

PROJECT REPORT

AI- POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

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1 INTRODUCTION:

OVERVIEW

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.

- **Project requirements:** IBM cloud , Python colab , Flask Framework
- **Project Deliverables:** Application for Nutrition Analyzer for Fitness Enthusiasts.

PURPOSE

One of the concerning problems in the society nowadays is that they have a poor tracking ability (Boreham et al., 2004) where it is difficult to keep track of their exercise statistics such as calories, distance travelled, speed, as well as steps taken. It is virtually impossible to keep track of all these statistics conveniently due to several reasons such as lack of measuring tools and self-perseverance to carry out the exercise consistently which will make them to give up eventually. Some of them also find it extremely hard to be motivated and keep exercising constantly due to the fact that exercising is totally voluntary based . Other than that, people also must not forget about diet plays an important part in achieving a healthy lifestyle yet it is also a tough task when it comes to keep track of their diets in terms of what they consume and how much they consume every day.

2 LITERATURE SURVEY:

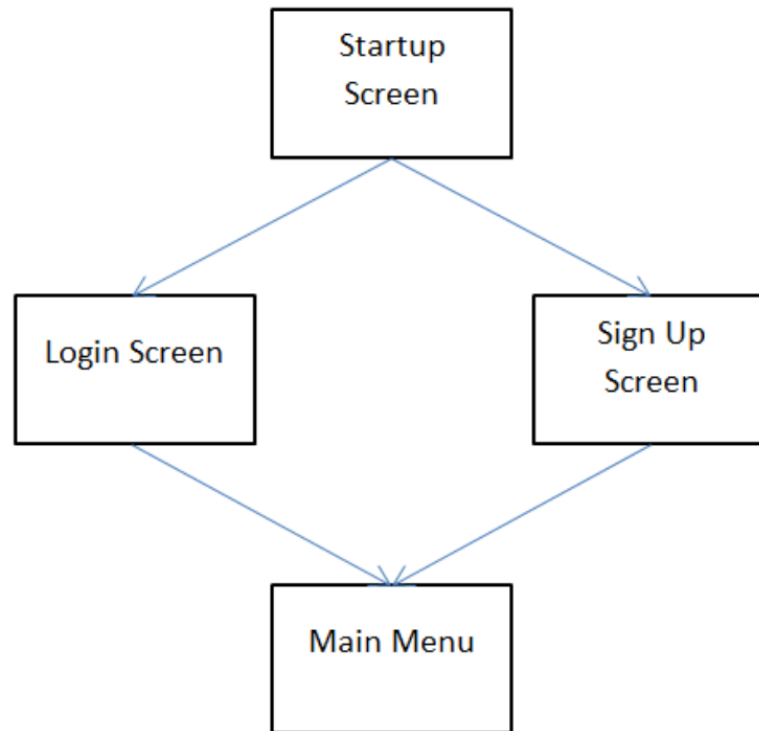
EXISTING PROBLEM

At present, the researchers are showing their great effort in the area of food nutrition. In this section is presenting some of the researchers work that must enlighten our study. A descriptive cross-sectional study has been done among 144 children and they found that in rural areas, parameter Weight-for Height (WHZ) projected that 1.39% of children were severely malnourished, 1.39% moderately malnourished, 22.3% mildly malnourished and had no serious overweight, but in urban areas, 25%, 2.78% and 1.38% mild, moderate and severe overweight respectively.

PROPOSED SOLUTION

After mentioning the problems above, the deliverable of the project is a fitness mobile application called *Digital Fitness Diary for Healthy Lifestyle* in which the users can use the app to keep track of their exercise, food, and water statistics such as calories, distance travelled, nutrients consumed, volume of water intake, and so forth. Meanwhile, tons of information will be available in the mobile application so that the users can be provided with useful as well as helpful tips and tricks about health to make their life healthier than before.

