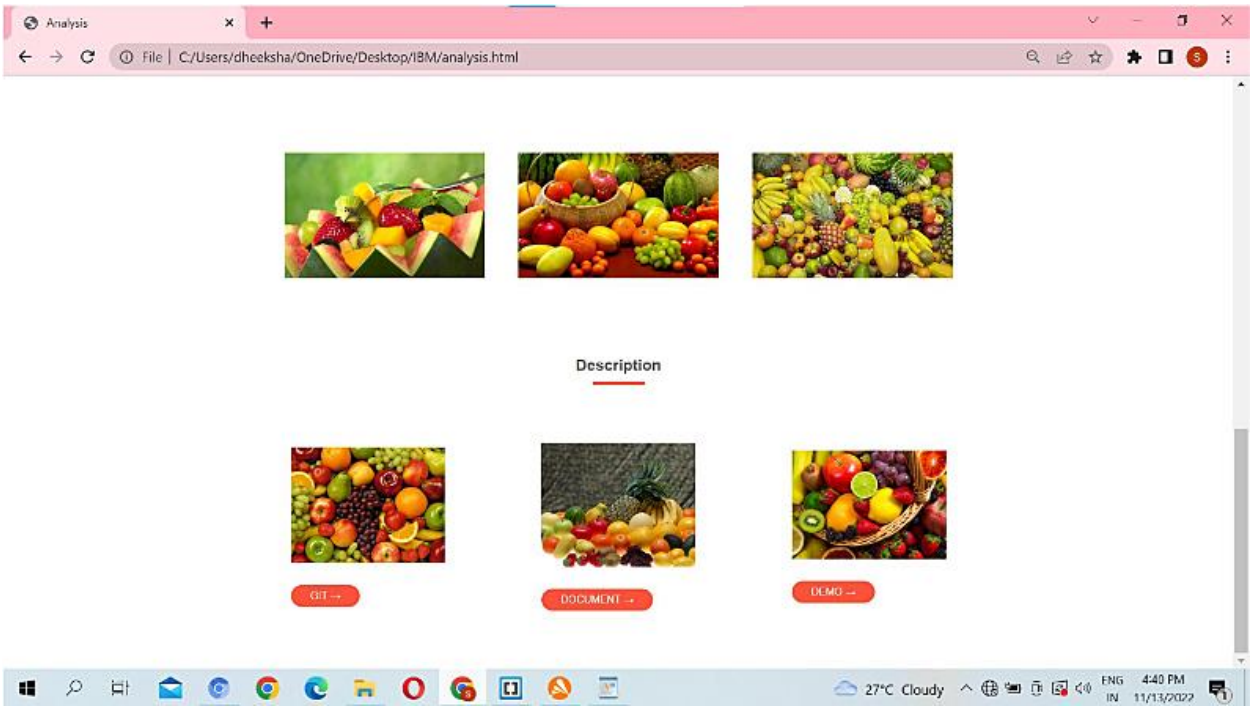


9.2 Output

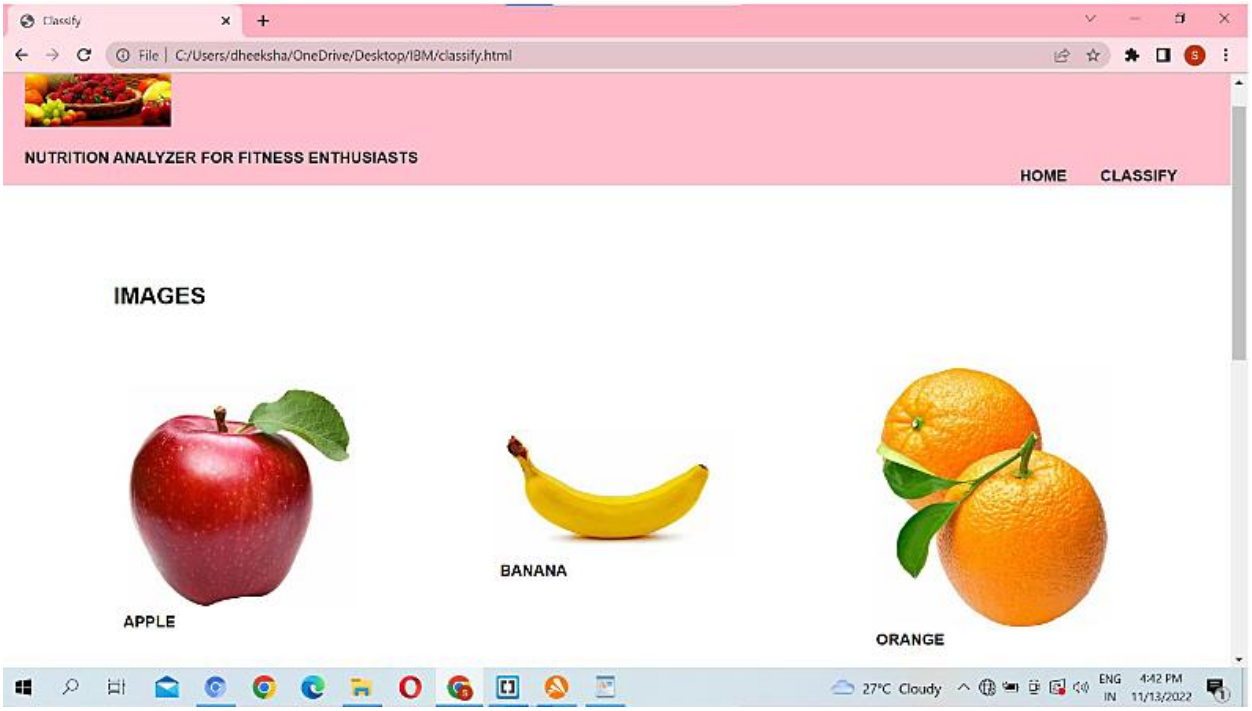
9.2.1 analysis.html

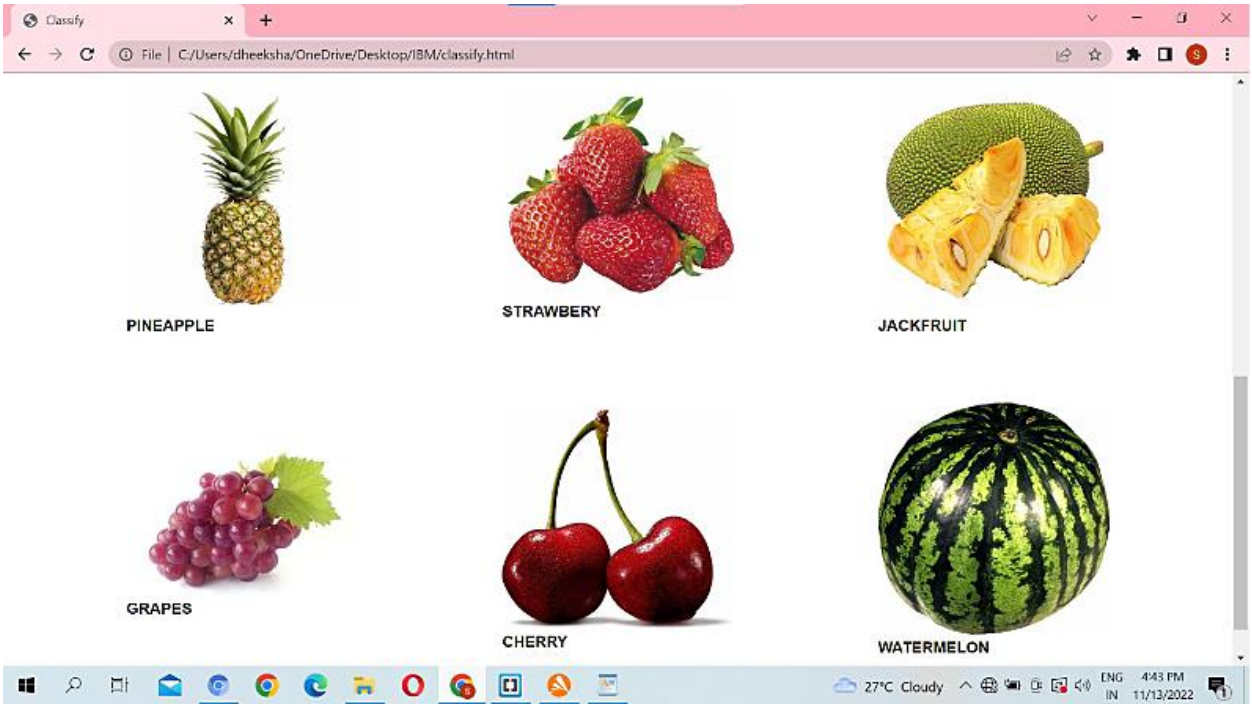



Analysis
File | C:/Users/dheeksha/OneDrive/Desktop/IBM/analysis.html
AIM
The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then 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.).
27°C Cloudy
ENG IN
4:41 PM
11/13/2022

