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1. INTRODUCTION

In a world where we're constantly bombarded with information and choices, it's difficult to know what's best for our health. Fortunately, there are now AI - powered nutrition analysis tools that can help us make better decisions about what to eat. These tools use data from our own bodies to provide personalized recommendations about which foods will help us reach our goals. Whether we're trying to lose weight, gain muscle, or just improve our overall health, AI - powered nutrition analysis can be a valuable asset in our quest for wellness. Imagine you are at the grocery store, Imagine you are at the grocery store, and you want to buy a nutritious and well-balanced meal for your family. You have limited time, and you don't know where to start. However, you see a new product on the shelf that claims to be able to help you with this exact problem. It's an AI - powered nutrition analysis tool that can help you make informed decisions about what to buy. With the advent of AI-powered nutrition analysis, we can now get tailored recommendations on what to eat and how much of it, based on our individual needs. This new form of nutrition analysis takes into account not just the calories in our food, but also the specific nutrients we need more or less of. And with its help, we can finally say goodbye to those one-size-fits-all diet plans and start eating in a way that's truly tailored to our own bodies. A new AI-powered nutrition analyzer has been developed that can help fitness enthusiasts better understand their dietary needs. The device, which is about the size of a smartphone, uses artificial intelligence to analyze a person's diet and provide customized recommendations .The analyzer is able to take into account factors such as a person's age, weight, activity level, and food preferences to provide tailored recommendations. It can also provide tips on how to improve one's diet and

address specific nutritional deficiencies. In today's world, there are more fitness enthusiasts than ever before. In today's world, there are so many gadgets and devices that claim to make our lives easier. One such gadget is the AI-powered nutrition analyzer. This nifty little device can help fitness enthusiasts keep track of their daily intake of nutrients, calories, and other important information .The best part about the AI-powered nutrition analyzer is that it is constantly learning and improving. It takes into account your individual needs and goals, and then provides tailored recommendations based on that data. So, if you're looking for a gadget that can help you live a healthier life, this is definitely one to consider

1.1 PROJECT OVERVIEW

In this project, We will be creating an AI-powered nutrition analyzer for fitness enthusiasts. This tool will be used to help users track their macronutrient intake and ensure that they are getting the right amount of nutrients for their desired results. The project will require the use of data from different sources, such as the USDA food database and fitness tracker data, in order to create a comprehensive analysis. We will be developing an AI-powered nutrition analyzer for fitness enthusiasts. The aim of this project is to create a tool that can help users track their nutrient intake and make better food choices. This project will require the use of data mining and machine learning algorithms to develop the nutrition analyzer. Food is essential for human life and has been the concern of many healthcare conventions. Nowadays new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is a vital part of analytical chemistry

that provides information about the chemical composition, processing, quality control and contamination of food. The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent the trained model. The model analyses the image and detect the nutrition based on the fruits like (Sugar, Fibre, Protein, Calories, etc.).

1.2 PURPOSE

Fitness enthusiasts are always looking for new ways to optimize their workout and diet regimens. And with the help of technology, they now have access to a variety of AI-powered tools that can do just that. One such tool is the Nutrition Analyzer, which is designed to help users track their nutrient intake and make better food choices. The app works by scanning the barcodes of food items and then providing detailed information about the nutritional content of those items. The app also includes a database of over 200,000 foods, so users can find information about almost any food they're interested in. And with the help of machine learning, the app gets smarter over time, making it more accurate and reliable for users. So if you're looking for a way to optimize your diet and reach your fitness goals, be sure to check out the Nutrition Analyzer.

2. LITERATURE SURVEY

Nutrition is vital to the growth of the human body. Nutritional analysis guarantees that the meal meets the appropriate vitamin and mineral requirements, and the examination of nutrition in food aid in understanding the fat proportion, carbohydrate dilution, proteins, fiber, sugar, and so on. Another thing to keep in

mind is not to exceed our daily calorie requirements. If this limit is surpassed, we may become fat. An app called “Eatly” uses the user’s food photograph to grade the mealϖ into one of three categories: “very healthy,” “it’s O.K.”, and “unhealthy.” However, rather than being done automatically by automated systems, the Rating is really done manually by the app’s user base. DeepFood: Computer-Assisted Nutritional Assessment Using Deep Learningϖ to Recognize Food Images – In order to solve this issue, a brand-new Convolutional Neural Network (CNN)-based food picture identification system was created, as described in this study. We utilized our suggested strategy on two sets of actual food picture data (UEC-256 and Food-101). Snap Meal for iPhone: Magical Meal Logging – This program asks the userϖ to snap a picture, provide information such whether they are having breakfast or lunch, and add a brief text caption in order to estimate the number of calories. The accuracy of calorie prediction is inconsistent, though, and is mostly reliant on how well individuals directly input text Neutrino: Artificial Intelligence Nutrition App. As the name implies, the app provides nutrition-based analytics and data to its customers and is quickly becoming a prominent platform for offering AI fitness services. It deploys predictive analysis for personalized data compilation using mathematical and natural language processing (NLP) models. Furthermore, it shares nutrition-related data with its partners via SDK and API integration to improve its services and product offerings. It Is an Israel-based firm created in 2011 that allows pregnant women to customize their body’s nutritional requirements. This software collaborated with IBM’s natural language capability to provide 24-hour assistance and dietary recommendations. FitnessAI : The Ultimate Workout at Home Solutionϖ This fitness AI software is designed with personalized training regimens for each individual. It began as “gym only software,” but has now improved its system to satisfy “at home fitness”

expectations. FitnessAI says that their algorithm has been trained on over 5.9 million exercises, allowing it to “outperform any human fitness teacher.” Furthermore, it analyzed almost 10 million sets, weights, and reps from about 30000 expert gym-goers and weightlifters during a three-year period. In other words, it is an outstanding illustration of machine learning in action for superior exercise planning. My Fitness Pal app creates a daily food diary for you by recognizing the foodϖ from photos you shoot. It is supposed to be as simple as that. You take a picture, dial in data such as whether you are eating breakfast or lunch and add a quick text label, and the app estimates the calorie content. It does a pretty good job, although its estimate can be a bit unpredictable. It also needs a network connection, which is something to think about when eating out.

2.1 EXISITING SYSTEM

Precision Nutrient Management Using Artificial Intelligence Based on Digital Data Collection Framework : Nutritional intake is fundamental to human growth and health, and the intake of different types of nutrients and micronutrients can affect health. The content of the diet affects the occurrence of disease, with the incidence of many diseases increasing each year while the age group at which they occur is gradually decreasing. (2) Methods: An artificial intelligence model for precision nutritional analysis allows the user to enter the name and serving size of a dish to assess a total of 24 nutrients. A total of two AI models, including semantic and nutritional analysis models, were integrated into the Precision Nutritional Analysis. A total of five different algorithms were used to identify the most similar recipes and to determine differences in text using cosine similarity. (3) Results: This study developed two models to form a precision nutrient analysis model. The 2013–2016 Taiwan National Nutrition Health Status Change Survey (NNHS) was used for

model verification. The model's accuracy was determined by comparing the results of the model with the NNHS. The results show that the AI model has very little error and can significantly improve the efficiency of the analysis. (4) Conclusions: This study proposed an Intelligence Precision Nutrient Analysis Model based on a digital data collection framework, where the nutrient intake was analyzed by entering dietary recall data. The AI model can be used as a reference for nutrition surveys and personal nutrition analysis. This study developed an AI model based on semantic text to analyze the nutritional ingredients of a nutrient, and a digital data semantic analysis model was designed to determine the names and servings of the dishes consumed. The AI model is based on the ingredients of common Taiwanese recipes and automatically calculates the nutrient intake. The model structure consists of a digital data semantic analysis model, an AI precision nutrient analysis model, a database of 1590 recipes, and 7869 ingredients from common Taiwanese recipe databases, and the model structure is shown in Figure 1. The nutrition information of the ingredients was obtained from the public data of the Health Promotion Administration, Ministry of Health and Welfare Taiwan (HPA, MoHW). Artificial Intelligence Semantic Analysis Model Data were intercepted and annotated after data entry, and a CKIP pre training model was used to interpret Chinese words. After completion, lexical annotation and entity identification were performed. Finally, the nouns (dish names) were converted into vector structures using word2vec, which is an application of Natural Language Processing proposed by Tomas Mikolov et al. at Google in 2013 and is one of the most significant advances in the field of machine learning in recent years. Word2vec is an application framework that learns large amounts of textual data and transforms words into mathematical vectors to discriminate their semantic meanings by embedding words into a two-dimensional space in order that words with similar semantic meanings can be closer together. This study used the

continuous bag-of-words (CBOW) method, which aims to determine the lexical properties of the input words using a whole paragraph of context and to determine the relationship between similar words by concatenating them. As similar words are clustered together, the direction of the vector corresponds to the relative relationship. The Nutritional Analysis Model is divided into three steps. Step 1 conducts artificial intelligence analysis to determine the most similar recipes. Due to the multi character nature of Chinese, single algorithm of semantic analysis may not be precise enough. Therefore, a variety of algorithms were used for the analysis. The AI model is composed of five different algorithms, including 1. Okapi BM25, 2. TF-IDF, 3. Levenshtein, 4. Jaccard, and 5. Synonyms. The algorithm also uses cosine similarity to determine differences in text and then compares it with a database to obtain food information and portion sizes for recipes and ingredient judgement.. This study developed two models to form a precision nutrient analysis model. The first model is a Digitized Data Semantic Analysis Model for dish analysis and portion size determination. The second model is a Nutrient Analysis Model that uses five different algorithms to find precision recipes, which conducts analyses of dish ingredients and nutrients using a common voting process, and the final outputs from both models calculate the intake of 24 common nutrients. The operational framework of the model is illustrated below. The recipe database contains 1590 recipes and nutrient information for 7869 ingredients. Each 24 h dietary recall nutrition survey in this study took approximately 40 min. The volume and complexity of the survey data and the variation in the ability to self-assess and recall portions can lead to individual subjective differences [13]. Similarly, the researchers or the methods used to collect dietary data may be biased [18]. Therefore, this study balanced the accuracy of nutrient intake analysis by compensating for errors through fuzzy analysis and artificial intelligence. Conventional FFQs are primarily designed to assess total

nutrient intake or changes in intake over time [27–29]; however, the FFQ limits the range of foods that can be investigated as it combines food and beverages thus determining the exact amount of nutrients is less precise than other more detailed methods. It is also not possible to accurately measure absolute intakes of different food components. Moreover, FFQs require literacy and the physical ability to complete the questionnaire, and the FFQ survey can be burdensome for subjects and difficult or confusing to complete due to poor descriptions or difficult-to-understand questions. The most commonly used methods in nutrition research are the Diet Record, 24HR, and FFQ. The Food Record is also used as the gold standard in validation studies [30]. Given the contingent nature of the respondents' food choices, a variety of food and beverage combinations [31] and nutrient supplementation [32] are the best methods to investigate. In order to reduce the burden on surveyors, the artificial intelligence model in this study has proven to be a feasible strategy for large-scale nutritional surveys after data discrepancy comparisons. When comparing the difference between our model and the data analyzed in the actual nutrition survey, it was found that the results of the "24-h dietary recall food weight and nutrient ingredient" method were highly accurate, with less than 2% discrepancy in analysis for almost all nutrients. This result shows that the nutrients of the ingredient data in our model are correct. In the 24 h dietary recall nutrient intake sum analysis, the model was used to conduct an artificial intelligence analysis of the dishes, meaning it conducted an automated analysis of the components and servings to estimate nutrient intake. The results show a margin of error of less than 10% thus confirming the high accuracy of the model in this study. This study proposed an Intelligence Precision Nutrient Analysis Model based on a digital data collection framework, where the nutrient intake was analyzed by entering dietary recall data. The AI Precision Nutrient Analysis Model was used to analyze the ingredients of the dishes and calculate

nutrient intake by automatically analyzing the dishes, and portion sizes were analyzed using a digital data semantic analysis model. The results of this study show very little difference in nutrient intake between the model and the NNHS analysis and are highly accurate; therefore, the AI model can be used as a reference for nutrition surveys and personal nutrition analysis. In terms of data access, as there is not yet a complete set of publicly available data on food nutrient ingredients; more complete data and references on micro-nutrients should be available in the future. On the other hand, the scope of recipes should be expanded.

