IBM PROJECT

AI POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIASTS

TEAM ID : PNT2022TMID30612

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ABSTRACT

Food is a necessity for human life and has been addressed in numerous medical conventions. Modern dietary evaluation and nutrition analysis technologies give consumers more possibilities to explore nutrition patterns, comprehend their daily eating habits, and keep up a balanced diet. Finding out a food's nutritional value is done through nutritional analysis. Information about the chemical make-up, processing, quality assurance, and contamination of food is a crucial component of analytical chemistry. The primary goal of the project is to develop a model that will be used to categorise fruits according to their various attributes, such as colour, shape, and texture. Here, users can take pictures of various fruits, which are subsequently uploaded to a trained algorithm for analysis. The algorithm examines the image and determines the nutritious content of fruits such (Sugar, Fibre, Protein, Calories, etc.). **Back Propagation Neural Network** technique is utilized as a classification approach to forecast the nutritional content.

1. INTRODUCTION

1.1 PROJECT OVERVIEW

The way of life in the contemporary world is changing every day, and with these changes comes a change in the needs of the human body's composition, which includes a variety of consumables or prepared foods. One problem that arises in our daily lives as a result of an abundance of food is obesity, or fatness. This problem is brought on by the body's overuse of calories. Obesity is becoming a widespread issue in contemporary society. We thus require a system that can influence people's eating preferences and provide them instructions that result in good body maintenance. People can determine their daily intake of calories from their food items if a system notifies them of the nutritional information of a food item and classifies it as healthy or unhealthy and also the nutrition content to the user. Our task is to first ascertain the category of food, and then after forecasting the category of food (fruit or vegetable), our system ascertains the category of that image (if the image is in the category of food or vegetable). In order to identify the category based on the image uses a combination of Deep Learning to recognise the image. Numerous segmentation and image characteristics are included in our system.

1.2 PURPOSE

Our task is to first identify the food category, and then, following the prediction of the food category (fruit or vegetable), our system identifies the category of that image (if the image is in the category of food or vegetable). Uses a combination of deep learning to recognise the image and identify the category based on it. Our system includes several segmentation and image properties.

2. LITERATURE REVIEW

2.1 EXISTING PROBLEM

2.1.1 TITILE : Study for Food Recognition System Using Deep Learning
AUHTOR: Nareen O. M. Salim

The evaluation of weight reduction therapy has been shown in the literature to greatly benefit from accurate dietary assessment. The majority of contemporary nutritional evaluation techniques, however, rely on memory. Current computer-based food identification system development for accurate food evaluation is now possible via rich Cloud services and complete mobile devices. Addressing the issue of food detection and identification in images of various foods. The issue is worsened by the wide range of food products with low inter- and large intra-class differences and the scant information in a single image. By outlining the general application of numerous fusion-trained classifiers, it is possible to improve the identification and recognition of traits gleaned from different deep models. This essay investigated numerous methods for identifying foods. The Food identification is a challenging challenge since food products are presented; Sometimes, they are different within the same group. A sort of issue with categorizing fine-grained pictures as the identification of food pairwise local characteristics that take advantage of eight specific food ingredients' positional relationships. The proposed multi-food image recognition system that detects first food recognizes color, texture, gradient, and SIFT extracted by several detectors using multiple kernels learning regions. The food is divided into 300 blocks, and five classes are further classified, such as staple, main dish, side dish, fruit, and non-food from each block's extract color and DCT coefficients. Food identification and quantity estimation are part of the TADA dietary evaluation system.

2.1.2 TITILE : Efficient extraction of deep image features using convolutional neural network (CNN) for applications in detecting and analysing complex food matrices

AUHTOR: Yao Liu , Hongbin Pu , Da-Wen Sun b

For the food sector, it is important to establish tools and processes for quickly and accurately identifying and analysing food quality and safety goods. traditional methods for machine learning Based on handcrafted traits, they typically perform poorly since they have a limited capacity to describe complex culinary properties. The convolutional neural network (CNN), which is the most widely used architecture of deep learning and has been increasingly used for the detection and analysis of complex food matrices, has recently emerged as an efficient and viable method for feature extraction. Goals and strategy: The current review introduces multi-feature aggregation techniques, 1-D, 2-D, and 3-D CNN models for feature extraction, and the structure of CNN. CNN's uses as a depth feature. With the improvement of the quality of life, people are increasingly conscious of high quality and safe food products in daily life, therefore the development of methods for reliably detecting and analysing food quality and safety is important for the industry. With the unique advantages of strong feature learning and good generalization ability, CNN is potential and attractive for effective and efficient analysis of complex food matrices. CNN can not only automatically locate important features, but can also obtain unparalleled performance under challenging conditions such as complex background, and different resolutions and orientations of the images. Despite the advantages of CNN in the provision of better performance, there still remain numerous challenges to its applications in the food domain.

2.1.3 TITILE : The Use of Different Image Recognition Techniques in Food Safety: A Study

AUHTOR: Rijwan Khan, Santosh Kumar

In order to prevent foodborne illness and harm, food must be properly prepared, transported, and stored. Food products may encounter a variety of health risks from farm to factory and factory to fork. Food safety is therefore essential from a financial and moral standpoint. The consequences of not complying with food safety regulations are diverse.)e demand for precise, rapid, and neutral quality assessments of these qualities in food products is increasing as dietary requirements and high-quality standards are demanded more frequently. To accomplish these goals, computer vision offers an automated, non-destructive, and cost-effective method. Its usefulness for fruit and vegetable assessment and classification has been proven by a significant body of research. It highlights the key elements of image processing technology and provides an overview of the most recent developments in the food industry. Public health is consistently and significantly burdened by foodborne illnesses. After more than a century Large-scale changes in food production, distribution, and regulations were pushed and fed into macrosocial pressures like population growth, urbanisation, and globalisation . Compared to other economic sectors, the food industry and distribution network, in particular, have created huge amounts of data in recent years. To increase the safety of the food supply, several types of data were imaginatively examined at various points along the agricultural value chain . For instance, toxic contaminations on farmlands were forecasted in preharvest, field, and weather forecasts; in the retail setting, contactless audits and record-keeping were carried out for 1.4 million months; and observations of Hindawi Journal of Food Quality Volume

2.1.4 TITILE : Barriers to and Facilitators for Using Nutrition Apps: Systematic Review and Conceptual Framework

AUHTOR: Laura Maria König, Christiane Attig

Diet-related health risk factors and eating habits can both be modified with the help of nutrition apps. Although they might slow the rising rates of overweight and obesity, they haven't yet been widely adopted. Therefore, comprehensive understanding of The development of design recommendations targeted at promoting adoption and sustained use of nutrition apps requires an understanding of the factors encouraging and discouraging (long-term) app use. The literature on obstacles to and enablers of the use of nutrition apps across disciplines, as well as empirical qualitative and quantitative studies with current, former, and non-users of nutrition apps, has been synthesised in this systematic review. PsychINFO, PSYNDEX, PsycArticles, PubMed, Web of Science, and SPORTDiscus were among the six databases used in a comprehensive literature search that also included backward and forward citation searches. The anticipated data extraction procedure, the inclusion and exclusion criteria, and the search strategy were all registered in advance. All empirical qualitative and quantitative publications in German or English that focused on adolescents (aged 13–18) or adults who were either present, former, or non-users of nutrition apps were eligible for inclusion. Individual barriers and facilitators were extracted and put into categories based on a qualitative content analysis. Multiple factors influencing participation with mobile weight reduction and weight maintenance therapies have been discovered by two systematic evaluations. These elements include social support, customisation, ease of use, entertainment, and the availability of tools like self-monitoring, prompts, and feedback.

