AI-POWERED NUTRICIAN ANALYZER FOR FITNESS ENTHUSIASTS

Project Report

Submitted by:

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INTRODUCTION:

In the current age, people are more conscious about their food and diet to avoid either upcoming or existing diseases. Since people are dependent on smart technologies, provision of an application to automatically monitor the individuals diet, helps in many aspects. It increases the awareness of people in their food habits and diet. Over the last two decades, research has been focused on automatically recognizing the food and their nutritional information from images captured using computer

vision and machine learning techniques. In order to properly assess dietary intake, accurate estimation of calorie value of food is of paramount importance. A majority of the people are overeating and not being active enough. Given how busy and stressed people are today, it's effort less to forget to keep track of the food that they eat. This only increases the importance of proper classification of food. As it is frequently said, "we eat with our eyes". With the continued proliferation of social media platforms such as Instagram (now at 500 million daily active users) as avenues for experience sharing and marketing, our digital experience becomes more and more photo-driven, and of these, over 360 million photos are photos of food. Food images almost single-handedly drive dining experiences, food festivals, cooking classes, and the rise of gastro-tourism, with over 88% of respondents in a 2015 survey considering food to be the defining element in selecting travel destinations. Most of these photos may be associated with a location or a tag, but are otherwise unlabeled, making the food search experience largely disorganized and difficult to navigate. This project explores food image classification with convolutional neural networks (CNNs) for better image labeling and clustering by dish, which in turn may improve the recommendation and search flows for a better digital food user experience overall. Specifically, the goal of the project is to, given an image of a dish as the input to the model, output the correct label categorization of the food image. Food image recognition and calorie estimation can aid in diet management, food blogging and recognizing the Indian foods.

OVERVIEW:

The process of identifying food items from an image is quite an interesting field with various applications. Since food monitoring plays a leading role in health-related problems, it is becoming more essential in our day-to-day lives. In this paper, an approach has been presented to classify images of food using convolutional neural networks. Unlike the traditional artificial neural networks, convolutional neural networks have the capability of estimating the score function directly from image pixels. A 2D convolution layer has been utilized which creates a convolution kernel that is convolved

with the layer input to produce a tensor of outputs. There are multiple such layers, and the outputs are concatenated at parts to form the final tensor of outputs. We also use the Max-Pooling function for the data, and the features extracted from this function are used to train the network. An accuracy of 86.97% for the classes of the FOOD-101 dataset is recognized using the proposed implementation.

PURPOSE

:

1.Removal of unwanted matter
2.Making food safe for consumption
3.Increasing digestibility
4.Minimizing nutrient loss
5.Increasing acceptability through fabricated food.

LITERATURE SURVEY:

Food image classification is an emerging research field due to its increasing benefits in the health and medical sectors. For sure, in the future automated food monitoring systems, calories estimation and so on. In this paper, automated methods of food classification using deep learning approaches are presented. Squeeze Net and VGG-16 Convolution Neural Networks are used for food image classification. It is demonstrated that using data augmentation and by fine-tuning the hyper parameters, these networks exhibited much better performance, making these networks suitable for practical applications in health and medical fields. Squeeze Net being a lightweight network, is easier to deploy and often more desirable. Even with fewer parameters, Squeeze Net is able to achieve quitea good accuracy of 77.20%. Higher accuracy of food image classification is further achieved by extracting complex features of food images. The performance of automatic food image classification is further improved by the proposed VGG-16 network. Due to increased network depth, proposed VGG-16 has achieved significant improvement in accuracy up to 85.07%.

2. Food Recognition based on Deep Learning Algorithms.
Anis Nasuha Mohd Zulfikri(IEEE-2022)

Accurate methods can help the technology nowadays to keep improving and provide a reliable system for the people to use. In this paper, two different image classification systems; Convolutional Neural Network (CNN) and Residual Neural Network (ResNet) were proposed in order to recognize six food classes; Apple, Orange, Avocado, Milo, Vico and Koko based on color features. Then, the overall performance for both classifications were analyzed in the end of this paper. Datasets of food images were collected from various sources consisting 400 images for each food classes to test the robustness of each classification system. The data were split into 60%

training data, 20% validation data and 20% testing data. The system that is proposed in this paper consist of 4 layers for Convolutional Neural Network (CNN) while Residual Neural Network (ResNet) consist of 50 layers. The color feature extraction that is involved for both classifications, RGB values (Red, Green, Blue) are highly considered in order to determine the category of the food. Overall, this experimental results on food recognition showed 100% training accuracy and 98.67% overall testing accuracy for CNN while 99.87% training accuracy and 96.67% overall testing accuracy for ResNet.

3. Nutrient Food Prediction Through Deep Learning.
Saikat Banerjee(IEEE-2021)

The lifespan of a man can be sustained only with adequate nourishment. To lead a productive, healthy life, human needs nutritious food. In this pandemic COVID-19 situation humans need more nutritious food for combating infectious disease along with a strong immune system in ourbody. Nutritious foods recognition is one of the major tasks for a customer. In large stores plenty of agricultural products are stored, then there needs a classification for separating normal food and nutritious food. The real time decision will alert the consumer by predicting nutritious foods. By the use of deep learning, it may be possible to classify nutritious food along with their nutrient content and give the possible particular rating view image through the deep learning method. Enormous development in deep learning is possible due to the advancement of the Convolutional Neural Network (CNN) algorithms. CNN is a modern technique inspired by biological neurons mainly used for image processing and data analysis, producing encouraging results. The principal objective of our work is to detect and segregate normal food and nutritious food. This is accomplished using the combination of both nutrition and image Classification techniques. Hence, the proposed system achieved average overall accuracy is more than 91%.