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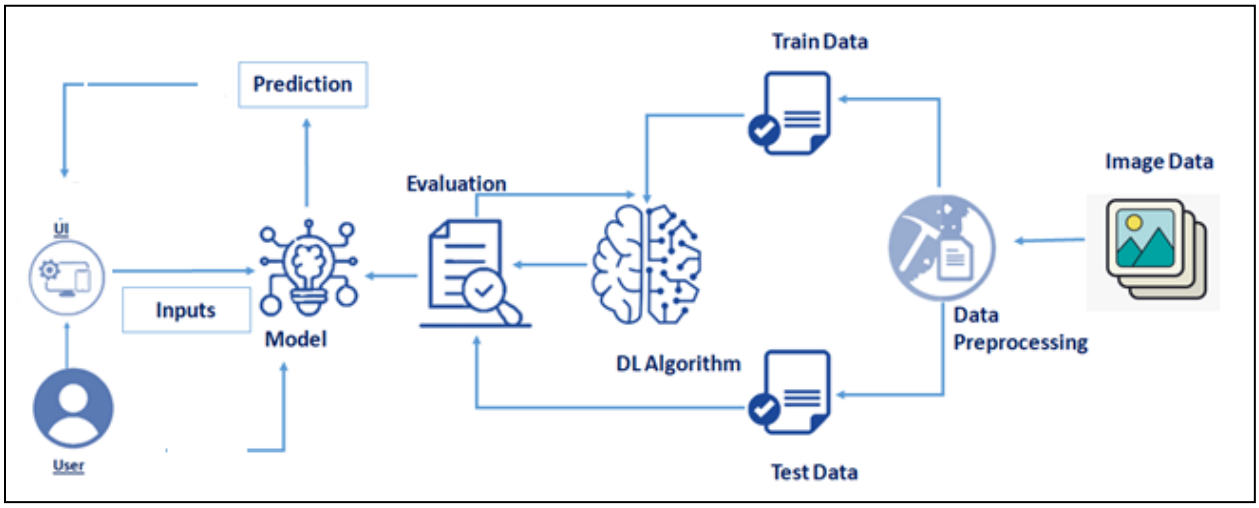
2.3 PROBLEM STATEMENT DEFINITION

Food is essential for human life and has been the concern of many healthcare conventions. Nowadays new dietary assessment and nutrition analysis tools enable more opportunities to help people understand their daily eating habits, exploring nutrition patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and contamination of food. The main aim of the project is to building a model which is used for classifying the fruit depends on the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent the trained model. The model analyses the image and detect the nutrition based on the fruits like (Sugar, Fibre, Protein, Calories, etc.). Artificial intelligence (AI) as a branch of computer science, the purpose of which is to imitate thought processes, learning abilities and knowledge management, finds more and more applications in experimental and clinical medicine. In recent decades, there has been an expansion of AI applications in biomedical sciences. The possibilities of artificial intelligence in the field of medical diagnostics, risk prediction and support of therapeutic techniques are growing rapidly. The aim of the article is to analyze the current use of AI in nutrients science research. The literature review was conducted in PubMed. A total of 399 records published between 1987 and 2020 were obtained, of which, after analyzing the titles and abstracts, 261 were rejected. In the next stages, the remaining records were analyzed using the full-text versions and, finally, 55 papers were selected. These papers were divided into three areas: AI in biomedical nutrients research, AI in clinical nutrients research and AI in nutritional

epidemiology . It was found that the artificial neural network (ANN) methodology was dominant in the group of research on food composition study and production of nutrients. However, machine learning (ML) algorithms were widely used in studies on the influence of nutrients on the functioning of the human body in health and disease and in studies on the gut microbiota. Deep learning (DL) algorithms prevailed in a group of research works on clinical nutrients intake. The development of dietary systems using AI technology may lead to the creation of a global network that will be able to both actively support and monitor the personalized supply of nutrients.

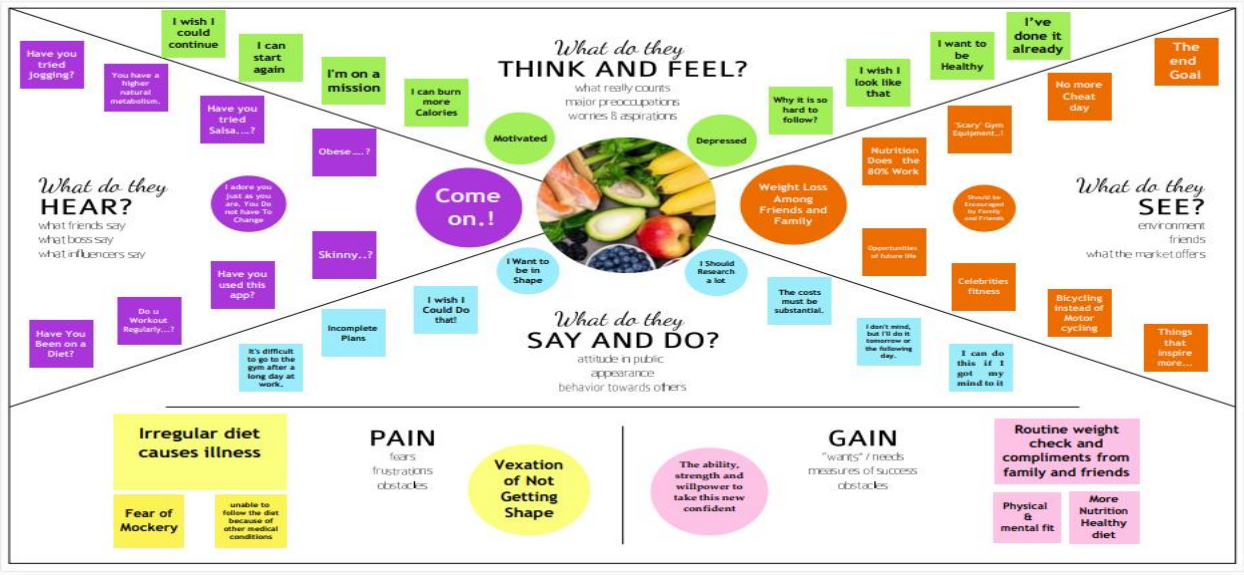
Technical Architecture:



2. IDEATION & PROPOSED SOLUTION

The user interacts with the UI (User Interface) and give the image as input. Then the input image is then pass to our flask application, And finally with the help of the model which we build we will classify the result and showcase it on the UI. Dataset folder contains the training and testing images for training our model. We are building a Flask Application that needs HTML pages stored in the templates folder and a python script app.py for server side scripting we need the model which is saved and the saved model in this content is a nutrition.h5 templates folder contains home.html, image.html, image prediction.html pages. Statis folder had the css and js files which are necessary for styling the html page and for executing the actions Uploads folder will have the uploaded images(which are already tested). Sample images will have the images which are used to test or upload. Training folder contains the trained model file.

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

MADHAVAN.M

MEHA V.S

NEERAJ.D

NANDHINI.S

1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

Food is crucial for human life and has been the subject of numerous healthcare conventions. Nowadays, modern dietary assessment and nutrition analysis tools allow more options to help people understand their daily eating habits, investigate nutrition trends and maintain a healthy diet. Nutritional analysis is the method of determining the nutritional composition of food. It is a critical aspect of analytical chemistry that offers information about the chemical composition, processing, quality control and contamination of food. The major purpose of the project would be to construct a model which is used for classifying the fruit depending on the many features like color, shape, texture etc.. Here the user can capture the photographs of different fruits and then the image will be provided to the trained model. The model examines the image and identifies the nutrition depending on the fruit's as (Sugar, Fiber, Protein, Calories, etc)

Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

A **Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

Strategy blueprint
Define the components of a new idea or strategy.

Open the template →

Customer experience journey map
Understand customer needs, motivations, and obstacles for an experience.

Open the template →

Strengths, weaknesses, opportunities & threats
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.