2.1.5 TITILE : Identification of malnutrition and prediction of BMI from facial images using real-time image processing and machine learning

AUHTOR: Dhanamjayulu C, Nizhal U N

The usable information on human faces can be used to determine an individual's age, gender, weight, etc. Body mass index (BMI) and weight are two of these biometrics that are reliable predictors of health. Based on recent health science studies, this work proposes a regression approach based on the 50-layer Residual network architecture to investigate ways to identify malnourished individuals and obese individuals by evaluating body weight and BMI from facial photos. Multi-task Cascaded Convolutional Neural Networks have been used for face detection. A method is developed to assess BMI, age, and gender using real-time photographs of human faces. Obesity and malnutrition are frequently identified with the aid of BMI. The estimation of height, weight, and BMI using automated methods was done in earlier publications. Today's social networks, like Facebook, Instagram, and Snapchat, contain a variety of functions, including the trading of images, looking for a job, dating, and blogging. More and more people around the world are capturing their lives with digital cameras and publishing the records as images or videos on social media networks. The proposed method is useful in establishing the relation between the characteristics of the human face and the body, such as body height and weight. The proposed method to identify Malnutrition and obese children from human faces. The proposed system does not require the full body real image of a person. Face detection is done with the Multi-task Cascaded Convolution Neural Networks on pictures with single/multiple faces. BMI, age, and gender are estimated from a person’s face using residual neural networks. The problems of BMI, age, and gender estimation are posed as three separate regression pattern classification problems. The dataset of facial images taken from the internet along with their metadata containing information like gender, age, and BMI.

2.2 REFERENCES

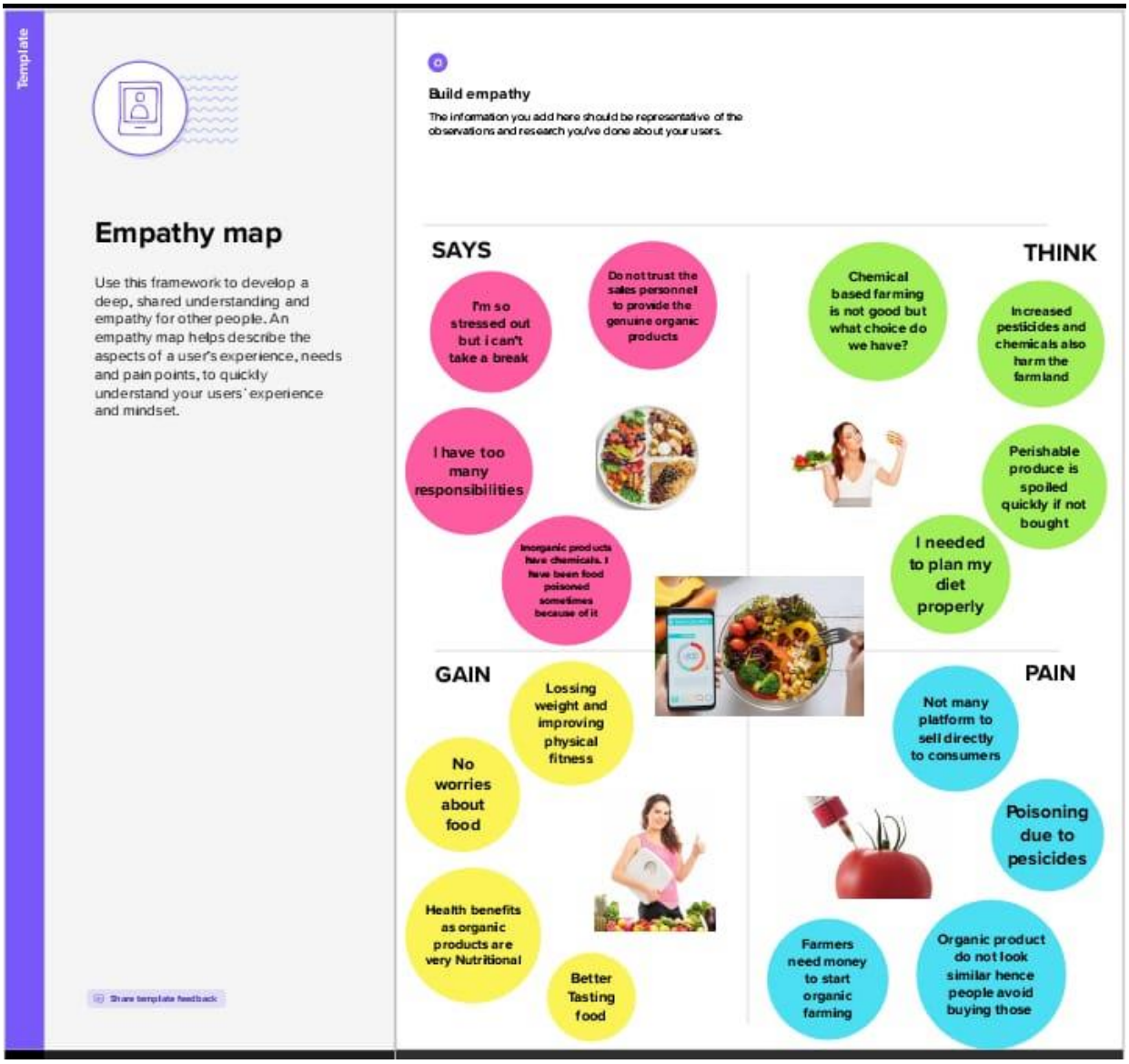
1. Nareen O. M. Salim, Study for Food Recognition System Using Deep Learning,2021
2. Yao Liu , Hongbin Pu, Efficient extraction of deep image features using convolutional neural network (CNN) for applications in detecting and analysing complex food matrices, 2021
3. Rijwan Khan, Santosh Kumar, The Use of Different Image Recognition Techniques in Food Safety: A Study, 2021
4. Laura Maria König, Barriers to and Facilitators for Using Nutrition Apps: Systematic Review and Conceptual Framework, 2021
5. Dhanamjayulu C, Identification of malnutrition and prediction of BMI from facial images using real-time image processing and machine learning, 2021

2.3 PROBLEM STATEMENT DEFINITION

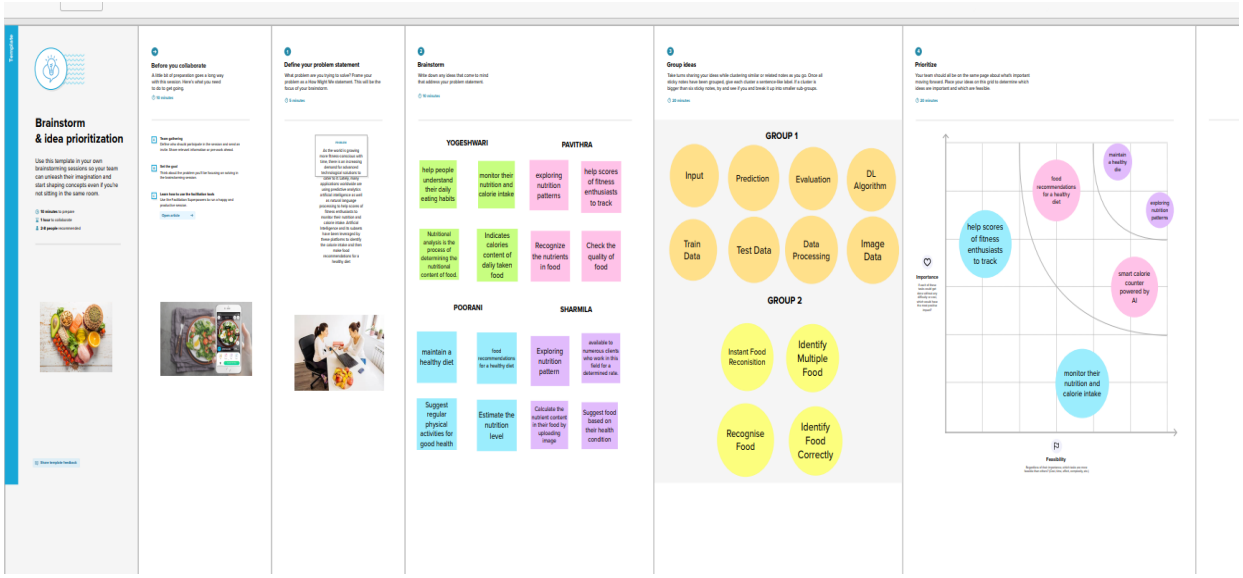
In existing system, recent advances in computer vision and machine learning are changing the way food data is analysed. However, due to the large number of food items and the inefficiency of the detection algorithm, food-related images are often difficult to recognise and sluggish to detect. Obtaining a diet plan is also entirely manual. People must contact their Dietician to learn about the recommended diet plan and may have to wait for several hours at times. This makes it difficult for users to obtain their diet plan. When viewed through the eyes of the end user, this is inefficient.

3. IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING



3.3 PROPOSED SOLUTION

To sustain a healthy life, sufficient intake of energy and nutrition is extremely vital which comes through good eating habits alone. Healthy eating not only preserves the lifestyle quality but also avoids chronic diseases like diabetes, high blood pressure, mental illness, asthma and so on. One of the most prevalent disorders brought on by over eating is obesity. In obesity, extra body fat builds up to the point that it compromises a person's health. Create an automated nutrition analysis system for the proposed system to identify and locate food items from the provided photos. Create a three-step method specifically for identifying numerous foods in photos by identifying potential areas and categorising them with deep neural networks. The automated system creates numerous regions of proposals from the supplied photographs in the first stage. Then, it organises each region of ideas by plotting them on feature maps, classifying them into various food groups and pinpointing where they are in the original photographs. Finally, compute the calories, fat, carbohydrates, and protein contents to provide a dietary evaluation report by analysing the nutritional components in the photographs. The dataset's expansion to include a wider range of food types will also improve the system's efficiency and precision.

3.4 PROBLEM SOLUTION FIT

There is no systematic method for swiftly gathering dietary information. To see a diet professional, one must wait for hours. Analyze the nutritional ingredients in the photographs, and then calculate the calories, fat, carbohydrates, and protein levels to provide a dietary evaluation report. Expanding the information to encompass a wider range of food types will further improve the system's efficacy and accuracy.

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

Upload Image

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

Filtering Noise

Utilizing filter methods reduce noise in pictures to determine nutrition depending on the fruits or vegetables. The filter's goal is to get rid of noise that ruins images. A statistical approach backs it up. A filter's typical frequency response is constructed. Filtering is a nonlinear technique widely used in image processing to reduce "salt and pepper" noise. A median filter is preferable to convolution when edge preservation and noise reduction are priorities. Similarly, perform photo binarization exercises. Document picture binarization is used in the pre-processing step of document analysis to distinguish the text in the foreground from the background of the document. A rapid and accurate document image binarization approach is essential for the subsequent document image processing activities.

Classification

The process of classifying data into different groups is known as classification. The technique begins by predicting the class of the supplied data points. On both organized and unstructured data, classification is possible. The classes are sometimes referred to by the words target, label, and classes. In the classification process, the food image uploaded from the user end will be compared with the food items in the system database for the features obtained in the feature extraction step. When the perfect match is found depending upon the features matched, the particular food item will be identified. The name of that identified food item will be visualized over the food. Convolution Neural Network algorithm is used here for the classification purpose.

Nutrition Detection

After the model has determined the food category or food type, the image is delivered to the food nutrition API, which then extracts the food's nutritional information and sends it to the system. The system compares the dietary allowance recommendations with the nutritional data. The user will receive a warning message to reduce nutrition intake if the amount of a particular nutrient, let's say calories, exceeds the recommended dietary allowance. If not, the user will see the nutritional value of the food.

4.2 NON FUNCTIONAL REQUIREMENTS

Usability

The system shall allow the users to access the system with pc using web application. The system uses a web application as an interface. The system is user friendly which makes the system easy

Availability

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

Scalability

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

Security

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

Performance

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

Reliability

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

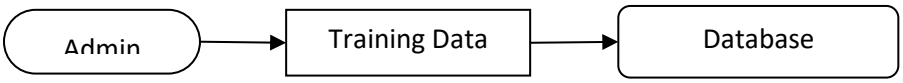
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS

A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

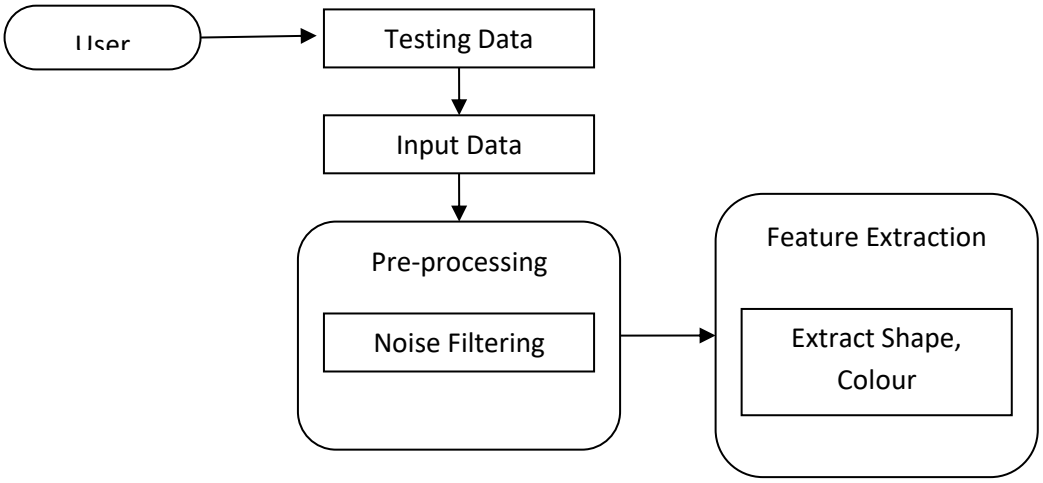
LEVEL 0

The Level 0 DFD shows how the system is divided into 'sub-systems' (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the system as a whole. It also identifies internal data stores that must be present in order for the system to do its job, and shows the flow of data between the various parts of the system.



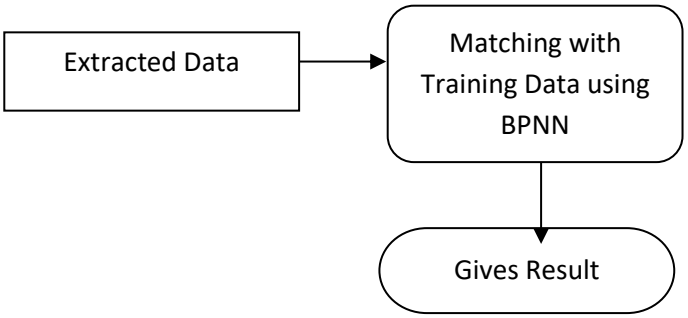
LEVEL 1

The next stage is to create the Level 1 Data Flow Diagram. This highlights the main functions carried out by the system. As a rule, to describe the system was using between two and seven functions - two being a simple system and seven being a complicated system. This enables us to keep the model manageable on screen or paper.