4. Food Classification and Recommendation for Health and Diet Tracking using Machine Learning. Dr.Manjula.

Many researchers have been published recently on food classification and recommendation separately, but combination of food classification and recommendation using deep learning is rare. The CNN algorithm is presented in this work because it is higher accuracy than other algorithms. In the present generation people are very concerned about their food habits in order to maintain their healthy balanced diet. This paper classifies Indian food images. The model/system uses a deep leaning process to train the machine. For this project the dataset is collected from Kaggle, UCI and some

of the images from Google chrome, which contains 1000 images. The dataset is classified into 12 classes namely biryani, bisibelebath, butter naan, chats, chapatti, Dhokla, dosa, idly, noodles, upma, poori, samosa. On a different set of tests, the average accuracy is 86.33 percent. This paper also contributes to diabetic patients and also recommends the healthy note.

EXISTING PROBLEM:

In the Existing system there are limits in assessing healthy and abnormal swallowing by Video fluoroscopic swallowing study.
Classification of accelero metric swallowing signals is much more efficient method to judge healthy swallowing. However, these methods have developed mostly with dual axis accelerometer signals and classifying two-class problems. This study is to examine classification methods with multi- class three-axis accelero metric signals. Swallowing signals of five foods are classified with both supervised learning algorithm and unsupervised learning algorithm. Three-axis signals noised by 10-level discrete wavelet transform with soft threshold before feature calculation. The result confirmed that classification with support vector machine and K-nearest neighbor can predict with 90% accuracy. However, Classification with fuzzy c-mean clustering produce low purity and normalized mutual information.

REÏERENCES:

S.No	Title	Author	Year	Inference
1	Machine Learning and AI for healthcare	Arjun Panesar	2019	❖ The world is changing.There are more phones than peoples in the world ❖ The success of many of the world's most loved services from google to Uber,Alexa to Netflixis grounded in big data. ❖ At the same time the world's population is living longer and unhealthier than ever and in a financial crisis. ❖ Digital health has always had an important role in healthcare

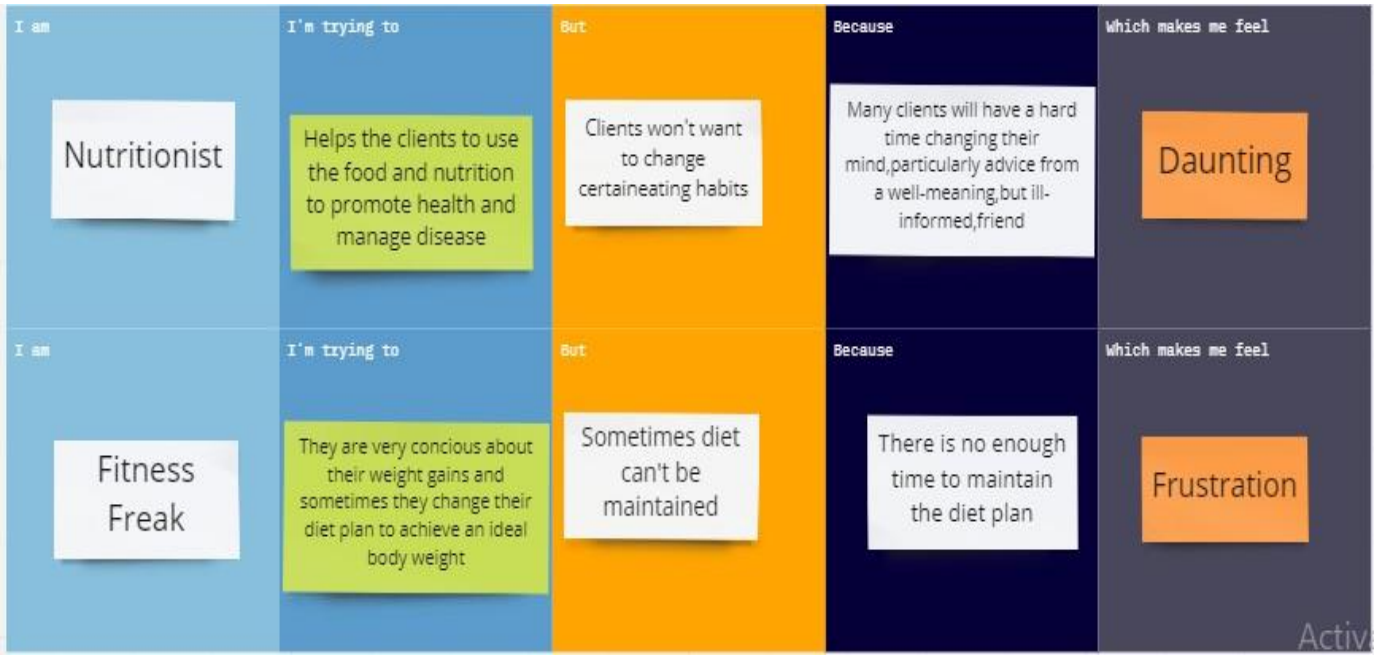
2	AI based Yoga Trainer- Simplifying home yoga using mediapipe and video streaming	1.Vedangi Agarwal 2.Konark Sharma 3.Abha Kiran Rajpoot	2022	❖ COVID-19 has induced the need of exercises and yoga among people. ❖ Yoga is now becoming a habit of everyone for staying fit and healthy through body and mind ❖ Since,it was the period of complete lockdown people

				started preferring online modes for thesame ❖ The integration of AI in the fitness industry is going huge momentum among the health conscious. ❖ This paper walks through different yoga mobile application that use the techniques of artificial intelligence to motivate their customers with personalized experience and positive feedback and introduce a new concept ofAI based yoga trainer.
3	Rethinking technologies acceptance inthe age of emotional AI	1.Manh-Tung Ho 2.Peter Mantello 3.Nader Ghotbi 4.Minh-Hoang Nguyen 5.Hong-Kong T Nguyen 6.Quan-Hoang Vuong	2022	❖ This paper examines technological acceptance for automated emotion-sensing devices and non-conscious data collection(NCDC). ❖ We argue that conventional 20th century scholarship of human-machine relations is ill-equipped in the age of intelligent machines that sense,monitor,and track human sentiment,emotion and feeling. ❖ We conduct a regression analysis on a dataset of 1015 Generation Z student respondents from 48 countries and 8 regions worldwide using the Bayesian Hamiltonian Monte Carlo approach.