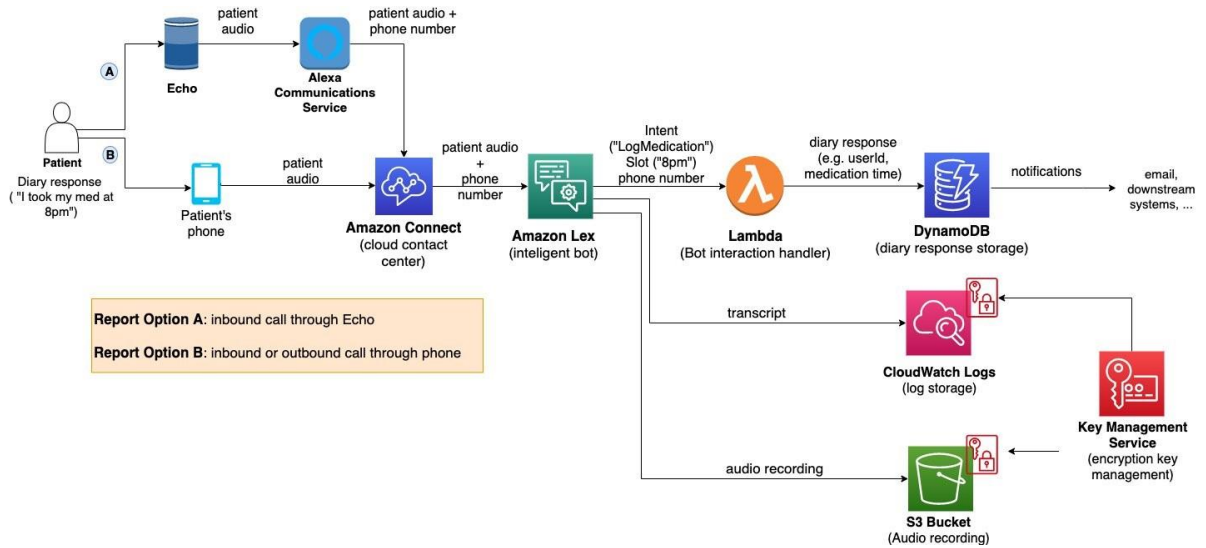
3 THEORITICAL ANALYSIS: BLOCK DIAGRAM



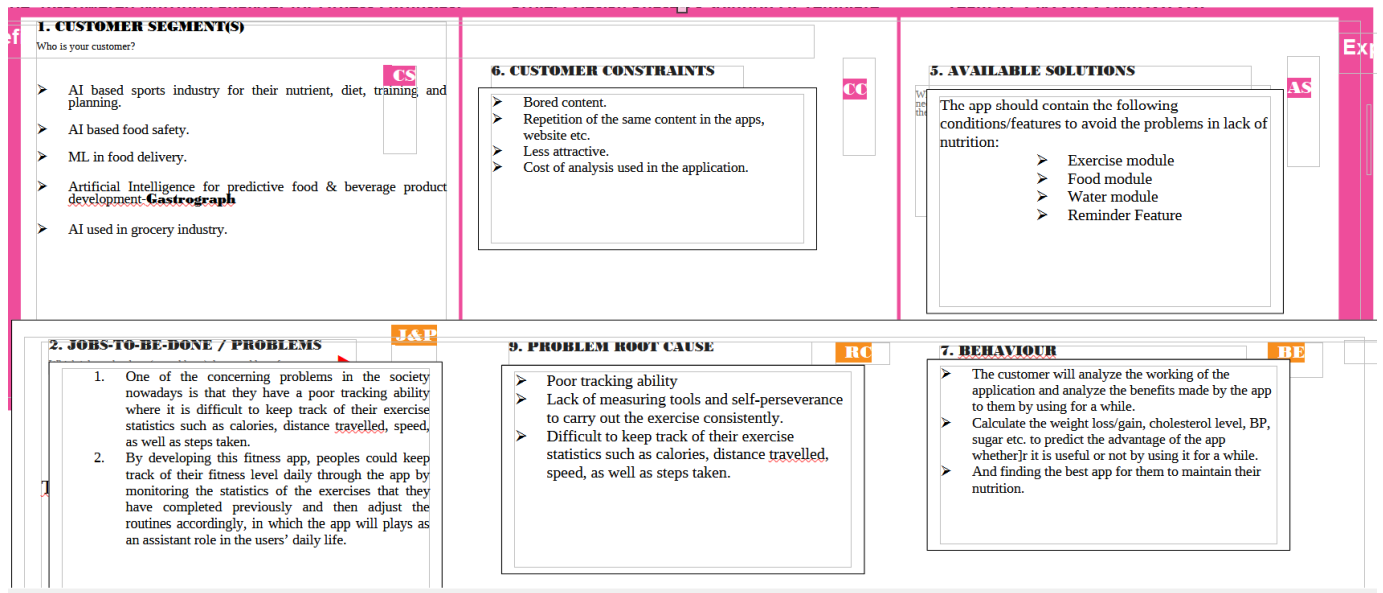
Solution Architecture:

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

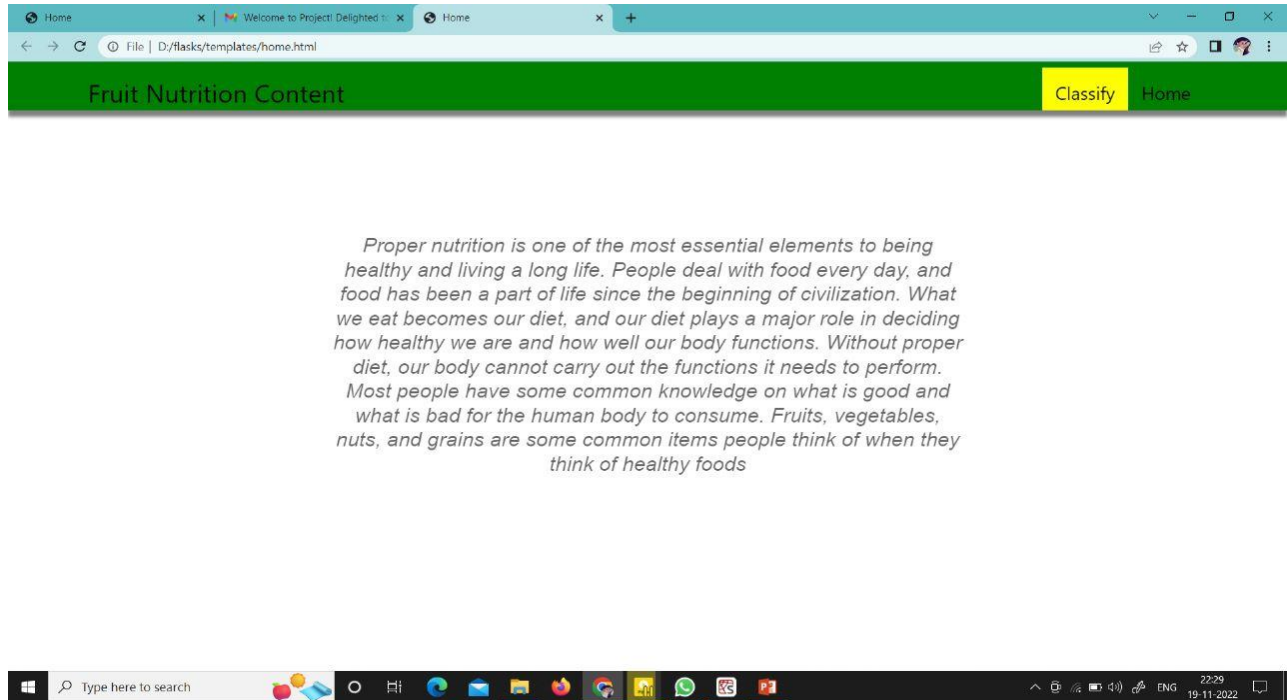
- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution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