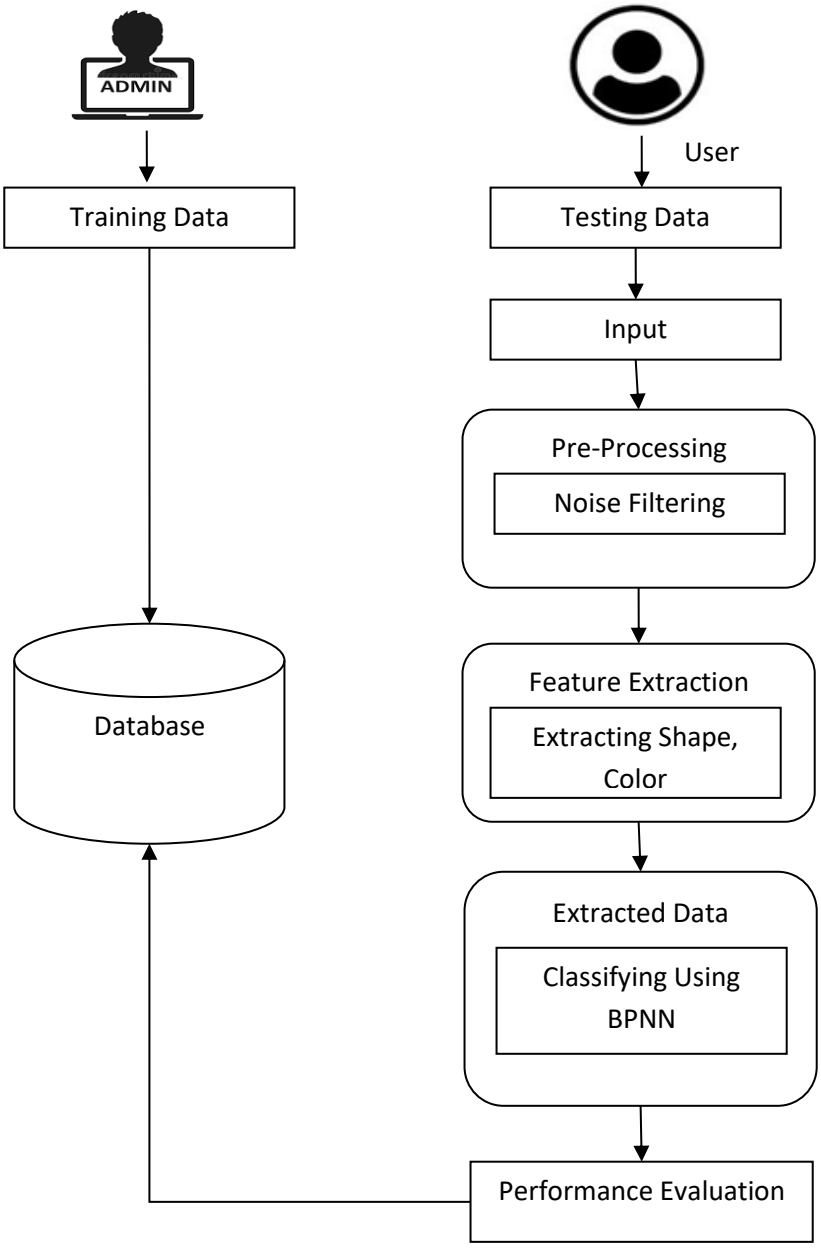
LEVEL 2

A Data Flow Diagram (DFD) tracks processes and their data paths within the business or system boundary under investigation. A DFD defines each domain boundary and illustrates the logical movement and transformation of data within the defined boundary. The diagram shows 'what' input data enters the domain, 'what' logical processes the domain applies to that data, and 'what' output data leaves the domain. Essentially, a DFD is a tool for process modelling and one of the oldest.



5.2 SOLUTION & TECHNICAL ARCHITECTURE

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. System architecture can comprise system components, the externally visible properties of those components, the relationships (e.g. the behavior) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages (ADLs).


ADMIN
User
Training Data
Testing Data
Input
Pre-Processing
Noise Filtering
Database
Feature Extraction
Extracting Shape, Color
Extracted Data
Classifying Using BPNN
Performance Evaluation

6. PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

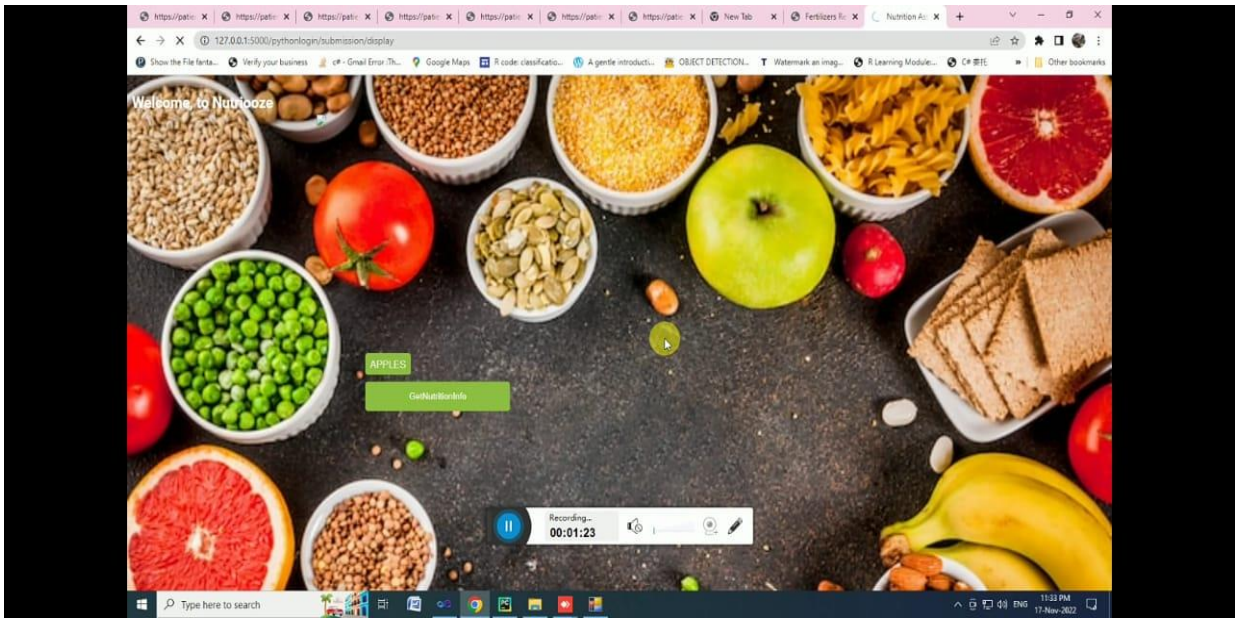
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	User can register for the application by entering user name and entering a strong password.	2	High	M.Gobika
Sprint-1	Login	USN-2	User can login to the application by entering user name and password	1	high	P.Bakyalakshmi
Sprint-2	Upload image	USN-3	User can input the food images into the application's document	1	high	T.J.Archana
Sprint-2	Prediction	USN-4	User can predict the image	1	medium	M.Muthtamil
Sprint-3	Recognize fruit	USN-5	User can choose their fruit type	1	medium	M.Gobika
Sprint-3	Recognize fruit type	USN-6	User can recognize their selected fruit in the output, and recognize it and its benefits	1	medium	P.Bakyalakshmi
Sprint-4	Recognize fruit data	USN-7	User can recognize the fruit colour in the dataset and differentiate it with others	1	high	T.J.Archana