4	The rise of artificial intelligence under the lens of sustainability	1.Jayden Khakurel 2.Bigrit Penzenstadler 3.Jari Porras 4.Antti Knutas 5.Wenlu Zhang	2018	❖ Since the 1950's artificial intelligence has been a recurring topic in research. ❖ However this field has only recently gained significant momentum because of the advances in technology and algorithms. ❖ Although companies are eager to join the fray of this new AI trend and take advantage of its potential benefits. ❖ Using the five dementions of sustainability to structure the analysis we explore the impacts of AI on several domains ❖ We find that there is a significant impact on all five dimensions with positive and negative impacts and the value of collaborations.
5	Adapting a nutrition chatbot to the user's nutrition and food literacy	Evangelia Giannikou	2022	❖ Eating healthy is crucial to maintaining good health and avoiding diseases. ❖ Within the technology fields many nutrition applications and chatbots have been developed to promote healthy eating ❖ In our study, we assessed the nutrition and foodliteracy of the userwith the nutrition literacy scale and developed a nutrition chatbot. ❖ The adaptive group was identified with a

				higher interest in nutrition than the non-adaptive leading to lower satisfaction because of higher expectations gains chatbot. ❖ Due to the limitation of our study we also propose repetition of the experiment with a more diverse sample in NEFL and a different NEFL assessment tool

PROBLEM STATEMENT:

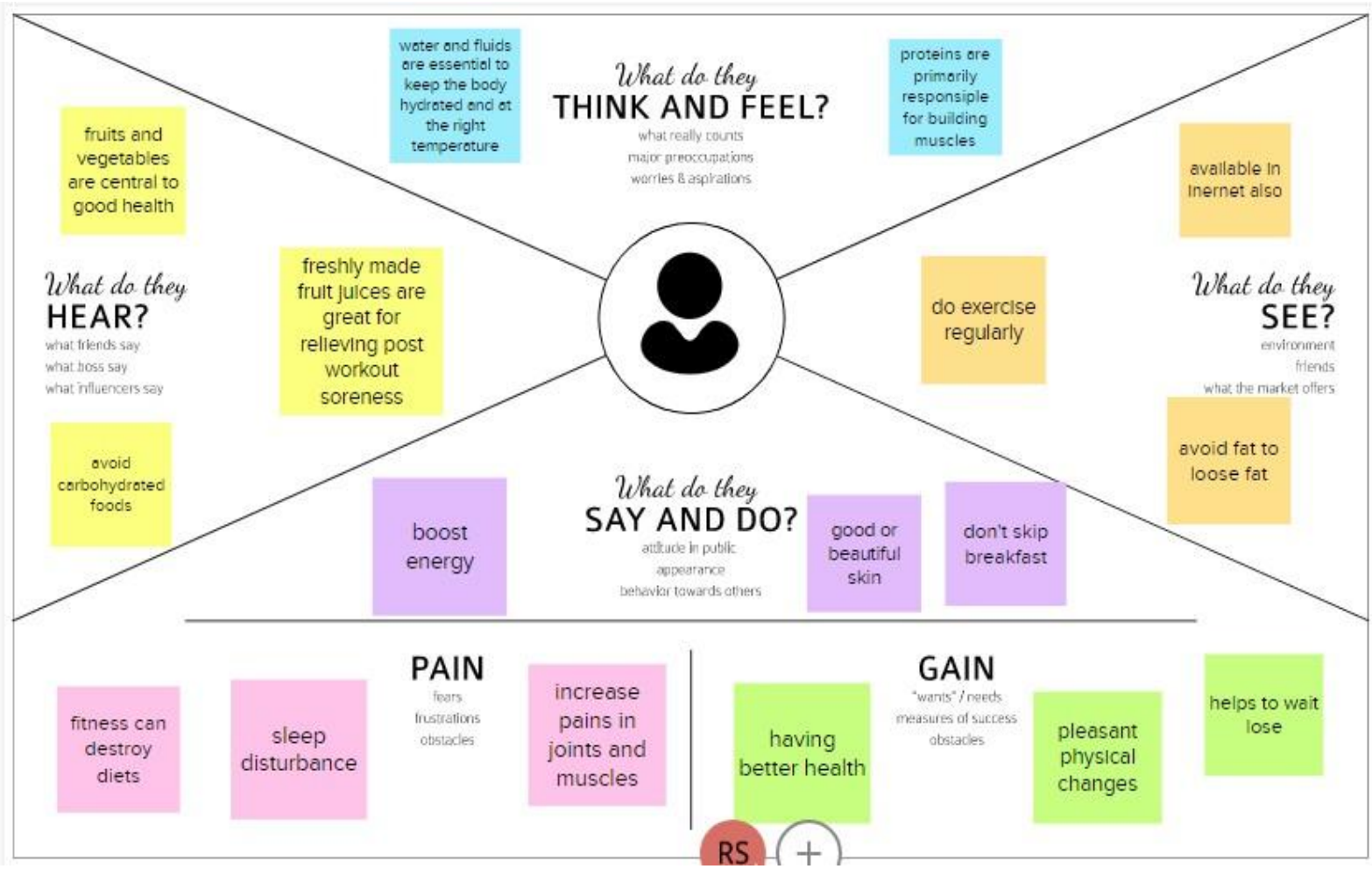


IDEATION & PROPOSED SOLUTION:

EMPATHY MAP CANVAS:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

EXAMPLE:



PROPOSED SOLUTION:

S.NO	Parameter	Description
1.	Problem Statement(Problem to be solved)	The specific nutrition problem that you are the dietition
2.	Idea/Solution description	If your appetite and taste have been affected by illness
3.	Novelty/Uniqueness	These constructs in health promotion to illness
4.	Social Impact/ Customer Satisfaction	Visualization of food appearance
5.	Business Model (Revenue Model)	Business model are the operational and transaction
6.	Scalability of the Solution	Malnutrition is a global health crisis

PROPOSED SOLUTION FIT:

Define CS, fit into CC

Focus on J&P, tap into BE, understand RC

1. CUSTOMER SEGMENT(S)

Who is your customer?
i.e. working parents of 0-5 y.o. kids

People who want to fit their body and maintain proper or balanced diet in a proper way

6. CUSTOMER CONSTRAINTS

What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.