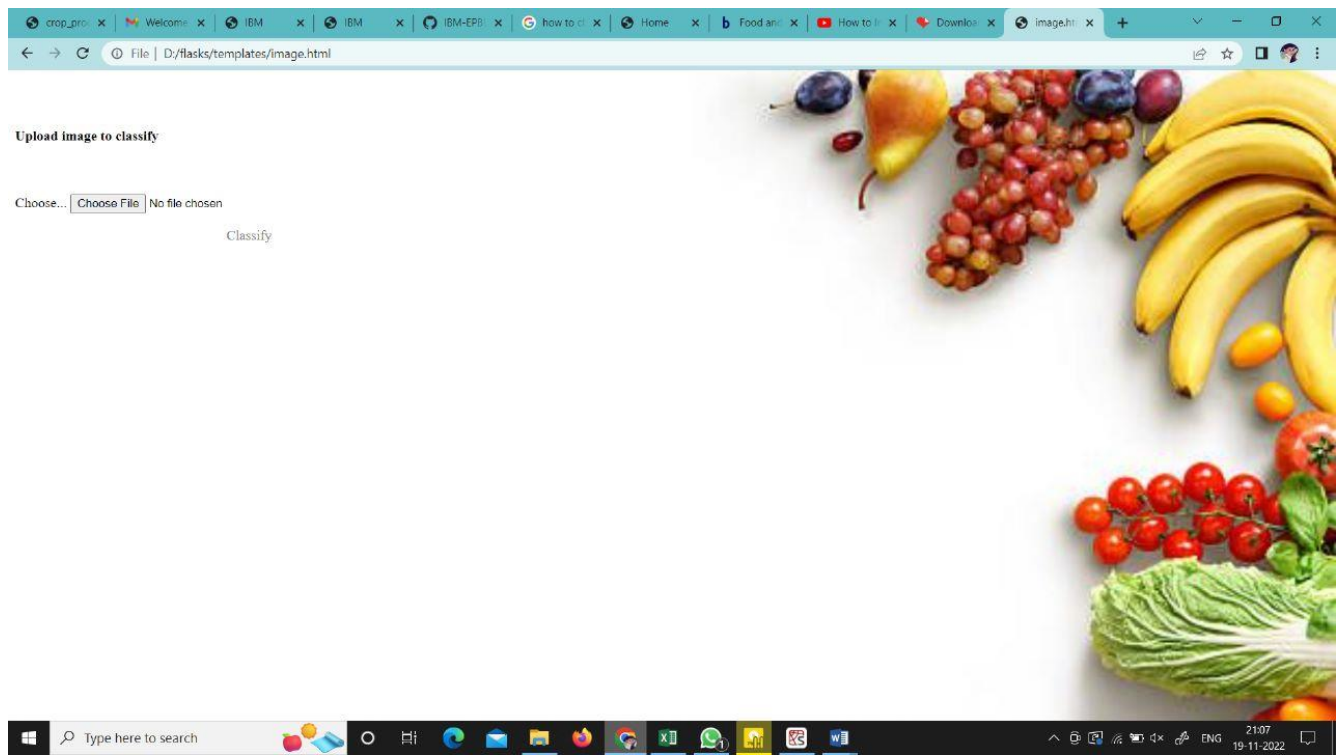
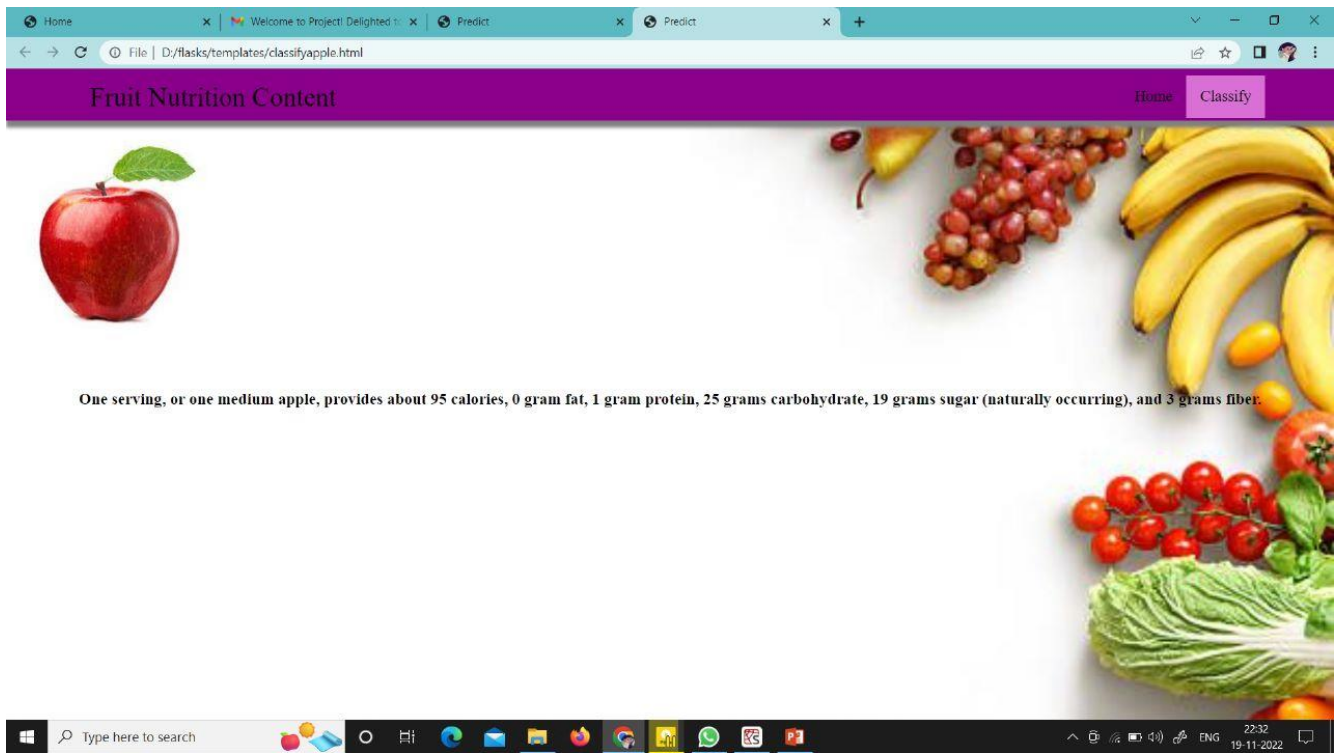