Open the template →

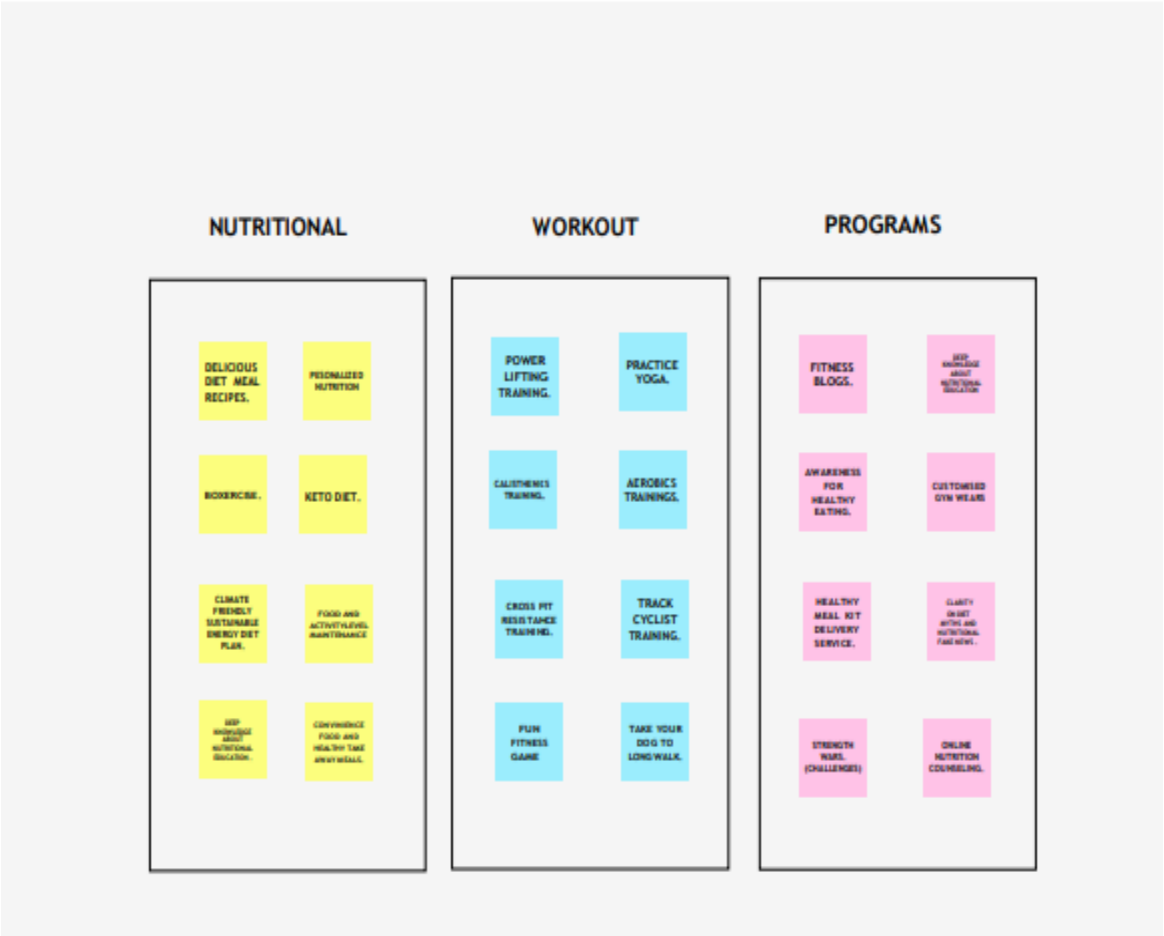
Share template feedback

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes



4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⏱ 20 minutes

Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

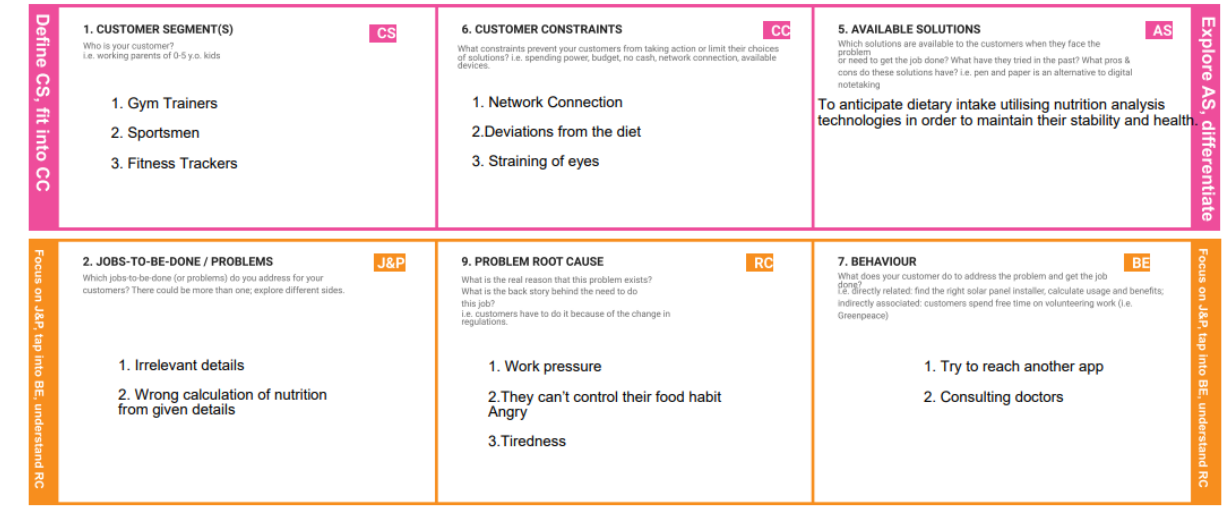
Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	In order to distinguish between fruits and vegetables based on colour, texture, shape, and other features, an ordinary human needs employ cutting-edge AI-based analysis software. The user must be informed of the nutritional value of that particular food at the moment of identification.
2.	Idea / Solution description	Main Solution: • Identification of the provided input data is accurate and clear. • Give nutritional information based on the collected information. • Analysis and upkeep of fitness based on the user's physical circumstances Additional benefits: • Analysis of daily dietary requirements • meticulously measuring daily nutritional intake.
3.	Novelty / Uniqueness	• The provision of bonus-added fitness plans • Home cures and easy fixes for common issues are suggested. • A diet tailored to each person's needs and health status. • Flexibility in diet is encouraged to encourage a nutritious and productive eating routine.
4.	Social Impact / Customer Satisfaction	• Healthy lifestyle development • Continuous calorie tracking produces a fitness attitude.
5.	Business Model (Revenue Model)	• Consultation with local nutritionists and trainers for customised strategies. • Adopt a specific diet under the guidance of a professional. • Promote and sell workout equipment and dietary supplements. • Promotion of hospitals and fitness facilities
6.	Scalability of the Solution	• Extending data collecting and increasing accuracy utilising user input data • The best way to store a certain meal • Everyone may use and profit from it because to its user-friendly UI.

3.4 Problem Solution fit

Project Title: AI-powered Nutrition Analyzer for Fitness Enthusiasts **Project Design Phase-I - Solution Fit Template** **Team ID: PNT2022TMID03893**



4. REQUIREMENT ANALYSIS

- Functional Requirements
- Non – Functional Requirements

4.1 FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login	Login through Google Login through Email
FR-5	Generate the daily plan	Daily plans will be generated by dietician
FR-6	Manage progress report	Gathering information from database and generating report
FR-7	Query	The user can ask for changes in plan

4.2 NON- FUNCTIONAL REQUIREMENTS

Non-functional Requirements:

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

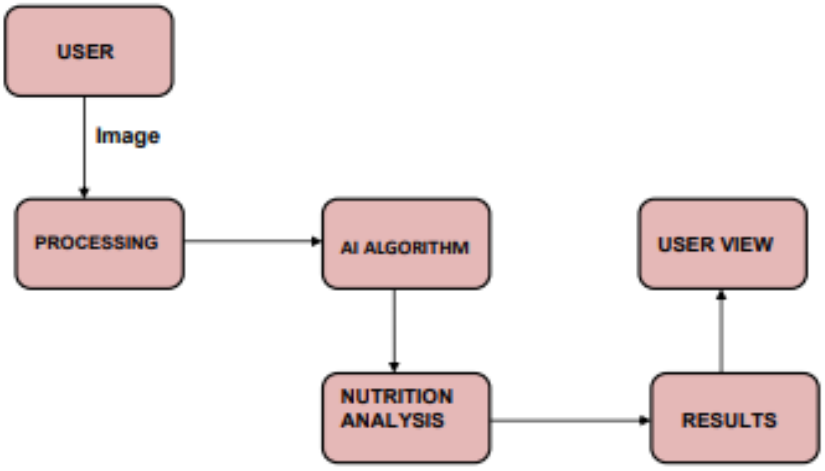
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Easy to use with interactive User Interface
NFR-2	**Security**	User can access only their personal information and not that of other users.
NFR-3	**Reliability**	The average time of failure shall be 7 days.
NFR-4	**Performance**	The results has to be shown within 10 sec
NFR-5	**Availability**	The dietician shall be available to users 24 hours a day, 7 days a week.
NFR-6	**Scalability**	Supports various food items

5. PROJECT DESIGN

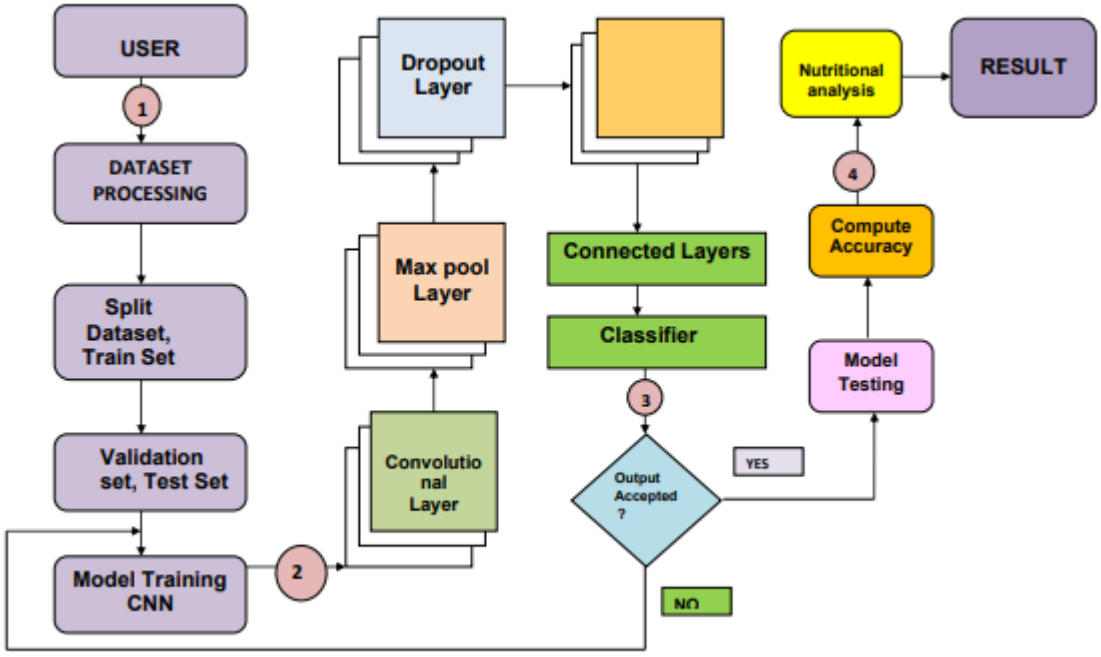
- The user interacts with the UI (User Interface) and give the image as input.
- Then the input image is then pass to our flask application,
- And finally with the help of the model which we build we will classify the result and showcase it on the UI.
- To accomplish this, we have to complete all the activities and tasks listed below
- Data Collection.
- Collect the dataset or Create the dataset
- **Data Preprocessing:**
    - ✓ Import the ImageDataGenerator library
    - ✓ Configure ImageDataGenerator class
    - ✓ ApplyImageDataGenerator functionality to Trainset and Testset
- Model Building
- Import the model building Libraries
- Initializing the model
- Adding Input Layer
- Adding Hidden Layer
- Adding Output Layer
- Configure the Learning Process
- Training and testing the model
- Save the Model
- Application Building
- Create an HTML fileBuild Python Code