Constraints may contribute to the unhealthy food choices observed among low socio-economic groups in industrial countries

5. AVAILABLE

Which solutions are
problem
or need to get the jo
cons do these soluti
notetaking

**Try to eat
sugar.**

**Ask your d
supplemen**

Avoid non-

2. JOBS-TO-BE-DONE / PROBLEMS

J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

Being a holistic wellness coach, registered dietitian nutritionist. Food scientists, nutrition educator are the job can successfully done

in this field

9. PROBLEM ROOT CAUSE

What is the real reason that this problem exists?
What is the back story behind the need to do
this job?
i.e. customers have to do it because of the change in regulations.

Lack of appetite, or decreased hunger

A sore mouth or throat can make eating difficult

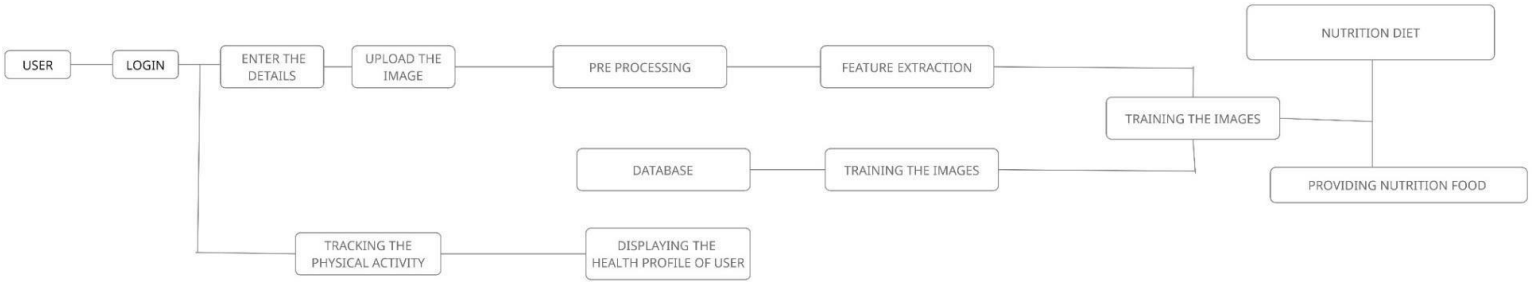
Un diet plan in un time eating

7. BEHAVIOUR

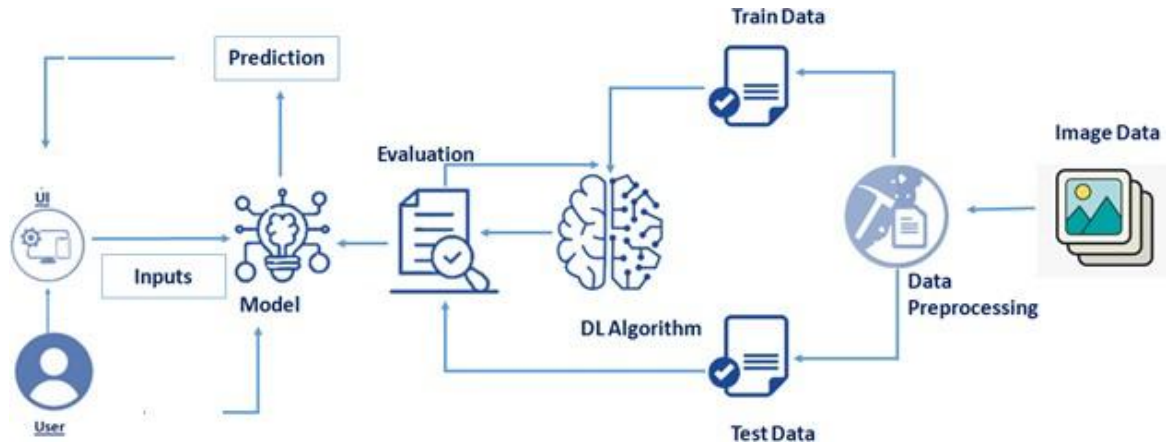
What does your cust
done?
i.e. directly related: f
indirectly associated
Greenpeace)

**The sum
habitual
groups t
food as v
storage a**

PROJECT DESIGN:
DATA FLOW DIAGRAMS:



TECHNICAL ARCHITECHTURE:



SOFTWARE REQUIREMENTS

HARDWARE SPECIFICATION

System	:	PC OR LAPTOP
Processor	:	INTEL I5
RAM	:	4 GB Recommended
ROM	:	2 GB
FRONT END	:	PYTHON SHELL
BACKEND	:	PYTHON SCRIPT WINDOW
LAPTOP	:	CAMERA

SOFTWARE SPECIFICATION

OPERATING SYSTEM	:	WINDOWS 7/10/11
LANGUAGE USED	:	PYTHON

PYTHON

```
from flask import Flask, render_template, request, url_for, redirect

from werkzeug.utils import secure_filename

from werkzeug.exceptions import HTTPException

import os

import json



UPLOAD_FOLDER = 'static/uploads/'
app = Flask(  name   , static_url_path='/')



app.config['UPLOAD_FOLDER'] = UPLOAD_FOLDER
my_secret = os.environ['apikey']



def demo_cal(num):
                                if int(num)==1:

                                                data_load =
                                        "testdata2burger.json"
                                else:

                                   data_load= "testdata.json"

                                with open(data_load, "r") as f:

                                   data = json.load(f)

                                return data



def get_cal(fname):
                                  try:

                                  img = f"static/uploads/{fname}"

                                   api_user_token = my_secret
```

```
headers = {'Authorization': 'Bearer ' + api_user_token}

# Single/Several Dishes Detection
```

4. REQUIREMENT ANALYSIS

Functional Requirements:

Following are the functional requirements of the proposed solution.