PROBLEM SOLUTION FIT



3.2 Software Interface Design

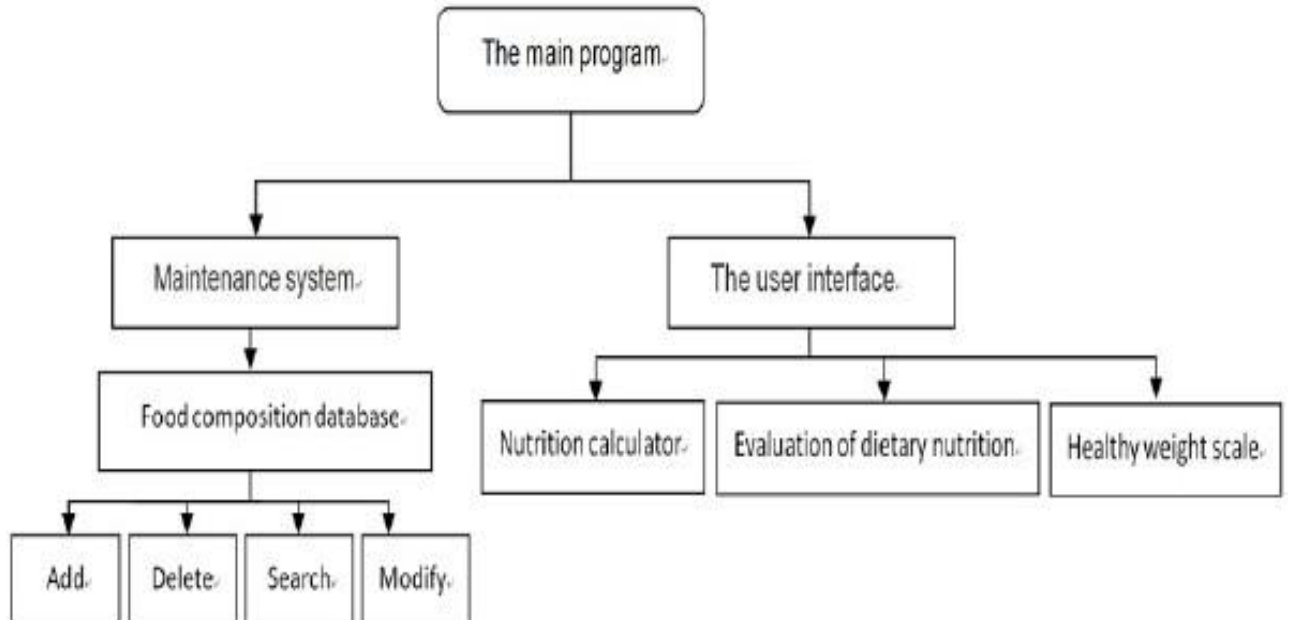




he users click on any one of the article, they will be redirected to another screen to view the article in browser view.

- Besides, the users can navigate from the health feed to the other modules.
- Also, if they wish to log out of the app they could do so by selecting the option in the popup menu at the top right of the screen.

2 FLOWCHART:



3 RESULT:

We have successfully build a web based UI and integrated all the services.

Web Application :

4 ADVANTAGES & DISADVANTAGES:

ADVANTAGES

- Picture of body identifying benefits of healthy eating for adults.
- May help you live longer.
- Keeps skin, teeth, and eyes healthy.
- Monitor Your Diet Easily . You can track your daily activities and maintain a digital food diary at just one click .
- Many health and fitness apps provide health and fitness tips and guidelines, which help individuals in meeting their health goals. You can also get free workout or exercise ideas that help you to plan your workout routine easily.
- Helps you to meet your step count target by giving you all the information you need. Monitoring your steps can improve your daily step count and work more towards achieving your target.
- Fitness apps have made our lives easier and enable you to track your activities on a daily basis. Thus, making you stay focused on your activities and overall fitness.
- Supports muscles.
- Boosts immunity.
- Strengthens bones.
- Lowers risk of heart disease, type 2 diabetes, and some cancers.
- Supports healthy pregnancies and breastfeeding.