5.1 DATA FLOW DIAGRAM

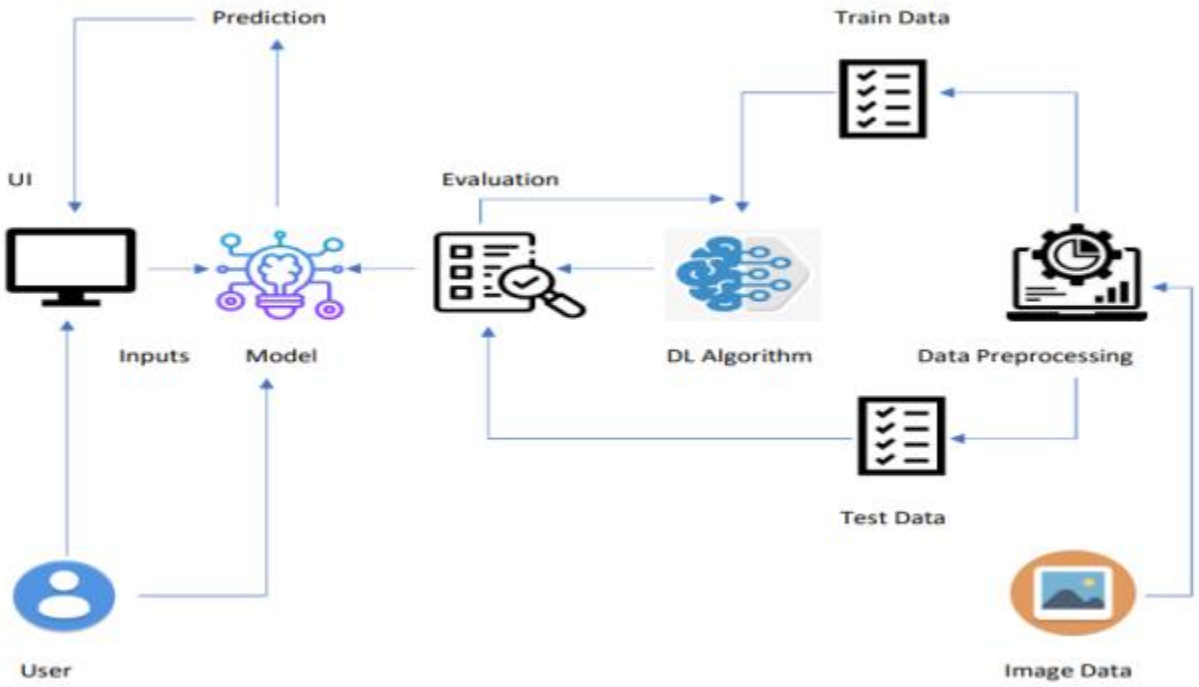
Level - 0



Level - 2



5.2 SOLUTION AND TECHNICAL ARCHITECTURE



S.No	Component	Description	Technology
1.	Application	User interacts with application for the prediction of Nutrition	Python, Java, HTML,SQL,Android studio,JavaScript,ReactJS,tailwindCSS
2.	Database	Data Type, Configurations and data will be stored	MySQL, JavaScript
3.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudland, etc
4.	File Storage	File storage requirements	The storage will be based on Cloud
5.	Machine Learning	Purpose of Machine Learning Model	ANN, CNN, RNN
6.	Notification	Notification will be sent from the server	SendGrid
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API	Purpose of External API used in the application	Aadhar API, Stripe
9.	Machine Learning Model	Purpose of Machine Learning Model	OpenCV, MATLAB
10.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration :	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	open-source frameworks used	SendGrid, Python, jQuery
2.	Security Implementations	Request authentication using encryption	Encryptions, SSL certs
3.	Scalable Architecture	The scalability of architecture consists of 3 tiers	Web Server – HTML, CSS, JavaScript Application Server – Python Flask Database Server – IBM Cloud
4.	Availability	Availability is increased by loads balancers in cloud VPS	IBM Cloud hosting
5.	Performance	The application is expected to handle up to 4000 predictions per second	IBM Load Balance

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web user)	Upload	USN-1	As a user, I can upload the image by gallery	I can uploaded the image	High	Sprit-1
Customer (Web User)	Upload	USN-2	As a user, I can upload the image by take image using camera	I can upload the image	Low	Sprit-2
Customer (Web User)	Registration	USN-3	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account	High	Sprit-1
Customer (Web User)	Login	USN-4	As a user, I can log into the application by entering email & password	I can access my account	High	Sprit-1
Customer Care Executive	Enquiry/Customer services	USN-1	As a customer care executive, I can get the feedback and make report	I can interact with user	Medium	Sprit-1
Administrator	update	USN-1	As a administrator, I can update the performance	I can update and give more functionality	Medium	Sprit-1
Administrator	Add information	USN-2	As a administrator, I can add some extra information about the services	I can improve the access	Low	Sprit-2
Maintenance Team	Maintenance	USN-1	As a member, maintain the any technical problems or the any other issues in the system	I can maintaining the services	High	Sprit-1

6. PROJECT PLANNING & SCHEDULING

Human survival depends on food, which is why it has been a topic of discussion at numerous medical conventions. Today's advancements in dietary analysis and assessment tools provide more chances for people to explore nutrition patterns, understand their daily eating habits, and maintain a balanced diet. The technique of figuring out what nutrients are in food is called nutritional analysis. Building a model that can be used to categorize fruits according to their various attributes, such as colour, shape, and texture, is the project's major goal. Here, users can take pictures of various fruits, and the pictures will subsequently be sent to a trained model. The model examines the image and determines the nutrition based on fruits

6.1 SPRINT PLANNING & ESTIMATION

Project planning gives the execution phase organization and foresight, assisting in the abolition of unproductive practices and routines. It entails developing a set of plans to lead your team through the project's implementation and closure phases. You will be able to manage time, cost, quality, modifications, risk, and associated

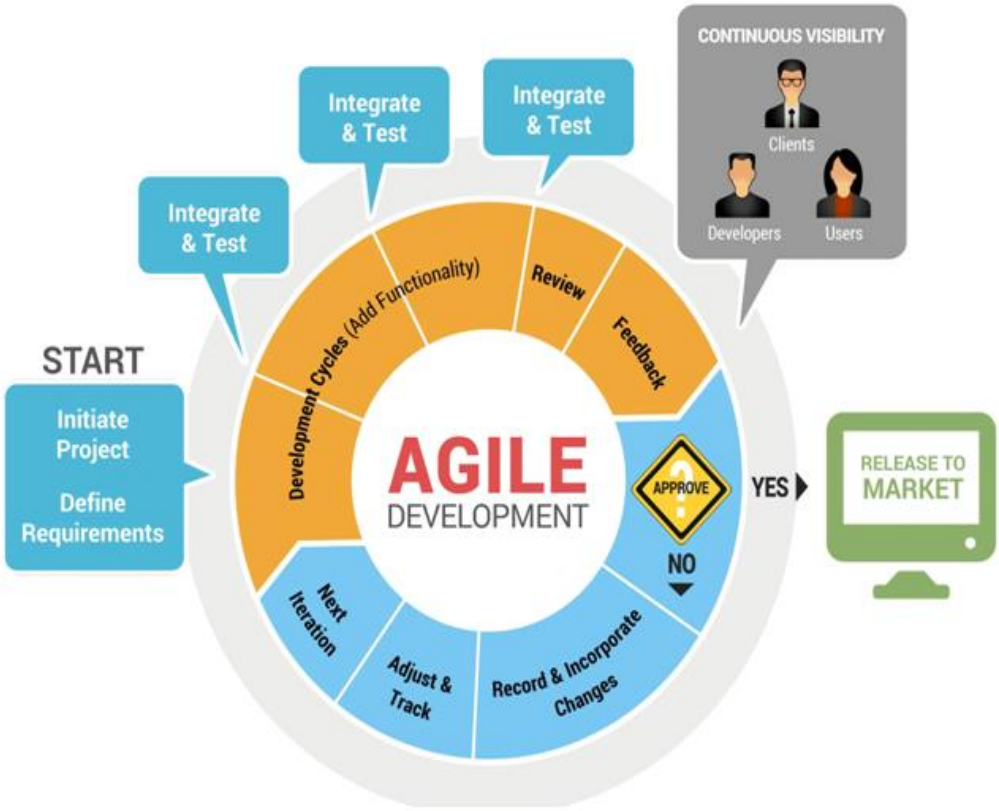
problems thanks to the plans made during this phase. We can split into four steps of phase are:

Phrase 1 : Collection of data and analysis of requirements.

Phrase 2 : Modules for project development and planning.

Phrase 3 : Use the High Accuracy Deep Learning Algorithm to carry out your task.

Phrase 4 : Deploying models on the cloud and testing how well they work with the user interface.



6.2 SPRINT DELIVERY SCHEDULE

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by Entering my email, password, and confirming my password.	5	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-2		USN-2	As a user, I will receive confirmation email once I have registered for the application	4	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-1		USN-3	As a user, I can register for the application through Gmail	5	Medium	MADHAVAN MEHA NEERAJ NANDHINI

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login	USN-4	As a user, I can log into the application by entering email & password	5	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-1	Dashboard	USN-5	As a user I can access the dashboard able to see options to view contents chart, select diet plans, and exercise	5	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-2		USN-6	As a user I can see my profile	4	Medium	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-3		USN-7	As a user I can update my profile	3	Low	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-2		USN-8	As a user I can change my password	4	Medium	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-1	Service Request	USN-9	As a user I can request to display nutrition content of food items	5	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-2		USN-10	As a user I can request to suggest a diet plan according to my medical details	4	High	MADHAVAN MEHA NEERAJ NANDHINI

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2		USN-11	As a user I can request to suggest exercise routines according to my medical details	4	Medium	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-3	Notification	USN-12	track the status of diet targets through a dashboard or email services	3	Low	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-3		USN-13	As a user get an email about revised exercise routines based on recent records.	3	Medium	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-1		USN-14	A user noticed after successfully achieved the target workout	5	High	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-3		USN-15	Upload Progress Reports	3	Low	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-4		USN-16	Making UI more interactive	2	Low	MADHAVAN MEHA NEERAJ NANDHINI
Sprint-2		USN-17	As a user I give feedback	4	High	MADHAVAN MEHA NEERAJ NANDHINI

Project Tracker, Velocity & Burndown Chart:

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		
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022		
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022		

Velocity:

$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

7. CODING & SOLUTIONING

Hardware Specifications:

- Windows (minimum 10), Mac & Linux
- Ram - 4GB (minimum)
- Hard Disk - 100GB (minimum)
- Processor - Intel i3 (minimum), Mac M1

Software Specifications:

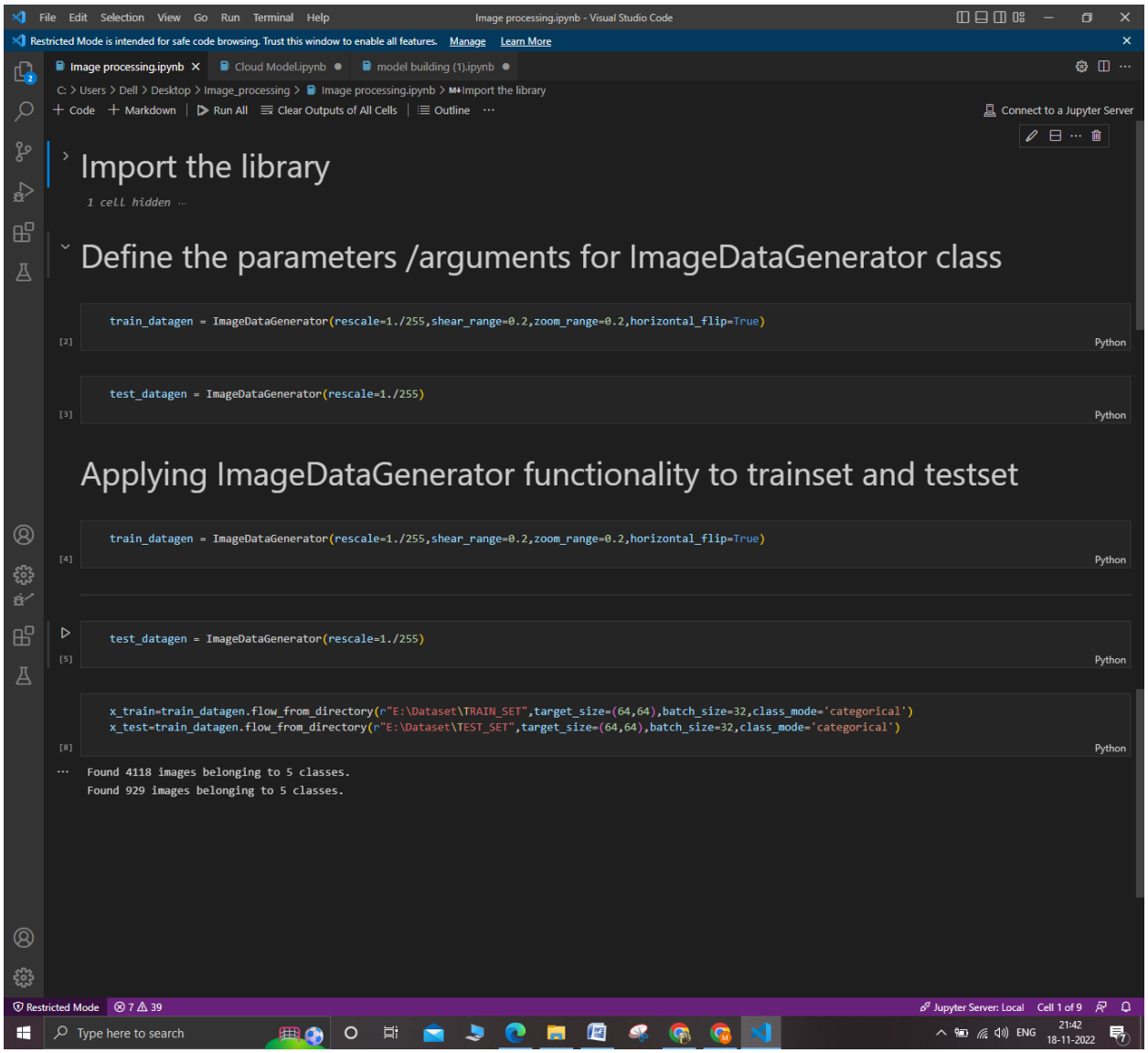
- Anaconda Navigator - https://www.anaconda.com/products/distribution
- Jupyter notebook.
- Google Colab - https://colab.research.google.com/
- Spyder / VS Code / Pycharm