6.2 SPRINT DELIVERY SCHEDULE

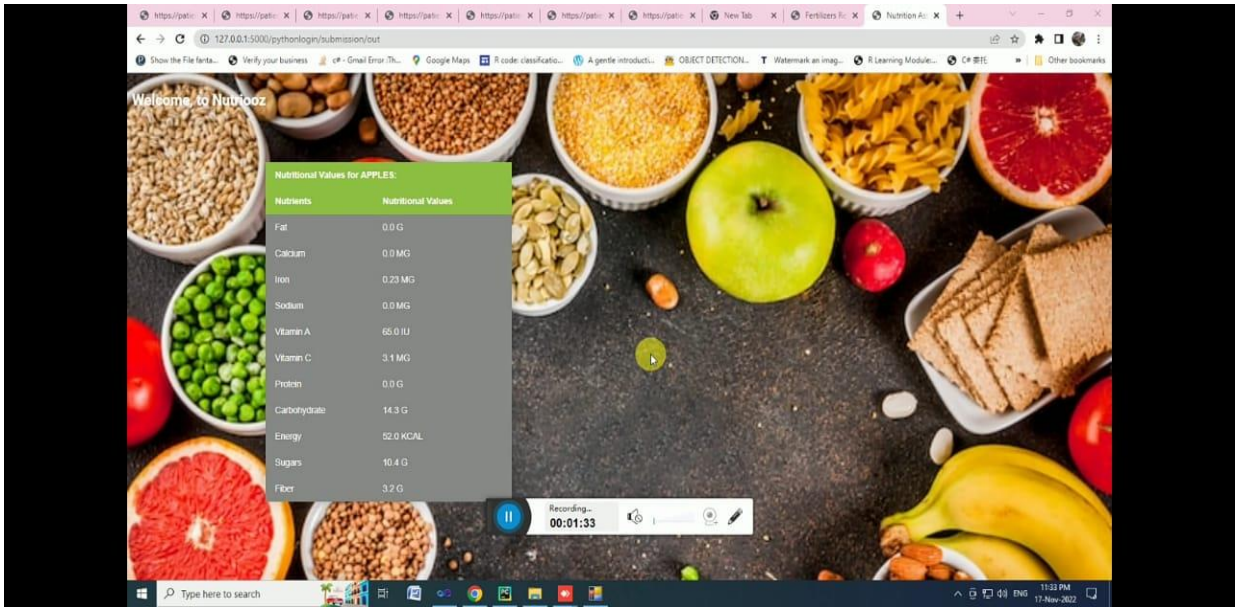
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint- 2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint- 4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

7. CODING & SOLUTIONING

7.1 FEATURE 1



7.2 FEATURE 2



8. TESTING

8.1 TEST CASES

A test case has components that describe input, action and an expected response, in order to determine if a feature of an application is working correctly. A test case is a set of instructions on “HOW” to validate a particular test objective/target, which when followed will tell us if the expected behavior of the system is satisfied or not.

Characteristics of a good test case:

- Accurate: Exacts the purpose.
- Economical: No unnecessary steps or words.
- Traceable: Capable of being traced to requirements.
- Repeatable: Can be used to perform the test over and over.
- Reusable: Can be reused if necessary.

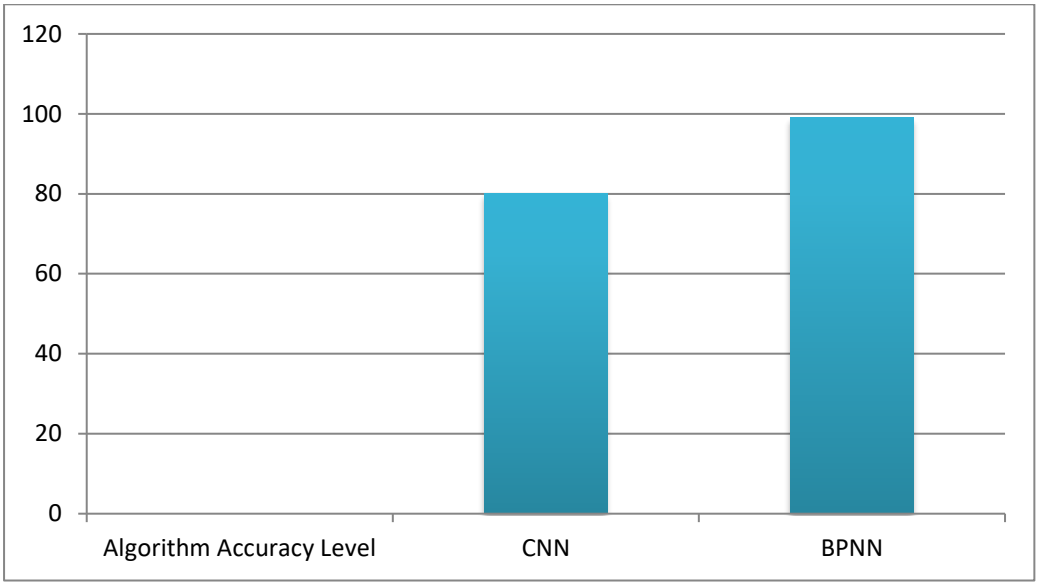
S.NO	Scenario	Input	Excepted output	Actual output
1	User login	User name and password	Login	Login success.
2	Upload Image	Upload input image (fruits and vegetables)	Predicting calorie, fat, carbs and food content of given image	Details are stored in a database.

8.2 USER ACCEPTANCE TESTING

This sort of testing is carried out by users, clients, or other authorised bodies to identify the requirements and operational procedures of an application or piece of software. The most crucial stage of testing is acceptance testing since it determines whether or not the customer will accept the application or programme. It could entail the application's U.I., performance, usability, and usefulness. It is also referred to as end-user testing, operational acceptance testing, and user acceptance testing (UAT).

9. RESULTS

9.1 PERFORMANCE METRICS



10. ADVANTAGES & DISADVANTAGES

ADVANTAGE

- Provide the nutrition content of Multifoods
- Helps for fitness people to maintain and know the proteins and calories of the food
- Gives accurate results in real-time application

DISADVANTAGE

- Hard to know the details of nutrition and calories of food
- Doesn’t ask to provide the users health condition
- Required more time to know the Multifoods

11. CONCLUSION

The approach for an automated food nutrition detection system that can determine the amount of nutrients in food is proposed in this project work. The machine has so far been able to place the meal into one of the many categories listed in the dataset. The well-known food dataset was used for the categorization. The classification of the food photos into their appropriate classifications using a deep learning approach. By reducing noise from the dataset, the classification process may be made better. The same research may be done with a larger dataset, more classes, and more photos in each class since a larger dataset increases accuracy by teaching the algorithm additional features and lowers the loss rate. The model's weights may be saved and used to create designs for food categorization, calorie extraction, and picture classification.

12. FUTURE SCOPE

The food photographs in this research study are categorised into the appropriate groups using a deep learning approach. In terms of future improvement, the classification task may be made better by reducing noise from the dataset. The same research may be done with a larger dataset, more classes, and more photos in each class since a larger dataset increases accuracy by teaching the algorithm additional features and lowers the loss rate. The model's weights may be saved and utilised to create a web or mobile application that classifies images and also extracts the calories from the food that has been identified.