S.NO	Functional Requirements(Epic)	Sub Requirements(Story/ Sub-Task)
1	User Registration	Registration through Form. Registration through Gmail. Registration through LinkedIN.
2	User Confirmation	Confirmation via Email. Confirmation via OTP.
3	Data Input	Getting the person information.
4	Data Processing	Upload the data and classify it.
5	Data Classification	Identify the person's information.
6	Data Description	Suggesting the diet plans.

Solution Requirements (Functional & Non- Functional)

Non-Functional Requirements:

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

S.NO	Non-Functional Requirements	Description
1	Usability	Datasets of all the food and nutrition used to detection the diet plans.
2	Security	User and Data.
3	Reliability	The food quality and predicting the nutrition.
4	Performance	The performance is based on the quality of the food used for nutrition.
5	Availability	It is available for all user to predict the diet plan.
6	Scalability	Increasing the diet plan and nutrition.

Solution Requirements (Functional & Non- Functional)

5. PROJECT PLANNING & SCHEDULING

form.html

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
  <head>
    <meta charset="utf-8">
    <title>Login</title>
    <link rel="stylesheet" href="style.css">
    <style>
@import
url('https://fonts.googleapis.com/css2?family=Noto+Sans:wght@700&family=Poppins:wght@400;500;600&di
splay=swap');
*{
```

```
  margin: 0;
  padding: 0;
  box-sizing: border-box;
  font-family: "Poppins", sans-serif;
}
body{
  margin: 0;
  padding: 0;
  background: linear-gradient(120deg, #d7a4ed, #8e44ad);height:
  100vh;
  overflow: hidden;
}
.center{
  position: absolute;
  top: 50%;
```

Solution Requirements (Functional & Non- Functional)

left: 50%;

```
  transform: translate(-50%, -50%);

  width: 400px;

  background: white;

  border-radius: 10px;

  box-shadow: 10px 10px 15px rgba(0,0,0,0.05);

}

.center h1{

  text-align: center;
  padding: 20px 0;

  border-bottom: 1px solid

silver; }

.center form{

  padding: 0 40px;

  box-sizing: border-box;

}
```

Solution Requirements (Functional & Non- Functional)

form .txt_field{

```
  position: relative;

  border-bottom: 2px solid

  #adadad; margin: 30px 0;

}

.txt_field input{

  width: 100%;
  padding: 0 5px;

  height: 40px;

  font-size: 16px;

  border: none;

  background: none;

  outline: none;

}

.txt_field label{

  position: absolute;
```

Solution Requirements (Functional & Non- Functional)

top: 50%;

```
  left: 5px;
  color: #adadad;
  transform: translateY(-50%);
  font-size: 16px;
  pointer-events:
  none; transition: .5s;
}
.txt_field span::before{
  content: '';
  position: absolute;
  top: 40px;
  left: 0;
  width: 0%;
  height: 2px;
```

Solution Requirements (Functional & Non- Functional)

background: #8e44ad;

```
  transition: .5s;

}

.txt_field input:focus ~ label,
.txt_field input:valid ~ label{

  top: -5px;

  color: #8e44ad;

}

.txt_field input:focus ~ span::before,

.txt_field input:valid ~span::before{

width: 100%;

}

.pass{

  margin: -5px 0 20px 5px;

  color: #a6a6a6;

  cursor: pointer;
```

}

```
.pass:hover{
  text-decoration: underline;

}

input[type="submit"]

  {width: 100%;

  height: 50px;

   border: 1px solid;

   background: #8e44ad;

  border-radius: 25px;

  font-size: 18px;

  color: #e9f4fb;

  font-weight: 700;

  cursor: pointer;