IBM:

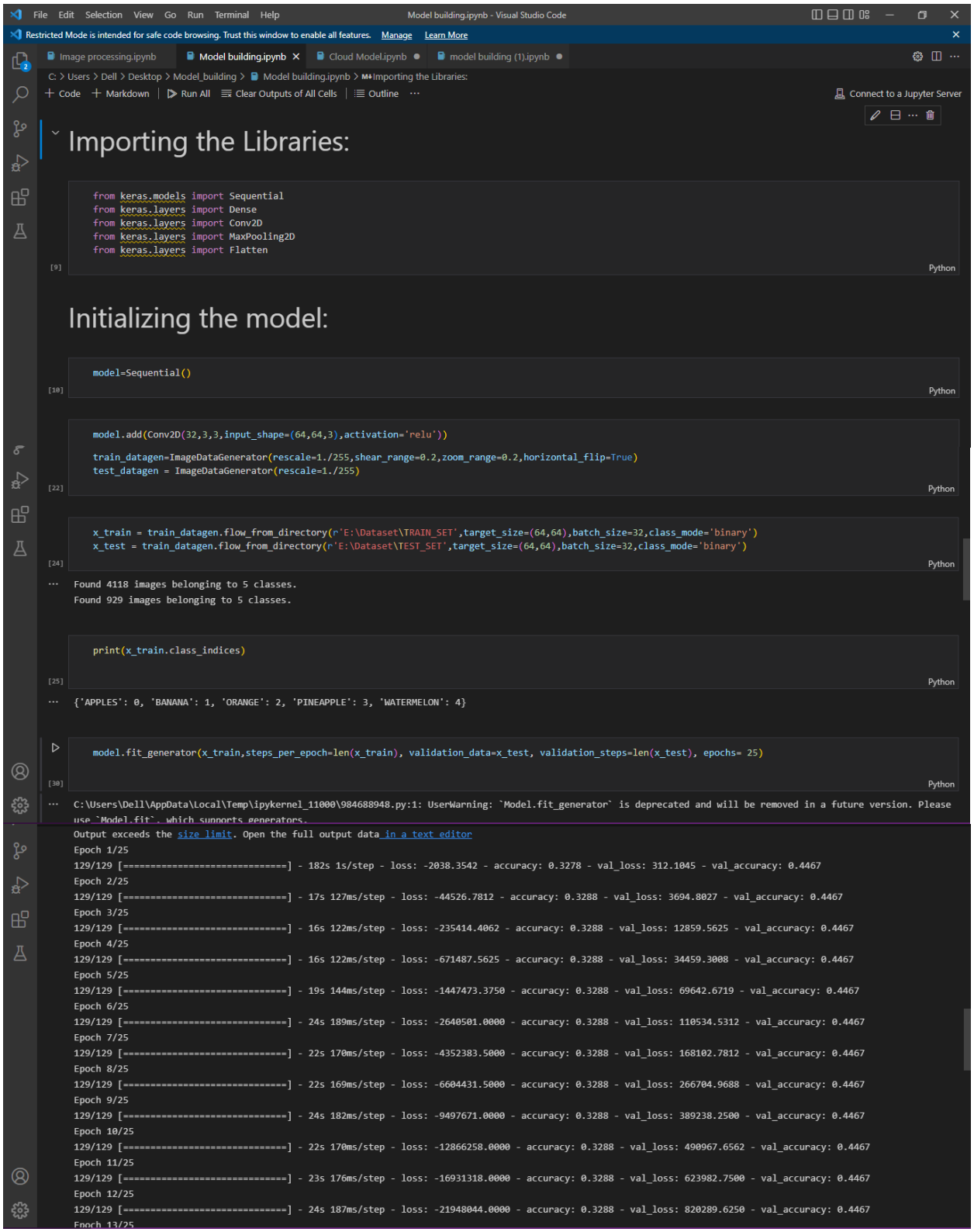
- IBM Account Creation - https://vimeo.com/742609168/1824d26a5b (Follow this video for IBM Skill Build Account Creation)
- IBM Skill Build - https://www.ibm.com/academic/home
- Webmail - https://sg2plmcpnl492529.prod.sin2.secureserver.net:2096/
- IBM Cloud - https://cloud.ibm.com/login