13. APPENDIX

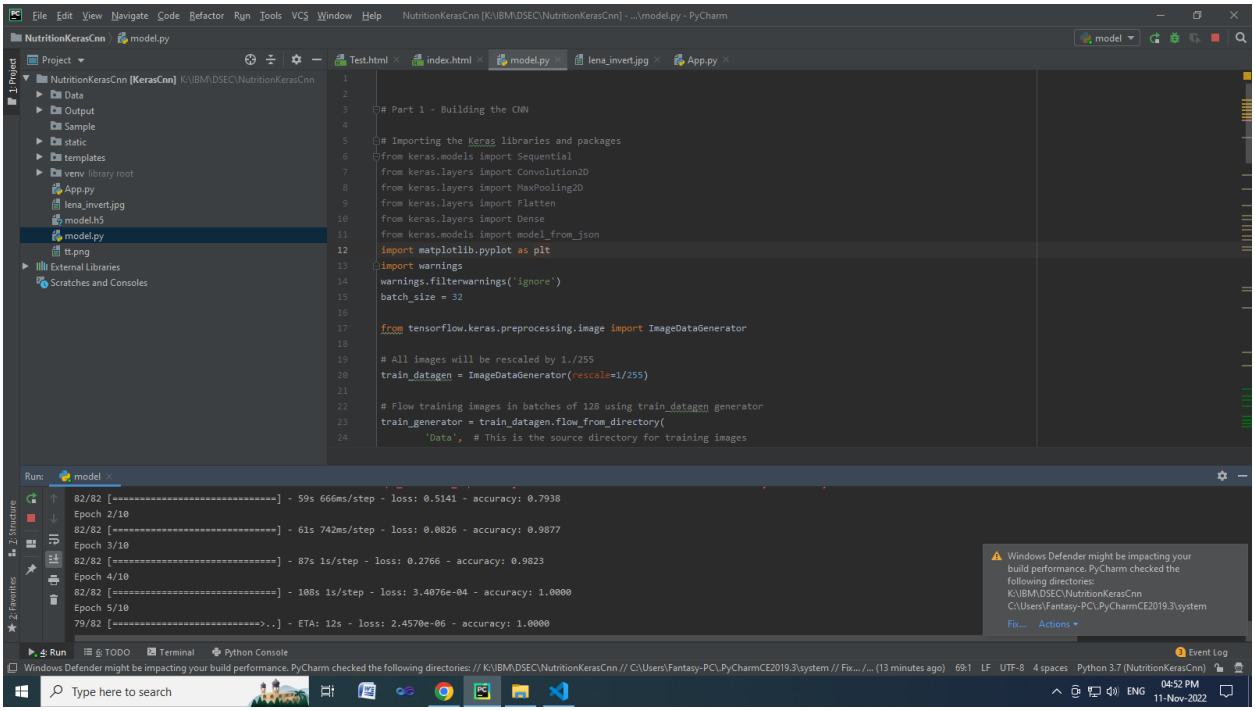
SOURCE CODE

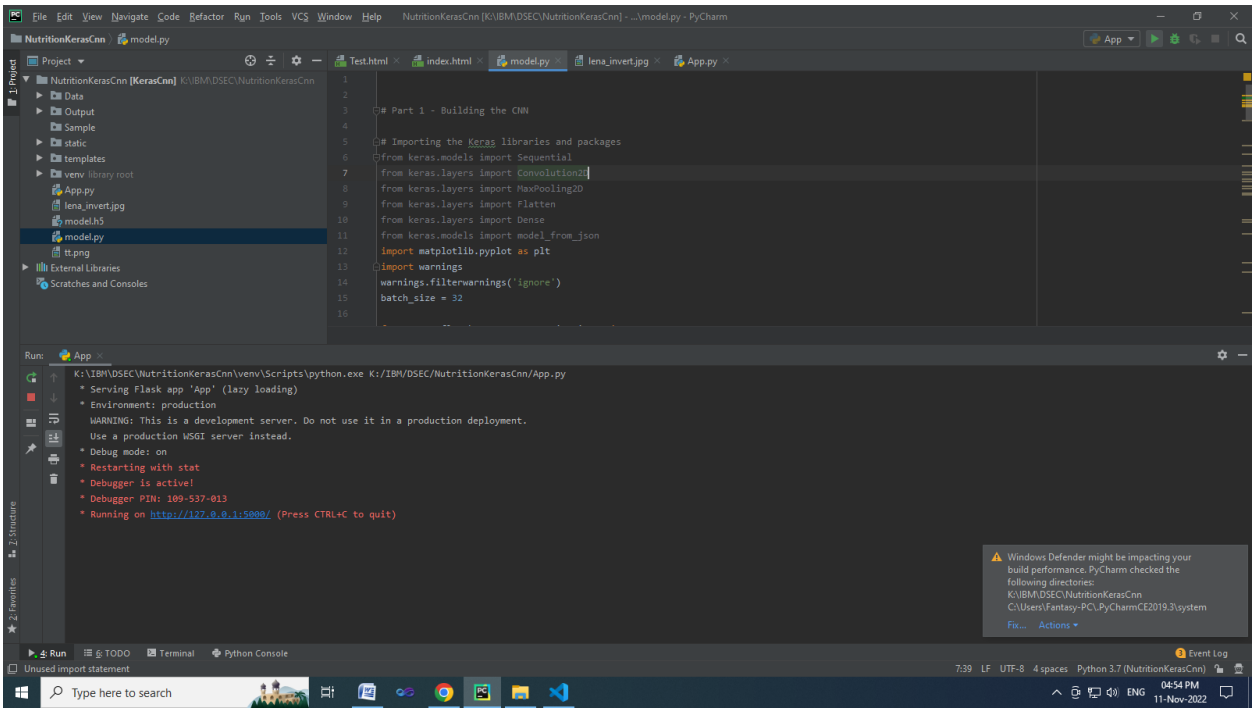
```
from flask import Flask, render_template, flash, request, session,send_file
from flask import render_template, redirect, url_for, request
import warnings
import datetime
import cv2
app = Flask(__name__)
app.config['DEBUG']
app.config['SECRET_KEY'] = '7d441f27d441f27567d441f2b6176a'
@app.route("/")
def homepage():
    return render_template('index.html')
@app.route("/Test")
def Test():
    return render_template('NewUser.html')
@app.route("/testimage", methods=['GET', 'POST'])
def testimage():
    if request.method == 'POST':
        file = request.files['fileupload']
        file.save('static/Out/Test.jpg')

        img = cv2.imread('static/Out/Test.jpg')
        if img is None:
            print('no data')
```

```
img1 = cv2.imread('static/Out/Test.jpg')
print(img.shape)
img = cv2.resize(img, ((int)(img.shape[1] / 5), (int)(img.shape[0] / 5)))
original = img.copy()
neworiginal = img.copy()
cv2.imshow('original', img1)
gray = cv2.cvtColor(img1, cv2.COLOR_BGR2GRAY)

img1S = cv2.resize(img1, (960, 540))

cv2.imshow('Original image', img1S)
grayS = cv2.resize(gray, (960, 540))
cv2.imshow('Gray image', grayS)
gry = 'static/Out/gry.jpg'
cv2.imwrite(gry, grayS)
from PIL import  ImageOps,Image

im = Image.open(file)
im_invert = ImageOps.invert(im)
inv = 'static/Out/inv.jpg'
im_invert.save(inv, quality=95)

dst = cv2.fastNlMeansDenoisingColored(img1, None, 10, 10, 7, 21)
cv2.imshow("Nosie Removal", dst)
noi = 'static/Out/noi.jpg'

cv2.imwrite(noi, dst)
```

```
import warnings
warnings.filterwarnings('ignore')

import tensorflow as tf
classifierLoad = tf.keras.models.load_model('model.h5')

import numpy as np
from keras.preprocessing import image

test_image = image.load_img('static/Out/Test.jpg', target_size=(200, 200))
img1 = cv2.imread('static/Out/Test.jpg')
# test_image = image.img_to_array(test_image)
test_image = np.expand_dims(test_image, axis=0)
result = classifierLoad.predict(test_image)

print(result)

out = ''
fer = ''
if result[0][0] == 1:

    out = "APPLES"
    fer = '52 calories/1per'

elif result[0][1] == 1:

    out = "BANANA"
    fer = '100 calories/1per'
```

```
            elif result[0][2] == 1:
                out = "ORANGE"
                fer = '50 calories/1per'

            elif result[0][3] == 1:
                out = "PINEAPPLE"
                fer = '60 calories/1per'

            elif result[0][4] == 1:
                out = "WATERMELON"
                fer = '400 calories/1per'

            org = 'static/Out/Test.jpg'

            return render_template('NewUser.html',fer=fer,result=out,org=org)
        if __name__ == '__main__':
app.run(debug=True, use_reloader=True)
```