  outline: none;
```

```
}
input[type="submit"]:hover{
```

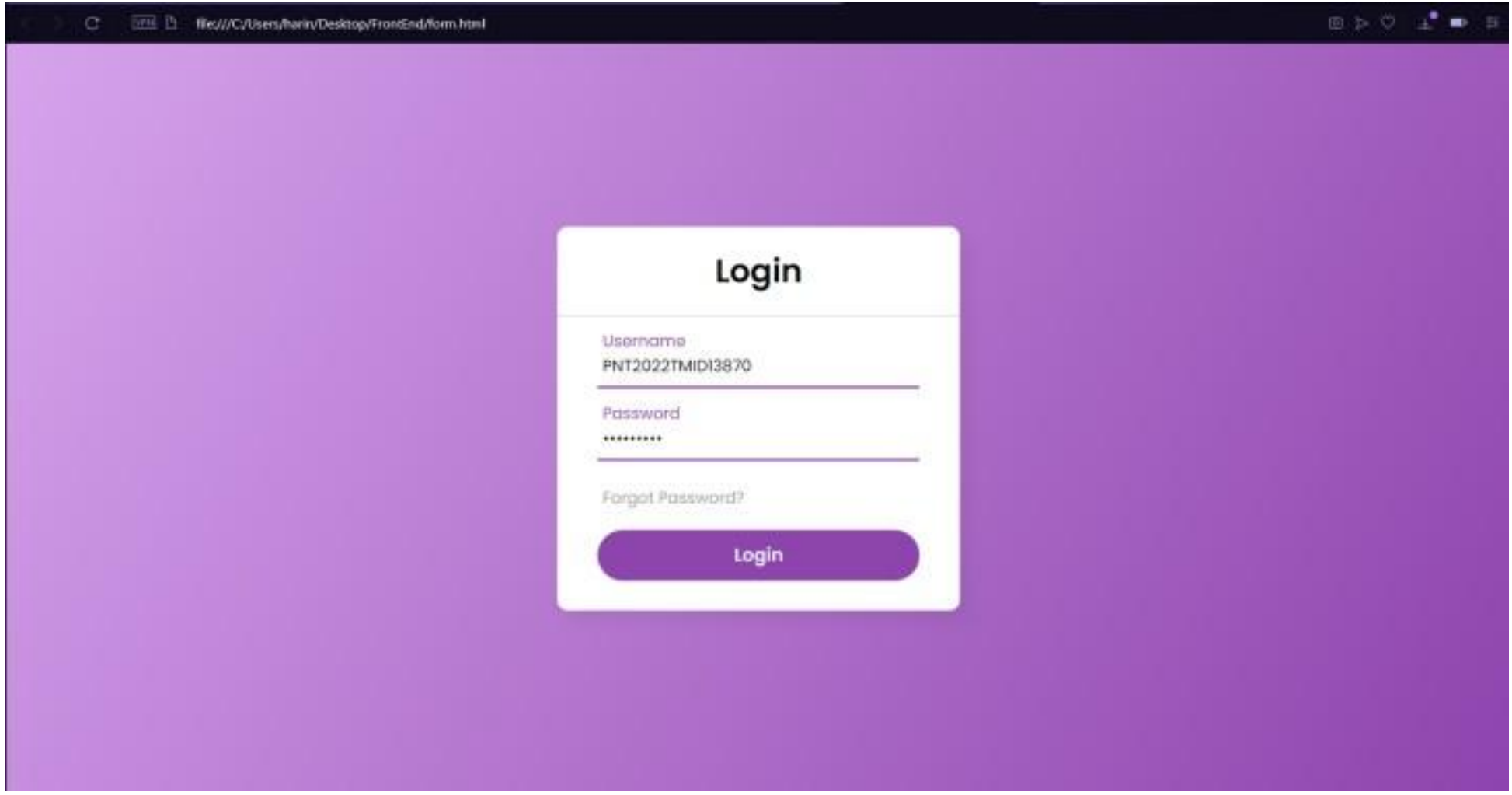
```
  border-color: #8e44ad;
  transition: .5s;
}
.signup_link{
  margin: 30px 0;
  text-align: center;
  font-size: 16px;
  color: #666666;
}
.signup_link a{
  color: #8e44ad;
  text-decoration: none;
}
.signup_link a:hover{
  text-decoration: underline;
```

```
}


    </style>
  </head>
  <body>
    <div class="center">
      <h1>Login</h1>
      <form method="post">
        <div class="txt_field">
          <input type="text" required>
          <span></span>
          <label>Username</label>
        </div>
        <div class="txt_field">
          <input type="password" required>
```

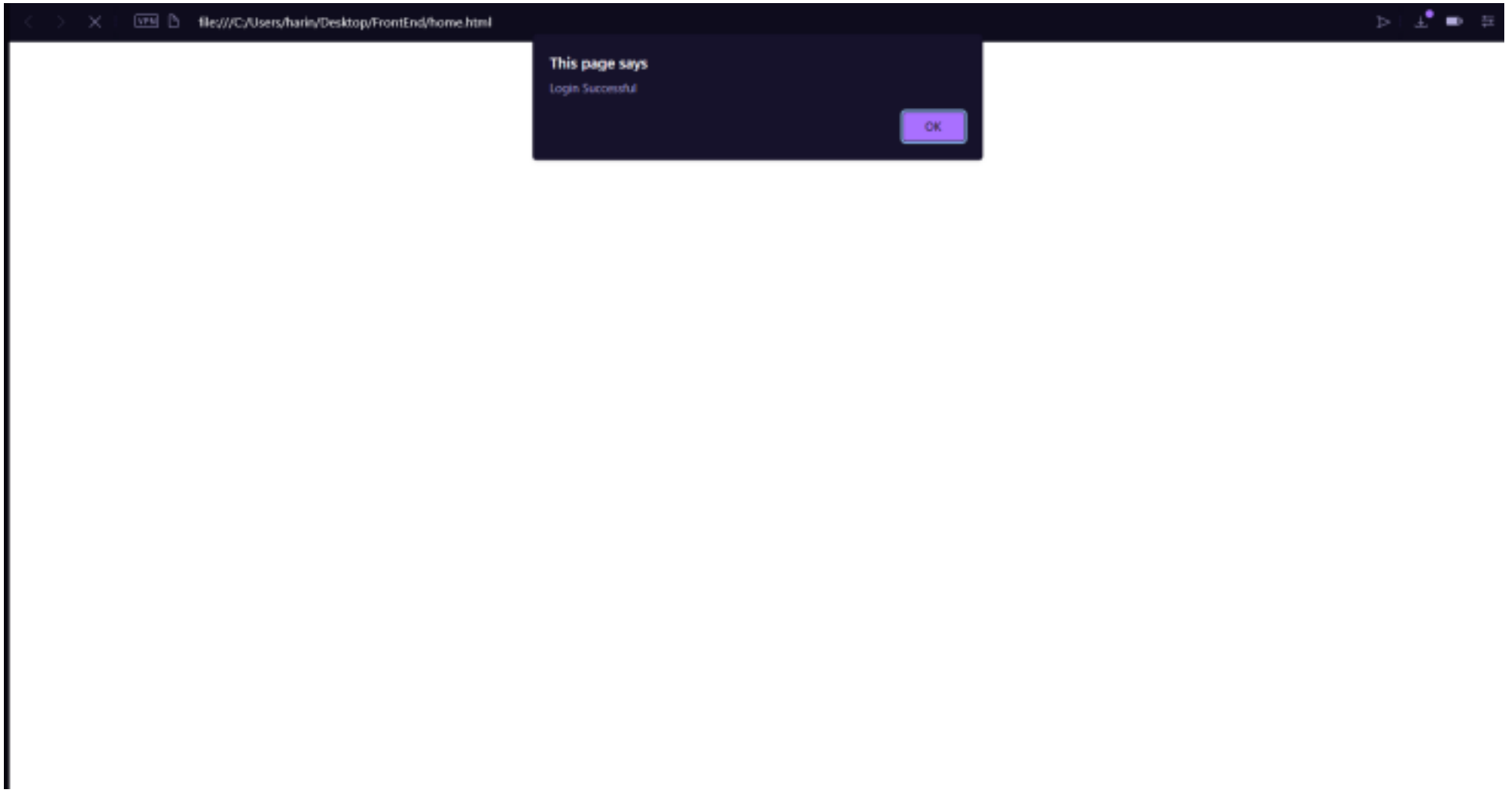
Solution Requirements (Functional & Non- Functional)