DISADVANTAGES:

- They require a lot of energy to track the activity of users. As a result, going out for a jog with a smartphone that counts steps or measures the heart rate through a connection to a wearable device works only with a full battery.
- Few users continue using the fitness apps that fail to measure and calculate routes properly, because these mistakes automatically affect the number of calories burned and many other metrics.
- Fitness Trackers are expensive to buy.
- These unhealthy eating habits can affect our nutrient intake, including energy(or [kilojoules](#)) protein, carbohydrates, essential fatty acids, vitamins and minerals as well as fibre and fluid.
- Being overweight
- Tooth decay
- High blood pressure
- High cholesterol
- Heart disease and stroke
- Type-2 diabetes

5 APPLICATIONS:

- Precision Farming that is farming processes can be made more controlled and accurate.
- Live monitoring can be done of all the processes and the conditions on the agricultural field.
- All the controls can be made just on the click.
- Quality can be maintained.

A. SOURCE CODE

MANC

```
.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); }
}

```

Main.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;
}
}

```

Style.css

```

$(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!');
  },
});
});
});

```

Main.js

```

<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&display=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>
v>
</body>
</html>

```

0.html

```

<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-
scale=1.0">
<meta http-equiv="X-UA-Compatible" content="ie=edge">

```

```

<title>Home</title>
<link
href="https://cdn.bootcss.com/bootstrap/4.0.0/css/bootstrap.min.cs
s" 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://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">
```

[illegible]

of food. It ensures compliance with trade and food laws.</h3>

</center>

</h1>

</body>

</html>

Home.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 %}

```

Image.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.cs
s" 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/be211ad5043a8d0575
7a3538bdd8f450.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>

</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>

Imageprediction. Html

-- coding: utf-8 --

"""

Created on Fri Nov 4 14:19:28 2022

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"""

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 lanuch():
    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=['APPLE','BANANA','ORANGE','PINEAPPLE','WATER
MELON']

result=str(index[pred[0]])
print(result)
x=result
result=nutrition(result)
print(result)

return
render_template("0.html",showcase=(result),showcase1=(x))
def nutrition(index):

import requests

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

querystring = {"query":index}

headers = {
    "X-RapidAPI-Key":

```

```
"85887549f4msh51e7315b280a87ep1f43e0jsn585c940f2ea6",  
"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)
```

Solution and Testing .

6 CONCLUSION:

As a matter of fact, some of the modern citizens nowadays have no clues about how to exercise properly and find it difficult to keep track of their exercise progress due to various reasons such as lack of information as well as knowledge. It is also worth mentioning that they have a job too, as if it is not stressful enough to balance their work and healthy lives. Apparently, loss of motivation is also one of the major problems that people often give up on doing exercise consistently. That means people will feel boring as they cannot be motivated anymore unless there is something motivational which re-motivate them to put in more efforts. With that being said, only people who are somewhat determined and diligent can keep their head up in order to stay healthy without needing the assistance of a fitness app.

Therefore, the deliverable of this project called *Fruit Nutrition Content* is going to address all these problems mentioned above by introducing a few functions that can aid the users while they are exercising so that they have nothing to worry about from now on. First and foremost, the users can carry out different exercises while keeping track of the real time statistics such as location, distance travelled, and time elapsed in the Exercise section. After all this has been done, the users can view the amount of calories and weight in an organized view so that they could compare the changes side by side. For the sake of motivation, a leaderboard will also be added in as an element of gamification where the users' can compete with each other in terms of points earned as well as ranks.

7. FUTURE SCOPE

The project can be improved through these ideas in the future:

1. QR code scanning feature in Food module which could allow the users to scan the nutrition labels on the products and obtain the nutrition facts immediately.

2. Virtual personal trainer which could assist the users in practicing a healthy lifestyle through intelligent voice narration.
3. Message function which could allow the users to chat with their friends.
4. More social network sites could be integrated into the app in order to improve connectivity between users from different platforms.