File Edit View Navigate Code Refactor Run Tools VCS Window Help
NutritionKerasCnn [K:\IBM\DSEC\NutritionKerasCnn] - ...\model.py - PyCharm
NutritionKerasCnn
model.py
model
Project
Test.html
index.html
model.py
lena_invert.jpg
App.py
NutritionKerasCnn [KerasCnn] K:\IBM\DSEC\NutritionKerasCnn
Data
Output
Sample
static
templates
venv library root
App.py
lena_invert.jpg
model.h5
model.py
tt.png
External Libraries
Scratches and Consoles
# Part 1 - Building the CNN
# Importing the Keras libraries and packages
from keras.models import Sequential
from keras.layers import Convolution2D
from keras.layers import MaxPooling2D
from keras.layers import Flatten
from keras.layers import Dense
from keras.models import model_from_json
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
batch_size = 32
from tensorflow.keras.preprocessing.image import ImageDataGenerator
# All images will be rescaled by 1./255
train_datagen = ImageDataGenerator(rescale=1/255)
# Flow training images in batches of 128 using train_datagen generator
train_generator = train_datagen.flow_from_directory(
'Data', # This is the source directory for training images
Run: model
82/82 [==============================] - 59s 666ms/step - loss: 0.5141 - accuracy: 0.7938
Epoch 2/10
82/82 [==============================] - 61s 742ms/step - loss: 0.0826 - accuracy: 0.9877
Epoch 3/10
82/82 [==============================] - 87s 1s/step - loss: 0.2766 - accuracy: 0.9823
Epoch 4/10
82/82 [==============================] - 108s 1s/step - loss: 3.4076e-04 - accuracy: 1.0000
Epoch 5/10
79/82 [==========================>..] - ETA: 12s - loss: 2.4570e-06 - accuracy: 1.0000
Windows Defender might be impacting your build performance. PyCharm checked the following directories:
K:\IBM\DSEC\NutritionKerasCnn
C:\Users\Fantasy-PC\.PyCharmCE2019.3\system
Fix... Actions
Run TODO Terminal Python Console
Event Log
Windows Defender might be impacting your build performance. PyCharm checked the following directories: // K:\IBM\DSEC\NutritionKerasCnn // C:\Users\Fantasy-PC\.PyCharmCE2019.3\system // Fix... /... (13 minutes ago)
69:1 LF UTF-8 4 spaces Python 3.7 (NutritionKerasCnn)
Type here to search
ENG
04:52 PM
11-Nov-2022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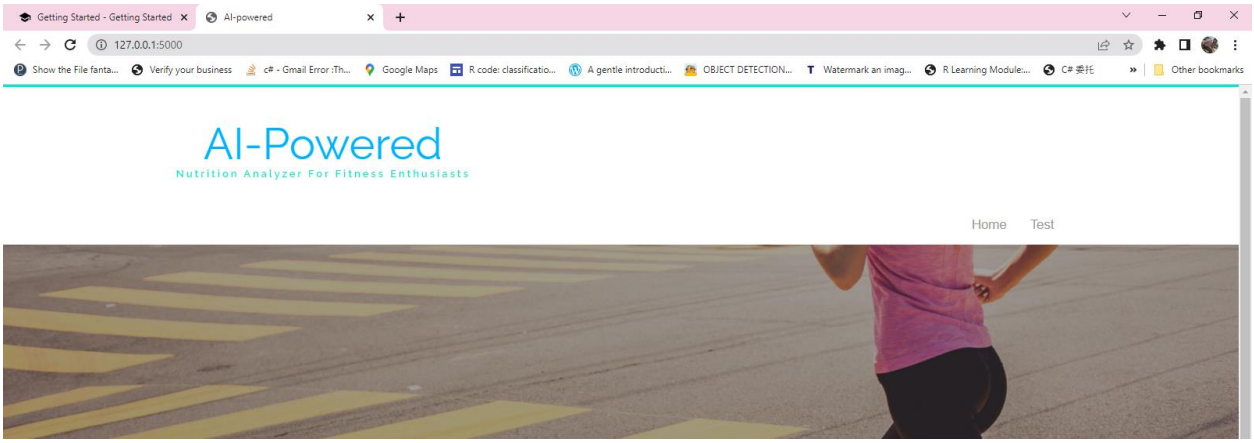
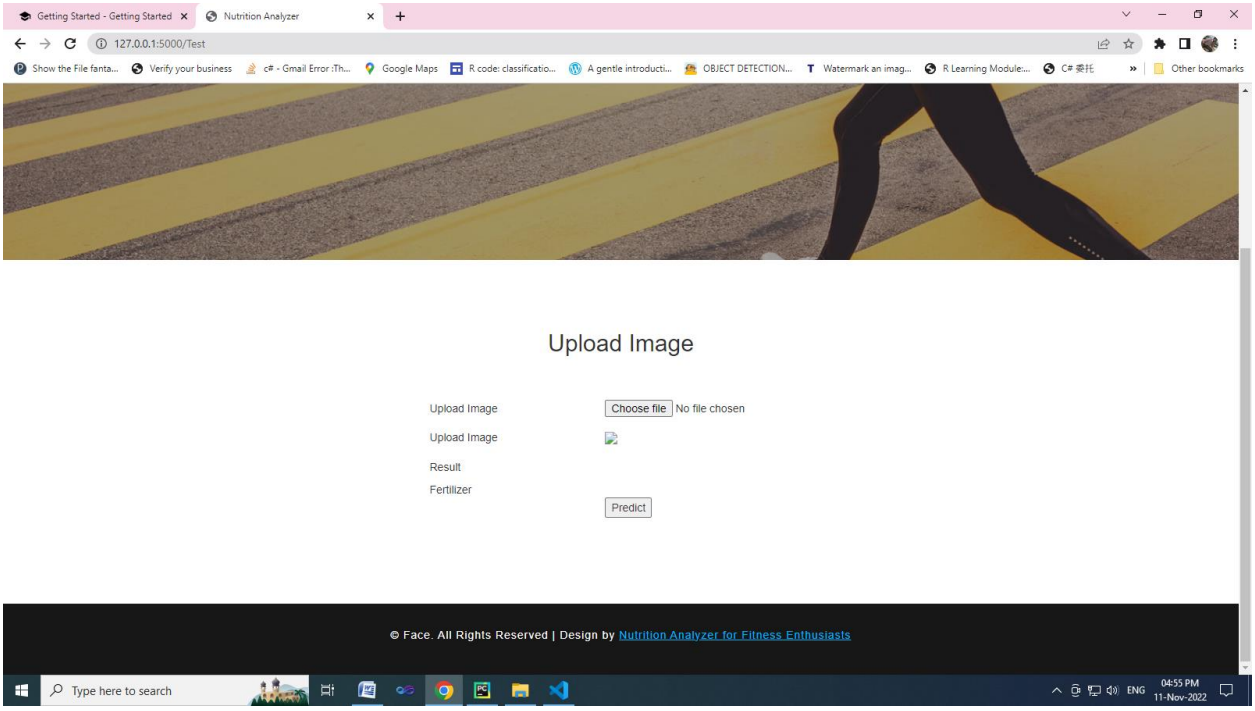
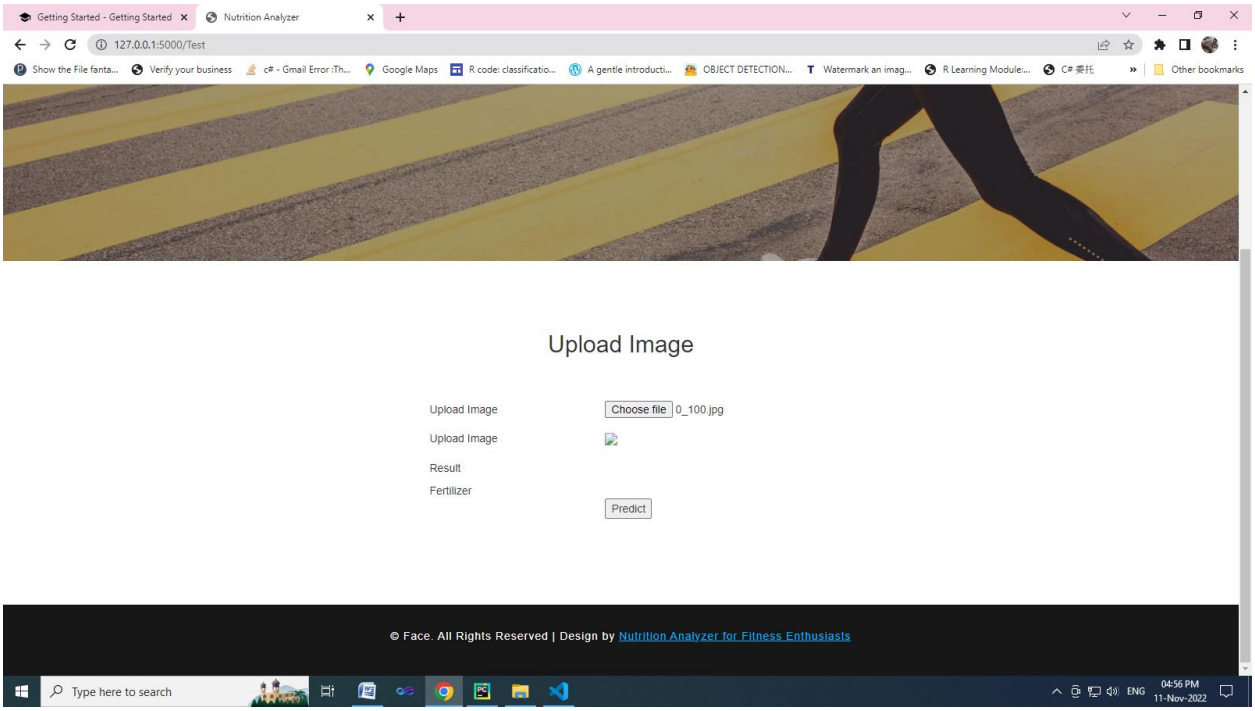
from keras.layers import Dense
from keras.models import model_from_json
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
batch_size = 32
Run: App
K:\IBM\DSEC\NutritionKerasCnn\venv\Scripts\python.exe K:/IBM/DSEC/NutritionKerasCnn/App.py
* Serving Flask app 'App' (lazy loading)
* Environment: production
WARNING: This is a development server. Do not use it in a production deployment.
Use a production WSGI server instead.
* Debug mode: on
* Restarting with stat
* Debugger is active!
* Debugger PIN: 109-537-013
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
Windows Defender might be impacting your build performance. PyCharm checked the following directories:
K:\IBM\DSEC\NutritionKerasCnn
C:\Users\Fantasy-PC\.PyCharmCE2019.3\system
Fix... Actions
Run TODO Terminal Python Console
Event Log
Unused import statement
7:39 LF UTF-8 4 spaces Python 3.7 (NutritionKerasCnn)
Type here to search
ENG
04:54 PM
11-Nov-2022