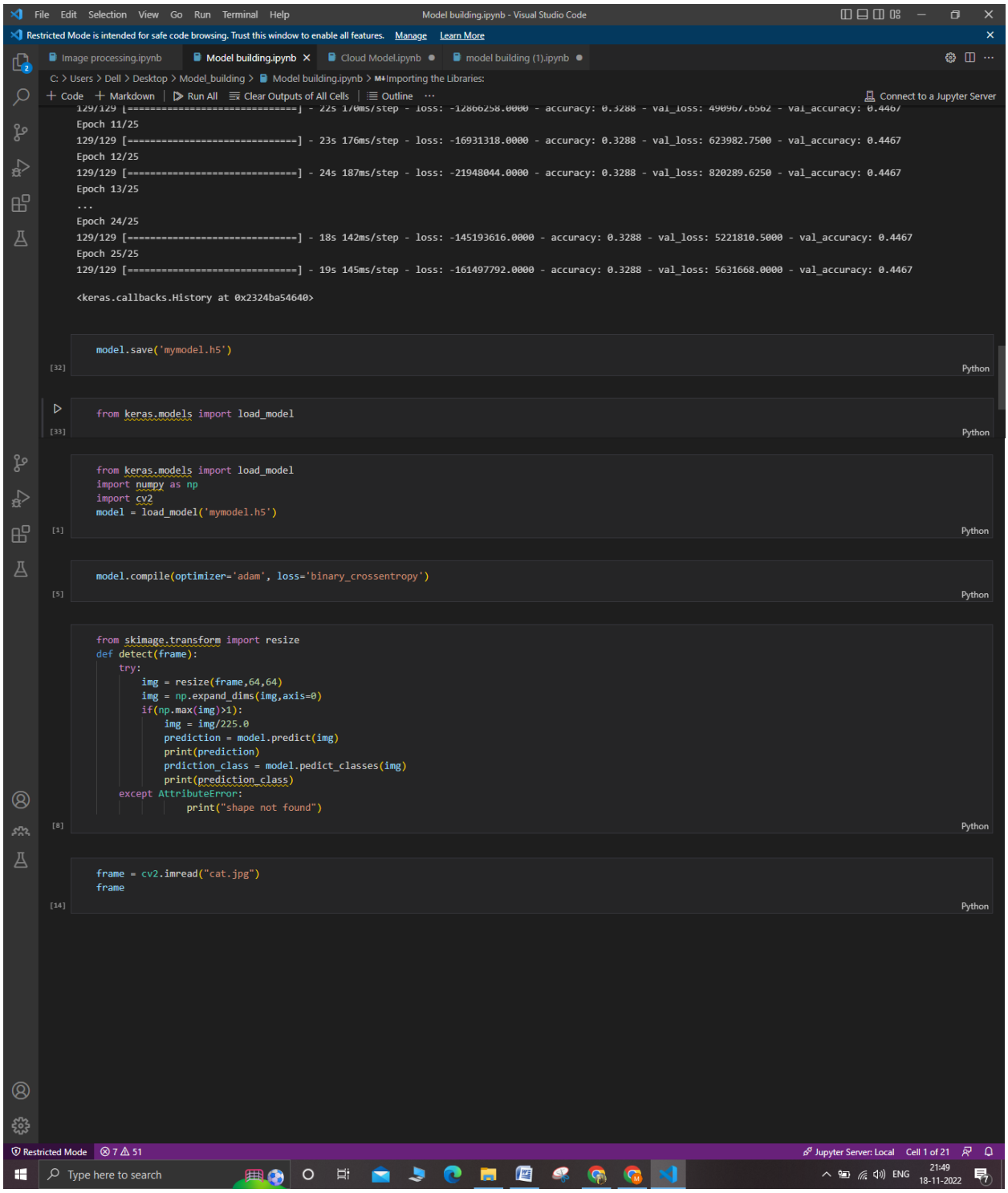
7.1 FEATURE 1

IMAGE PROCESSING



MODEL BUILDING



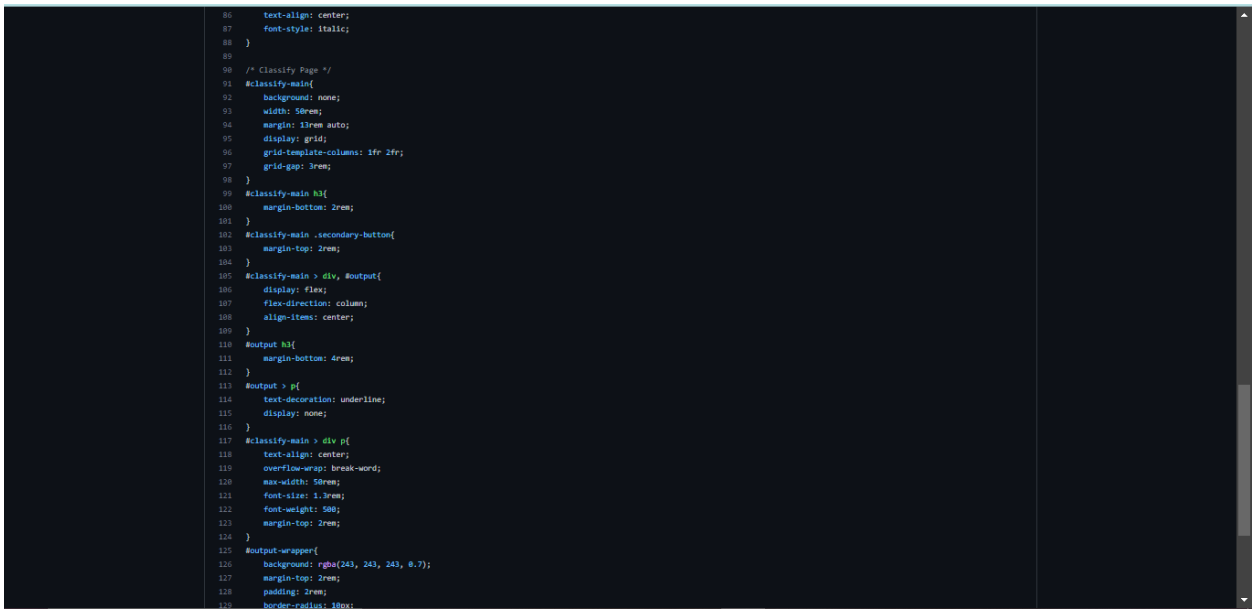

File Edit Selection View Go Run Terminal Help
Model building.ipynb - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More
Image processing.ipynb
Model building.ipynb
Cloud Model.ipynb
model building (1).ipynb
C: > Users > Dell > Desktop > Model_building > Model building.ipynb > Importing the Libraries:
Code Markdown Run All Clear Outputs of All Cells Outline
Connect to a Jupyter Server
Epoch 11/25
129/129 [==============================] - 23s 176ms/step - loss: -16931318.0000 - accuracy: 0.3288 - val_loss: 623982.7500 - val_accuracy: 0.4467
Epoch 12/25
129/129 [==============================] - 24s 187ms/step - loss: -21948044.0000 - accuracy: 0.3288 - val_loss: 820289.6250 - val_accuracy: 0.4467
Epoch 13/25
...
Epoch 24/25
129/129 [==============================] - 18s 142ms/step - loss: -145193616.0000 - accuracy: 0.3288 - val_loss: 5221810.5000 - val_accuracy: 0.4467
Epoch 25/25
129/129 [==============================] - 19s 145ms/step - loss: -161497792.0000 - accuracy: 0.3288 - val_loss: 5631668.0000 - val_accuracy: 0.4467
<keras.callbacks.History at 0x2324ba54640>
model.save('mymodel.h5')
[32]
Python
from keras.models import load_model
[33]
Python
from keras.models import load_model
import numpy as np
import cv2
model = load_model('mymodel.h5')
[1]
Python
model.compile(optimizer='adam', loss='binary_crossentropy')
[5]
Python
from skimage.transform import resize
def detect(frame):
try:
img = resize(frame,64,64)
img = np.expand_dims(img,axis=0)
if(np.max(img)>1):
img = img/225.0
prediction = model.predict(img)
print(prediction)
prdiction_class = model.pedict_classes(img)
print(prediction_class)
except AttributeError:
print("shape not found")
[8]
Python
frame = cv2.imread("cat.jpg")
frame
[14]
Python
Restricted Mode
Jupyter Server: Local
Cell 1 of 21
Type here to search
ENG
21:49
18-11-2022

FEATURE – 2

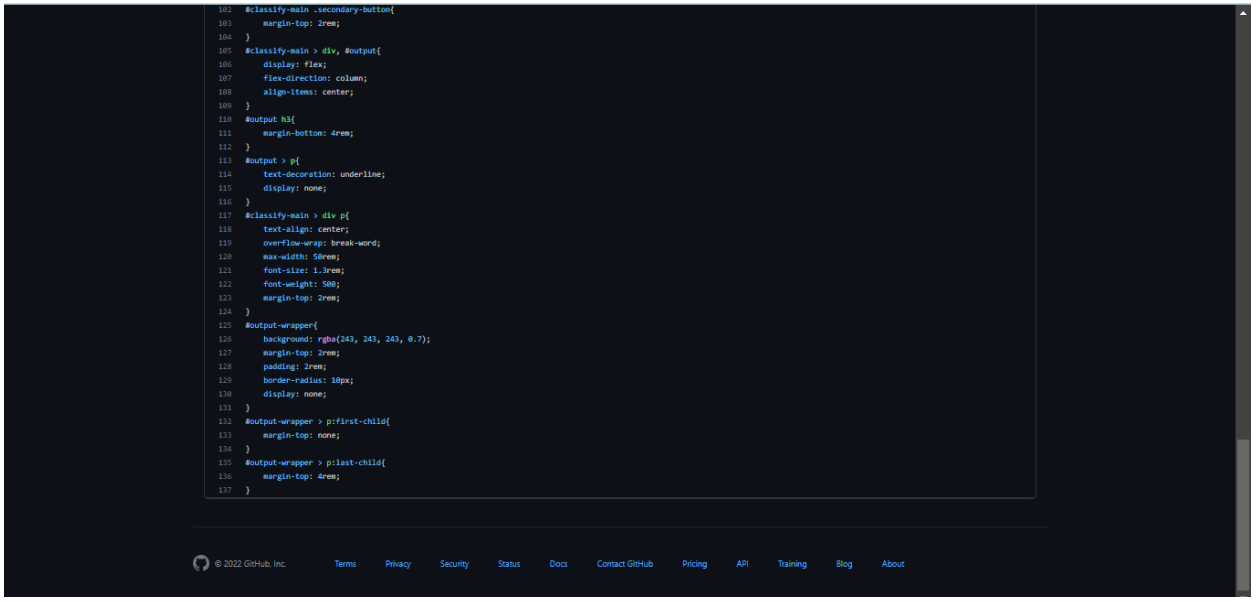
CSS

```css
*{
    box-sizing: border-box;
    margin: 0;
    padding: 0;
}
:root{
    --primary-color: lightgreen;
    --primary-color-opacity: rgba(144, 238, 144, 0.8);
}
body{
    background: url("../images/fruits.jpg") no-repeat center top/cover;
    font-family:'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
}
ul{
    list-style: none;
}
a{
    text-decoration: none;
}

/* Classes */
.page-selected{
    background: var(--primary-color);
    color: white;
}
.page-selected a{
    color: white;
}
.primary-button, .secondary-button{
    padding: 0.8rem;
    font-size: 1.2rem;
    border: none;
    color: white;
    font-weight: 500;
    border-radius: 5px;
}
.primary-button{
    background: var(--primary-color);
}
.secondary-button{
    background: rgb(50, 50, 200);
}
.primary-button:hover, .secondary-button:hover{
```

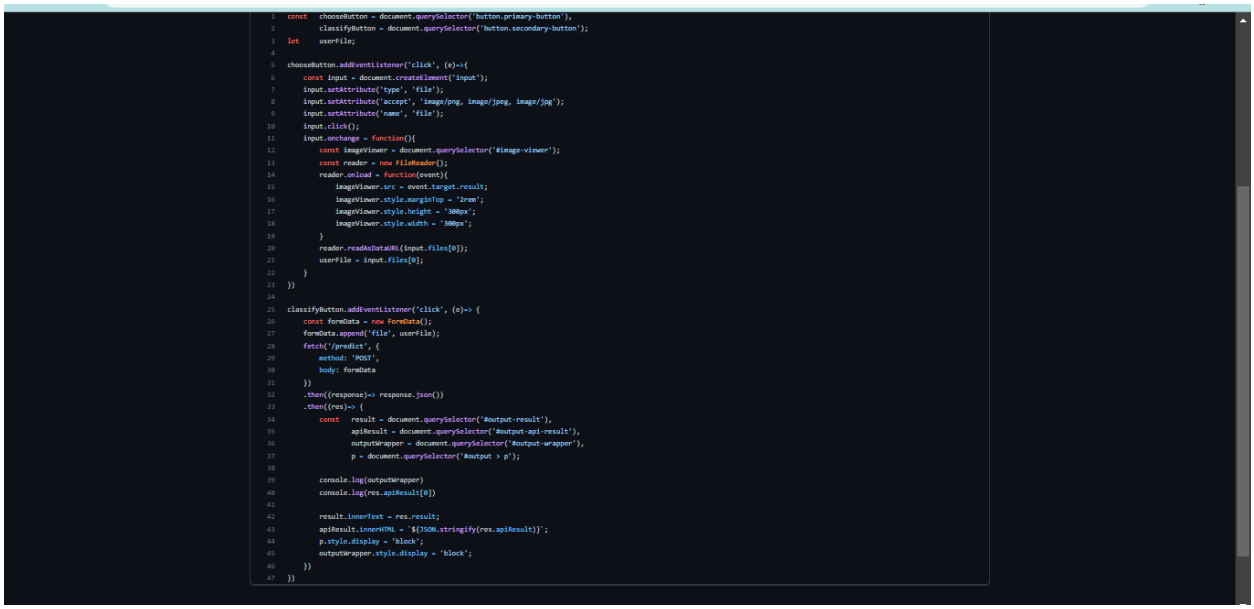
```javascript
const   chooseButton = document.querySelector('button.primary-button'),
        classifyButton = document.querySelector('button.secondary-button');
let     userFile;

chooseButton.addEventListener('click', (e)=>{
    const input = document.createElement('input');
    input.setAttribute('type', 'file');
    input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
    input.setAttribute('name', 'file');
    input.click();
    input.onchange = function(){
        const imageViewer = document.querySelector('#image-viewer');
        const reader = new FileReader();
        reader.onload = function(event){
            imageViewer.src = event.target.result;
            imageViewer.style.marginTop = '2rem';
            imageViewer.style.height = '300px';
            imageViewer.style.width = '300px';
        }
        reader.readAsDataURL(input.files[0]);
        userFile = input.files[0];
    }
})

classifyButton.addEventListener('click', (e)=> {
    const formData = new FormData();
    formData.append('file', userFile);
    fetch('/predict', {
        method: 'POST',
        body: formData
    })
    .then((response)=> response.json())
    .then((res)=> {
        const   result = document.querySelector('#output-result'),
                apiResult = document.querySelector('#output-api-result'),
                outputWrapper = document.querySelector('#output-wrapper'),
                p = document.querySelector('#output > p');

        console.log(outputWrapper)
        console.log(res.apiResult[0])

        result.innerText = res.result;
        apiResult.innerHTML = `${JSON.stringify(res.apiResult)}`;
        p.style.display = 'block';
        outputWrapper.style.display = 'block';
    })
})
```



```
    text-align: center;
    font-style: italic;
}

/* Classify Page */
#classify-main{
    background: none;
    width: 50rem;
    margin: 13rem auto;
    display: grid;
    grid-template-columns: 1fr 2fr;
    grid-gap: 3rem;
}
#classify-main h3{
    margin-bottom: 2rem;
}
#classify-main .secondary-button{
    margin-top: 2rem;
}
#classify-main > div, #output{
    display: flex;
    flex-direction: column;
    align-items: center;
}
#output h3{
    margin-bottom: 4rem;
}
#output > p{
    text-decoration: underline;
    display: none;
}
#classify-main > div p{
    text-align: center;
    overflow-wrap: break-word;
    max-width: 50rem;
    font-size: 1.3rem;
    font-weight: 500;
    margin-top: 2rem;
}
#output-wrapper{
    background: rgba(243, 243, 243, 0.7);
    margin-top: 2rem;
    padding: 2rem;
    border-radius: 10px;
```