```
        <label>Password</label>
      </div>
      <div class="pass">Forgot Password?</div>
      <input type="submit" value="Login"> <div
      class="signup_link">
      </div>
    </form>
  </div>
 </body>
</html>
```

Solution Requirements (Functional & Non- Functional)



Solution Requirements (Functional & Non- Functional)



home.html

```
<!DOCTYPE html>

<html lang="en">

<head>
```

Solution Requirements (Functional & Non- Functional)

<meta charset="UTF-8">

Solution Requirements (Functional & Non- Functional)

```
<meta http-equiv="X-UA-Compatible" content="IE=edge"> <meta
name="viewport" content="width=device-width, initial-scale=1.0">
<style>
    body{
margin: 0;
position: absolute;
top: 50%;
left: 50%;
-ms-transform: translate(-50%, -50%);
transform: translate(-50%, -50%);
text-align: center;
background-image:
url(home3.jpg);
background-position: center;
background-repeat: no-repeat;
```

background-attachment: fixed;

```
  text-transform: capitalize;

  color: aliceblue;



}

a{

    text-decoration: none;

    cursor: pointer;

    color: rgb(3, 7, 11);

    border: 2px black solid;
    padding: 5px;

    border-radius: 3px;

    background-color: #fff;

}

    </style>>

    <title>Home</title>
```

Solution Requirements (Functional & Non- Functional)

</head>

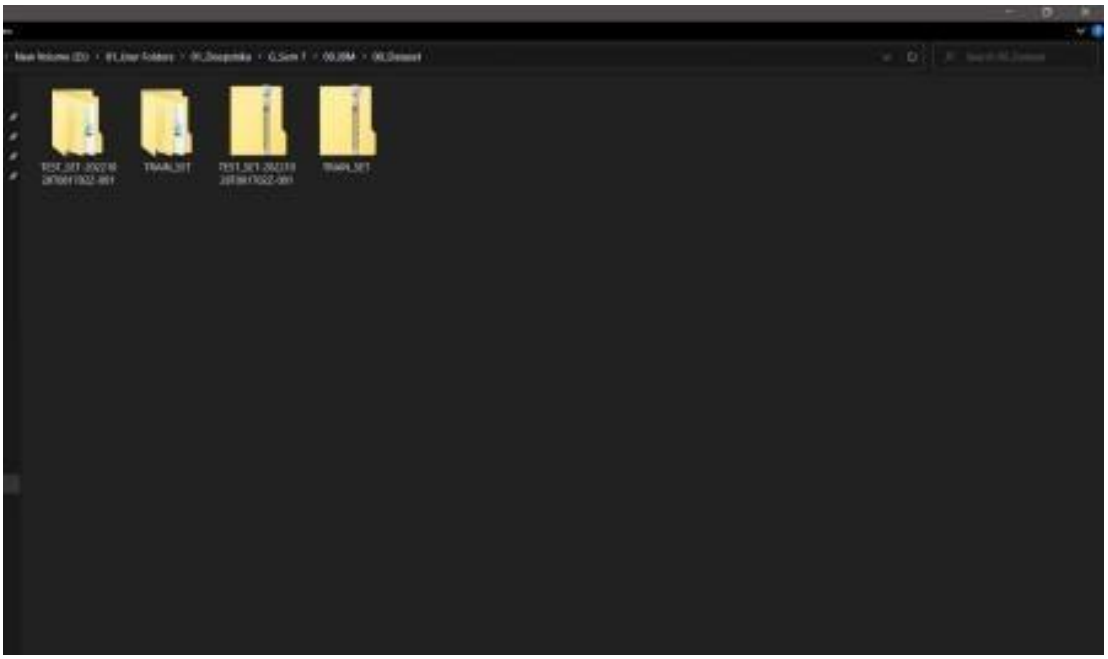
Solution Requirements (Functional & Non- Functional)

```
<body>

    <h2>AI-Powered Nutrition Analyser for Fitness Enthusiasts</h2>

    <h4>Team ID: PNT2022TMID13870</h3>

    <br><br>

    <h3>“To ensure good health: eat lightly, breathe deeply, live moderately, cultivate cheerfulness and maintain aninterest in
life.” – William Londen</h3>

    <br><br><br>
    <a href="image.html">Know what you eat</a>

</body>

</html>
```

CODING & SOLUTIONING (Explain the features added in the project along with code)

In this step, the images of diff erent food items are downloaded and organized into subdirectories based on the names of the items. In this project, 5 types of fruits are being used namely apples, bananas, oranges, pineapple, and watermelon. They each have their own subdirectory as a part of the dataset.

Downloading Dataset



TESTING

PURPOSE OF DOCUMENTATION:
The purpose of this document is to briefly explain the test coverage and open issues of
the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

DEFECT ANALYSIS:
This report shows the number of resolved or closed bugs at each severity level, and how
they were resolved.

Resolution Severity
1

Severity
2

Severity
3

Severity
4

Subtotal
By Design 15 0 2 0 17
Duplicate 0 0 0 0 0
External 0 3 0 1 4
Fixed 10 0 1 0 11
Not Reproduced 0 0 1 0 1
Skipped 0 0 0 1 1
Won't Fix 0 1 0 1 2
Totals 25 4 4 3 36

TEST CASE ANALYSIS:
This report shows the number of test cases that have passed, failed, and untested

Section Total Cases Not Tested Fail Pass
Client Application 10 0 2 8
Security 2 0 0 2
Exception Reporting 8 0 2 6
Final Report Output 4 0 1 3
Version Control 1 0 0 1

IDLE

The easiest introduction to Python is through IDLE, a Python development environment. Open IDLE from the Desktop or applications menu:

IDLE gives you a REPL (Read-Evaluate-Print-Loop) which is a prompt you can enter Python commands in to. As it's a REPL you even get the output of commands printed to the screen without using print.