Getting Started - Getting Started
AI-powered
127.0.0.1:5000
AI-Powered
Nutrition Analyzer For Fitness Enthusiasts
Home
Test


Getting Started - Getting Started
Nutrition Analyzer
127.0.0.1:5000/Test
Upload Image
Upload Image
Choose file
No file chosen
Upload Image
Result
Fertilizer
Predict
© Face. All Rights Reserved | Design by Nutrition Analyzer for Fitness Enthusiasts
Type here to search
ENG
04:55 PM
11-Nov-2022


Getting Started - Getting Started
Nutrition Analyzer
127.0.0.1:5000/Test
Upload Image
Upload Image
Choose file
0_100.jpg
Upload Image
Result
Fertilizer
Predict
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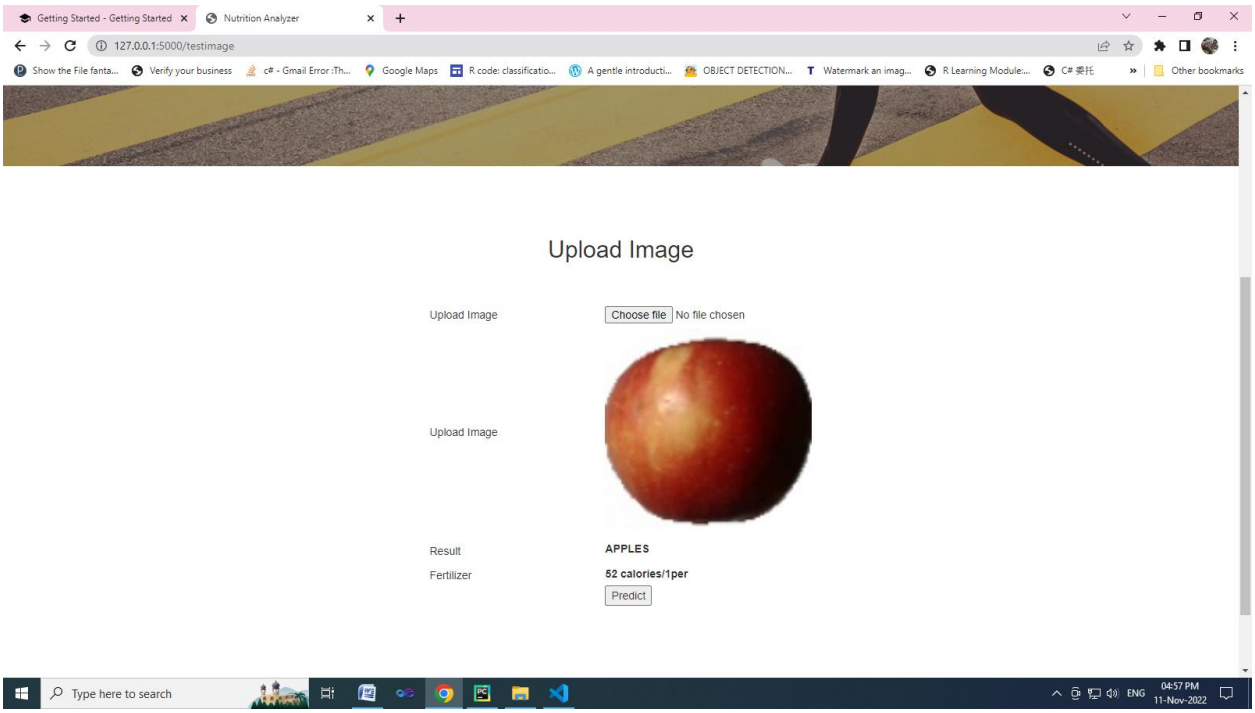
Type here to search
ENG
04:56 PM
11-Nov-2022


Getting Started - Getting Started
Nutrition Analyzer
127.0.0.1:5000/testimage
Upload Image
Upload Image
Choose file
No file chosen
Upload Image
Result
APPLES
Fertilizer
52 calories/1per
Predict
Type here to search
ENG
04:57 PM
11-Nov-2022

GITHUB LINK : https://github.com/IBM-EPBL/IBM-Project-15443-1659598642

PROJECT DEMO LINK: https://youtu.be/4MdkKyGDpiY