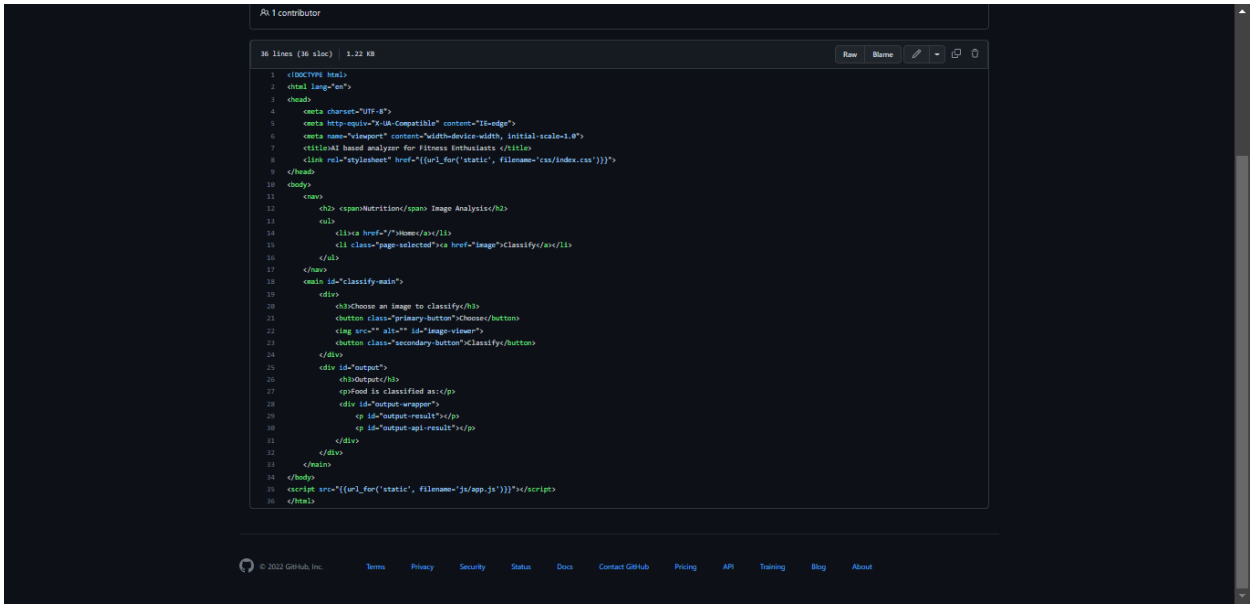


```
#classify-main .secondary-button{
    margin-top: 2rem;
}
#classify-main > div, #output{
    display: flex;
    flex-direction: column;
    align-items: center;
}
#output h3{
    margin-bottom: 4rem;
}
#output > p{
    text-decoration: underline;
    display: none;
}
#classify-main > div p{
    text-align: center;
    overflow-wrap: break-word;
    max-width: 50rem;
    font-size: 1.3rem;
    font-weight: 500;
    margin-top: 2rem;
}
#output-wrapper{
    background: rgba(243, 243, 243, 0.7);
    margin-top: 2rem;
    padding: 2rem;
    border-radius: 10px;
    display: none;
}
#output-wrapper > p:first-child{
    margin-top: none;
}
#output-wrapper > p:last-child{
    margin-top: 4rem;
}
```



```
const   chooseButton = document.querySelector('button.primary-button'),
        classifyButton = document.querySelector('button.secondary-button');
let     userFile;

chooseButton.addEventListener('click', (e)=>{
    const input = document.createElement('input');
    input.setAttribute('type', 'file');
    input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
    input.setAttribute('name', 'file');
    input.click();
    input.onchange = function(){
        const imageViewer = document.querySelector('#image-viewer');
        const reader = new FileReader();
        reader.onload = function(event){
            imageViewer.src = event.target.result;
            imageViewer.style.marginTop = '2rem';
            imageViewer.style.height = '300px';
            imageViewer.style.width = '300px';
        }
        reader.readAsDataURL(input.files[0]);
        userFile = input.files[0];
    }
})

classifyButton.addEventListener('click', (e)=> {
    const formData = new FormData();
    formData.append('file', userFile);
    fetch('/predict', {
        method: 'POST',
        body: formData
    })
    .then((response)=> response.json())
    .then((res)=> {
        const   result = document.querySelector('#output-result'),
                apiResult = document.querySelector('#output-api-result'),
                outputWrapper = document.querySelector('#output-wrapper'),
                p = document.querySelector('#output > p');

        console.log(outputWrapper)
        console.log(res.apiResult[0])

        result.innerText = res.result;
        apiResult.innerHTML = `${JSON.stringify(res.apiResult)}`;
        p.style.display = 'block';
        outputWrapper.style.display = 'block';
    })
})
```