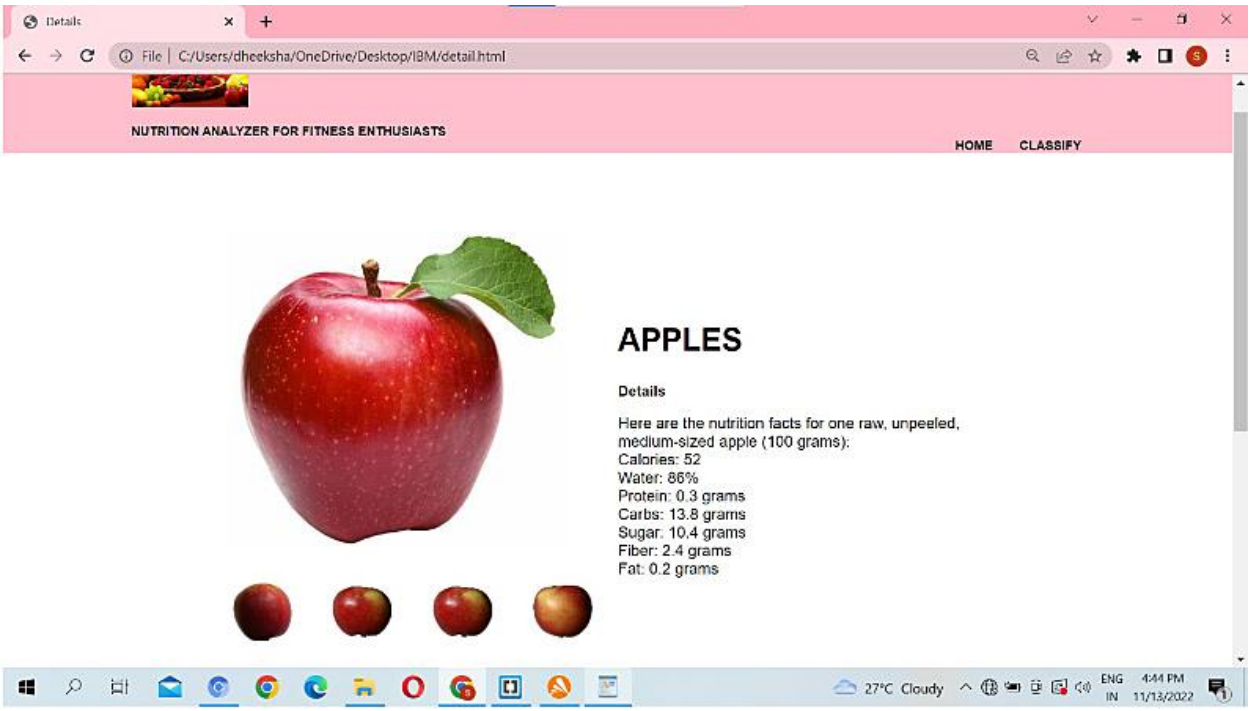

Analysis
File | C:/Users/dheeksha/OneDrive/Desktop/IBM/analysis.html
Description
GIT →
DOCUMENT →
DEMO →
27°C Cloudy
ENG IN
4:40 PM
11/13/2022

9.2.2 classify.html





9.2.3 detail.html



10.Advantages and Disadvantages

10.1 Advantages

- More options to assist individuals in understanding their daily eating patterns are made possible by the new dietary assessment and nutrition analysis tools.
- It assists people in examining their regular dietary habits, which is highly helpful for preserving a balanced, nutritious diet.
- To ascertain the nutritional value of food, nutritional analysis is utilised.
- The expense of travelling to see a dietician is eliminated with this application.
- The time needed to choose the appropriate diet plan is significantly reduced while using this programme.

10.2 Disadvantages

- If the server is down, the user with an Android mobile device won't be able to input or see details.Therefore, one point failure has drawbacks.

11.Conclusion

- By the project's conclusion, we will be familiar with the basic theories and methods of convolutional neural networks.
- Get a thorough knowledge of picture data.
- Understand how to use the Flask framework to construct a web application.
- Able to use various data pretreatment techniques to clean the data and preprocess it.

12.Future Scope

- AI is transforming the health sector.
- AI is currently being used to change people's habits, in addition to being primarily utilised to improve marketing and sales choices.
- In the future, we don't want to exercise or follow any diets. We can follow our diet programmes without anyone else's assistance by utilising this nutrition fitness analyzer, which will also enable us to live a happy, healthy life with plenty of money.
- AI can simply monitor your health-related activities and recurrent activity routines, using the information to direct you toward your diet and fitness goals.

13.Appendix

Source Code
https://colab.research.google.com/drive/10Cz0GQQ1Ry4qgrae7YC4U46HTKVUqQwU?usp=sharing

https://colab.research.google.com/drive/1XiMjhLelQWB5rzMayLFVKYIkUgBxvBU-?usp=sharing

GitHub
https://github.com/IBM-EPBL/IBM-Project-40591-1660631742

Demo Link
https://drive.google.com/file/d/1NFCnlRqW_VDADP_D2fn4wK8uDcfgx_WW/view?usp=sharing