```
>>> 1 + 2
3
>>>name = "Sarah"
>>> "Hello " + name
'Hello Sarah'
```

IDLE also has syntax highlighting built in and some support for auto completion. You can look back on the history of the commands you've entered in the REPL with Alt + P (previous) and Alt + N (next).

BASIC PYTHON USAGE

Hello world in Python:

```
print("Hello world")
```

Simple as that!

INDENTATION

Some languages use curly braces { and } to wrap around lines of code which belong together, and leave it to the writer to indent these lines to appear visually nested. However, Python does not use curly braces but instead requires indentation for nesting. For example a for loop in Python:

```
fori in range(10):
print("Hello")
```

The indentation is necessary here. A second line indented would be a part of the loop, and a second line not indented would be outside of the loop. For example:

```
fori in range(2):
print("A")
print("B")
```

would print:

```
A
B
A
B
```

whereas the following:

```
fori in range(2):
print("A")
print("B")
```

would print:

A
A
B

VARIABLES

To save a value to a variable, assign it like so:

```
name = "Bob"
age = 15
```

Note here I did not assign types to these variables, as types are inferred, and can be changed (it's dynamic).

```
age = 15
age += 1 # increment age by 1
print(age)
```

This time I used comments beside the increment command.

COMMENTS

Comments are ignored in the program but there for you to leave notes, and are denoted by the hash # symbol. Multi-line comments use triple quotes like so:

```
"""
This is a very simple Python program that prints "Hello".
That's all it does.
"""

print("Hello")
```

LISTS

Python also has lists (called arrays in some languages) which are collections of data of any type:

```
numbers = [1, 2, 3]
```

Lists are denoted by the use of square brackets [] and each item is separated by a comma.

ITERATION

Some data types are iterable, which means you can loop over the values they contain. For example a list:

```
numbers = [1, 2, 3]


for number in numbers:
print(number)
```

This takes each item in the list numbers and prints out the item:

```
1
2
3
```

Note I used the word number to denote each item. This is merely the word I chose for this - it's recommended you choose descriptive words for variables - using plurals for lists, and singular for each item makes sense. It makes it easier to understand when reading.

Other data types are iterable, for example the string:

```
dog_name = "BINGO"


for char in dog_name:
print(char)
```

This loops over each character and prints them out:

```
B
I
N
G
O
```

RANGE

The integer data type is not iterable and trying to iterate over it will produce an error. For example:

fori in 3:

print(i)

will produce:

TypeError: 'int' object is not iterable

However you can make an iterable object using the range function:

fori in range(3):

print(i)

range(5) contains the numbers 0, 1, 2, 3 and 4 (five numbers in total). To get the numbers 1 to 5 use range(1, 6).

LENGTH

You can use functions like len to find the length of a string or a list:

name = "Jamie"

print(len(name)) # 5

names = ["Bob", "Jane", "James", "Alice"]

print(len(names)) # 4

IF STATEMENTS

You can use if statements for control flow:

name = "Joe"

iflen(name) > 3:

```
print("Nice name,")
print(name)
else:
print("That's a short name,")
print(name)
```

PYTHON FILES IN IDLE

To create a Python file in IDLE, click File > New File and you'll be given a blank window. This is an empty file, not a Python prompt. You write a Python file in this window, save it, then run it and you'll see the output in the other window.

For example, in the new window, type:

```
n = 0


fori in range(1, 101):
   n += i


print("The sum of the numbers 1 to 100 is:")
print(n)
```

Then save this file (File > Save or Ctrl + S) and run (Run > Run Moduleor hit F5) and you'll see the output in your original Python window.

EXECUTING PYTHON FILES FROM THE COMMAND LINE

You can write a Python file in a standard editor like Vim, Nano or LeafPad, and run it as a Python script from the command line. Just navigate to the directory the file is saved (use cd and ls for guidance) and run with python, e.g. python hello.py.

RESULT:

This section discusses the results, and the observations found while experimenting starting from the performance measurement techniques for food classification.
The performance of the system is high, and is considered acceptable from a usage point of view. However, the CNN need high-performance computing machines in order to experiment on the huge multi-media datasets. The CNN is capable of train highly non-linear data, and for that in contrast, it takes more computational time to train the network. However, the performance matters a lot, and once the system is properly trained, the system can produce the results in less time. The images are properly pre processed and all kinds of images are tested with CNN. From this, it is concluded that CNN are more suitable for classifying the images when the number of classes are more. The task of image classification can be extended using prominent features that can categorize food images. Since the CNN are consuming high computational time, the feature-based approach is highly appreciable. A multi-level classification approach (hierarchical approach) is suitable to avoid mis-classifications when the number of classes is more.Moreover, a dataset containing all food categories is also not available in the literature yet.

CONCLUSION

Food plays an essential role in human life, providing various nutrients, and therefore the consumption of food is crucial for our health. Food

classification is therefore a crucial aspect in maintaining a healthy lifestyle. In the world of health and medicine, food image classification is an emerging research area. A survey of automatic food classification methods based on Convolutional Neural Networks has been presented. The majority of the work uses the Food-101 dataset to train the models. Among the different approaches, InceptionV3-based systems provide higher accuracy in food image classification.

ADVANTAGE :

- Opportunities to help people understand there daily eating habits, exploring nutricians patterns maintain a healthy diet.