HTML



1 contributor

36 lines (36 sloc) | 1.22 KB

Raw Blame

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>AI based analyzer for Fitness Enthusiasts </title>
    <link rel="stylesheet" href="{{url_for('static', filename='css/index.css')}}">
</head>
<body>
    <nav>
        <h2> <span>Nutrition</span> Image Analysis</h2>
        <ul>
            <li><a href="/">Home</a></li>
            <li class="page-selected"><a href="image">Classify</a></li>
        </ul>
    </nav>
    <main id="classify-main">
        <div>
            <h3>Choose an image to classify</h3>
            <button class="primary-button">Choose</button>
            <img src="" alt="" id="image-viewer">
            <button class="secondary-button">Classify</button>
        </div>
        <div id="output">
            <h3>Output</h3>
            <p>Food is classified as:</p>
            <div id="output-wrapper">
                <p id="output-result"></p>
                <p id="output-api-result"></p>
            </div>
        </div>
    </main>
</body>
<script src="{{url_for('static', filename='js/app.js')}}"></script>
</html>
```

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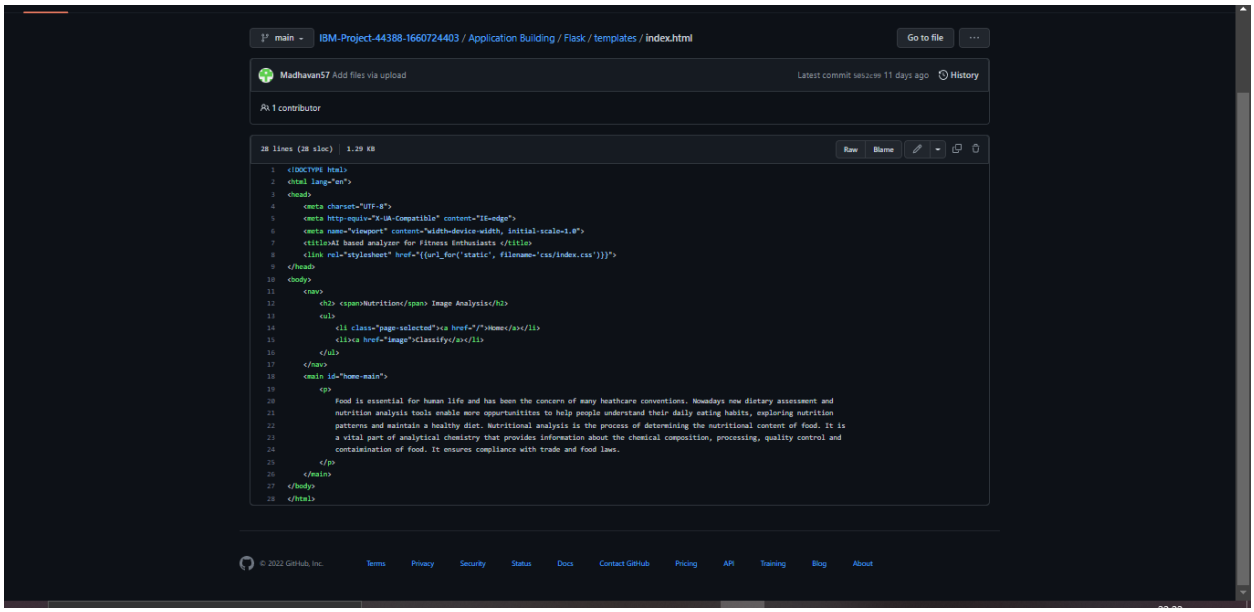
main
IBM-Project-44388-1660724403 / Application Building / Flask / templates / index.html
Go to file
Madhavan57 Add files via upload
Latest commit 5a52c99 11 days ago
History
1 contributor
28 lines (28 sloc) 1.29 KB
Raw
Blame
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>AI based analyzer for Fitness Enthusiasts </title>
<link rel="stylesheet" href="{{url_for('static', filename='css/index.css')}}">
</head>
<body>
<nav>
<h2> Nutrition Image Analysis</h2>

<li class="page-selected">Home
Classify

</nav>
<main id="home-main">

Food is essential for human life and has been the concern of many healthcare conventions. Nowadays new dietary assessment and
nutrition analysis tools enable more opportunitites to help people understand their daily eating habits, exploring nutrition
patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is
a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and
contamination of food. It ensures compliance with trade and food laws.

</main>
</body>
</html>
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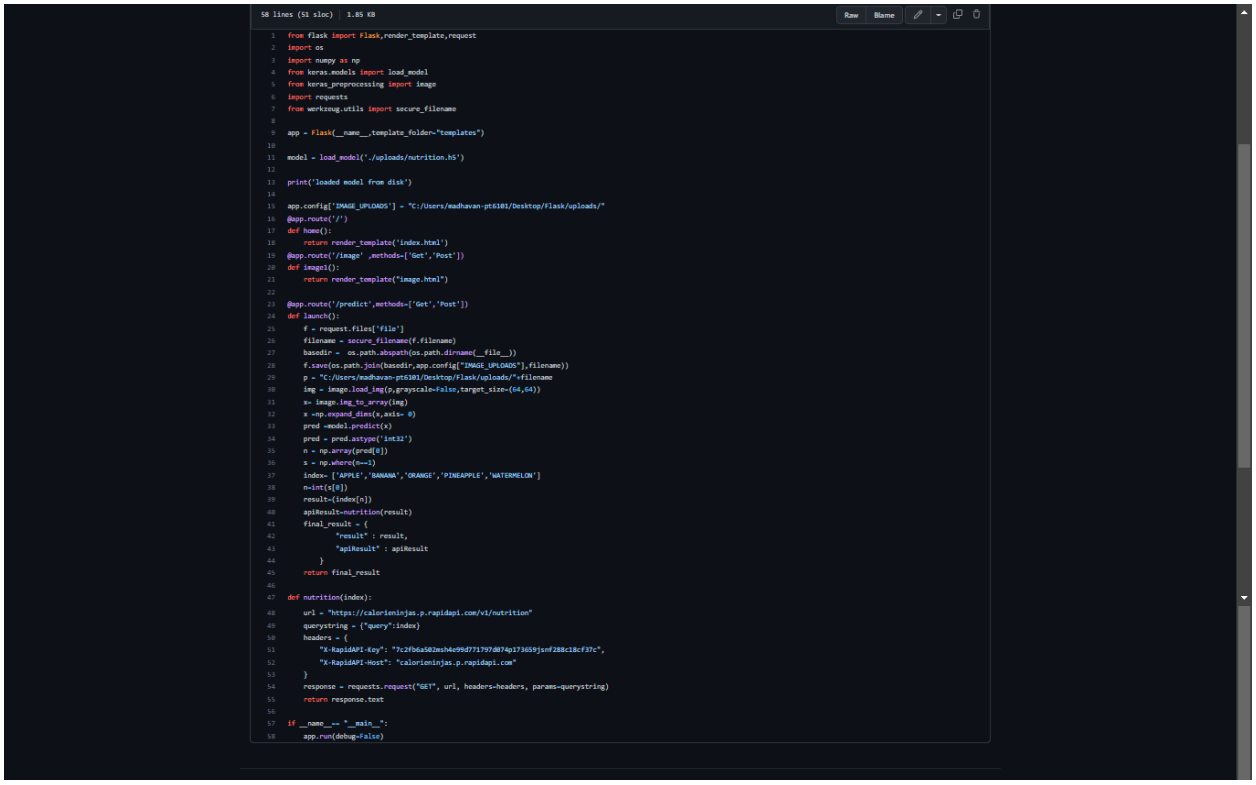
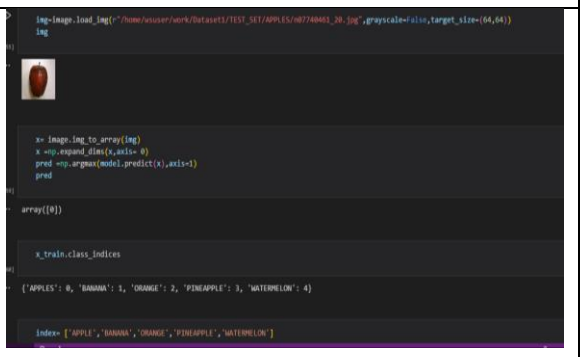
APP.PY


58 lines (51 sloc) 1.85 KB
Raw
Blame
from flask import Flask,render_template,request
import os
import numpy as np
from keras.models import load_model
from keras.preprocessing import image
import requests
from werkzeug.utils import secure_filename
app = Flask(__name__,template_folder="templates")
model = load_model('./uploads/nutrition.h5')
print('loaded model from disk')
app.config['IMAGE_UPLOADS'] = "C:/Users/madhavan-pt6101/Desktop/Flask/uploads/"
@app.route('/')
def home():
return render_template('index.html')
@app.route('/image' ,methods=['Get','Post'])
def image1():
return render_template("image.html")
@app.route('/predict',methods=['Get','Post'])
def launch():
f = request.files['file']
filename = secure_filename(f.filename)
basedir = os.path.abspath(os.path.dirname(__file__))
f.save(os.path.join(basedir,app.config["IMAGE_UPLOADS"],filename))
p = "C:/Users/madhavan-pt6101/Desktop/Flask/uploads/"+filename
img = image.load_img(p,grayscale=False,target_size=(64,64))
x= image.img_to_array(img)
x =np.expand_dims(x,axis= 0)
pred =model.predict(x)
pred = pred.astype('int32')
n = np.array(pred[0])
s = np.where(n==1)
index= ['APPLE','BANANA','ORANGE','PINEAPPLE','WATERMELON']
n=int(s[0])
result=(index[n])
apiResult=nutrition(result)
final_result = {
"result" : result,
"apiResult" : apiResult
}
return final_result
def nutrition(index):
url = "https://calorieninjas.p.rapidapi.com/v1/nutrition"
querystring = {"query":index}
headers = {
"X-RapidAPI-Key": "7c2fb6a502msh4e99d771797d074p173659jsnf288c18cf37c",
"X-RapidAPI-Host": "calorieninjas.p.rapidapi.com"
}
response = requests.request("GET", url, headers=headers, params=querystring)
return response.text
if __name__== "__main__":
app.run(debug=False)

\

8. TESTING

Test case ID	Feature type	Test Scenario	Execution	Expected output	Actual Output	Status
Input of Food or fruit	Functional	User interacts with application for the prediction of Nutrition	HTML,CSS JavaScript.	Display the webpage result in chrome	Working as expected	Pass
Object Storage	Functional	IBM Block Storage or Other Storage Service or Local File system	The storage will be based on Cloud	Display the images from the test and train datasets	Working as expected	Pass
Nutritional Analyser	Functional	Application Deployment on Local System/ Cloud Local Server Configuratin: Cloud Server Configuratin:	Using nutitional analyser we Gather information from database and generate report	The AI nutrition analyser has to generate report based on the food input given by the user.	Working as expected	Pass

S.No.	Parameter	Values	Screenshot
1.	Cloud Object Storage	The image was working with the accuracy of 100% with matched products and expected output was obtained	
2.	At Watson studio	Datasets are trained successfully and expected output was obtained	

9. RESULT

- This model will be useful for every category people irrespective of age and gender.
- Using this model we'll know the exact amount of nutritional content in the food we have which is very useful as it is very important to take care of one's health.
- It takes input as image and uses machine learning and deep learning algorithms to analyze the nutritional content in the food and calories in it.

9.1 PERFORMANCE METRICS

- Clear and proper identification of the given input data.
- Provide nutritional facts based on the obtained data.

- Fitness analysis and maintenance as per the user's body conditions Additional benefits:
- Analysis of daily dietary requirements
- Daily tracking of dietary consumption thoroughly.
- The availability of fitness plans with addon bonuses
- Suggestion of home remedies and simple solutions for basic problems.
- An individualized food plan based on health condition and deficiency.
- Allowing for diet flexibility helps promote a healthy and effective eating pattern.
- Healthy lifestyle development
- Constant calorie management monitoring results in a fitness mindset.

- Improving accuracy by expanding the data collection using user input data
- Storage requirements of a specific food.
- User friendly UI for everyone to use and get benefit from it
- The application is expected to handle up to 4000 predictions per second.

10. ADVANTAGES AND DISADVANTAGES

Pros :

- **You can see how many calories and proteins are in each fruit.**
- **You can learn which fruits have more calories and proteins.**
- **You can find out which fruits are good for you.**
- **You can get a list of the fruits that have the most calories and proteins.**
- **You can see how many calories and proteins you need to eat each day.**

- **It can help you to maintain a balanced diet.**
- **It can help you to lose weight.**
- **It can help you to gain muscle.**
- **It is easy to use.**
- **It is accurate.**
- **It can help you to understand the nutritional value of fruit and how it can benefit your health.**
- **It can help you to make healthier choices when it comes to snacking or meals.**
- **It is a quick and easy way to get information on the calorie and protein content of fruit.**
- **It is a handy tool for dietitians, nutritionists, and other health professionals.**
- **It can be used as a teaching aid in schools and universities.**

Cons:

- **It doesn't show you the nutritional information for other food groups.**
- **It only gives you the information for one day at a time.**
- **You have to enter the data manually**
- **It is not always reliable.**
- **It takes time to use it properly**
- **It can only analyse fruit and not other food items.**
- **It requires batteries to operate which may not be readily available all the time.**

11. CONCLUSION

This study proposed an Intelligence Precision Nutrient Analysis Model based on a digital data collection framework, where the nutrient intake was analyzed by entering dietary recall data. The AI Precision Nutrient Analysis Model was used to analyze the ingredients of the dishes and calculate nutrient intake by automatically analyzing the dishes, and portion sizes were analyzed using a digital data semantic analysis model. The results of this study show very little difference in nutrient intake between the model and the NNHS analysis and are highly accurate; therefore, the AI model can be used as a reference for nutrition surveys and personal nutrition analysis. In terms of data access, as there is not yet a complete set of publicly available data on food nutrient ingredients; more complete data and references on micro-nutrients should be available in the future. On the other hand, the scope of recipes should be expanded. Author Contributions: The work presented in this paper was carried out in collaboration among all authors. H.-A.L. and C.-Y.L. formed the conception and study design. K.-W.C. and C.-Y.L. carried out the data analysis; H.-A.L. performed the literature review; C.-Y.L., T.-T.H., L.-H.Y., P.-H.W., and H.-H.K. performed the model development; H.-A.L., P.-H.W., and K.-W.C. drafted the manuscript, and C.-Y.H. made significant revisions and supplied valuable improvement suggestions. All authors have read and agreed to the published version of the manuscript.

12. FUTURE SCOPE

People are increasingly turning to technology to help them with wellness and fitness problems. Many fitness apps, gym management software, gadgets, and wearables are entering the market and creating all the buzz.

In fact, a recent report by Research N Reports revealed that the value of the global fitness technology market is estimated to grow from $17.9 billion in 2019 to $62.1 billion by 2025. You may not realize, but every year, artificial intelligence (AI) is assimilating deeper into our lifestyle.

AI In Fitness

It shouldn't come as a surprise when I say that artificial intelligence has become an indispensable part of the fitness industry. Whether or not your health club uses AI, but AI is revolutionizing the health industry. From improving marketing and sales decisions, AI is now also being used to reshape individual habits. For instance, AI can easily track health behaviors and repetitive exercise patterns and use the data to guide you towards your fitness journey.

How AI Can Benefit The Fitness Industry

The benefits of AI in fitness is enormous. Here are a few of the latest trends in the fitness industry.

1. AI-Based Personal Trainer

The next big thing in the fitness industry will be AI-based personal trainer. What does it even mean? In simple terms, apps driven by artificial intelligence to help you achieve your fitness goals. These apps are so designed that they can offer personalized fitness and lifestyle plans. These apps are powered by AI that helps

tailor individual fitness plans based on your goals, eating habits, current fitness level, data from wearable devices, and much more. Not only that, but you would also find apps that can check your workout form and correct you, just like a trainer would do. You will need to use your phone's camera, and you can have a one-on-one setting and get real-time feedback on your workout posture. For instance, if you are doing a squat, it will correct you if you are extending your knees too far, or your legs are placed too close.

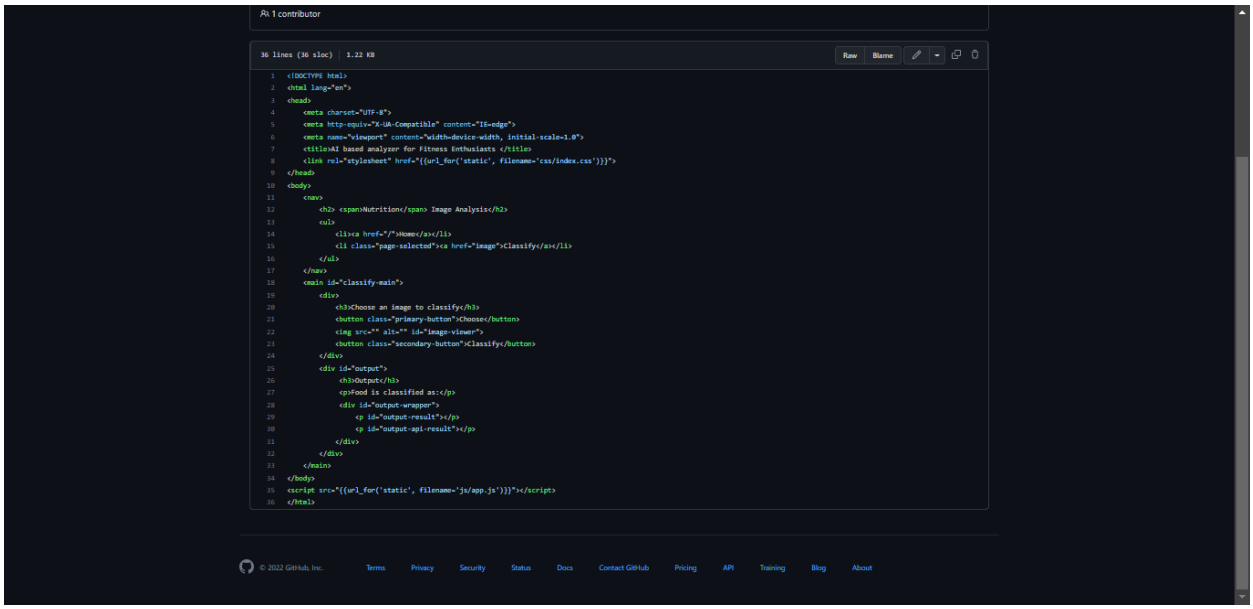
2. Smarter Fitness Wearables

Another trending application of AI in fitness is that it is making your wearable devices smarter. This Apple Watch or Fitbit, which you might already use, is moving towards more than just collecting data. They are now being tuned to detect your irregular heartbeats that might lead to a stroke or detect signs of diabetes. In fact, these wearables will soon be able to connect with your electronic medical reports to give you a complete view of your profile. These smart wearables are so designed that it can keep records of how you have improved or the time you have spent exercising. You can easily share these data with your coaches using the devices. Soon enough, the gym will act as a virtual assistant, whereby it will be able to provide even more specific instructions to its members. For instance, it can guide you on the number of reps you need to perform. In short, it will be able to offer more specific and personalized suggestions to improve some habits that require some changes. Clearly, every fitness enthusiast is going to get benefitted from these wearable devices.

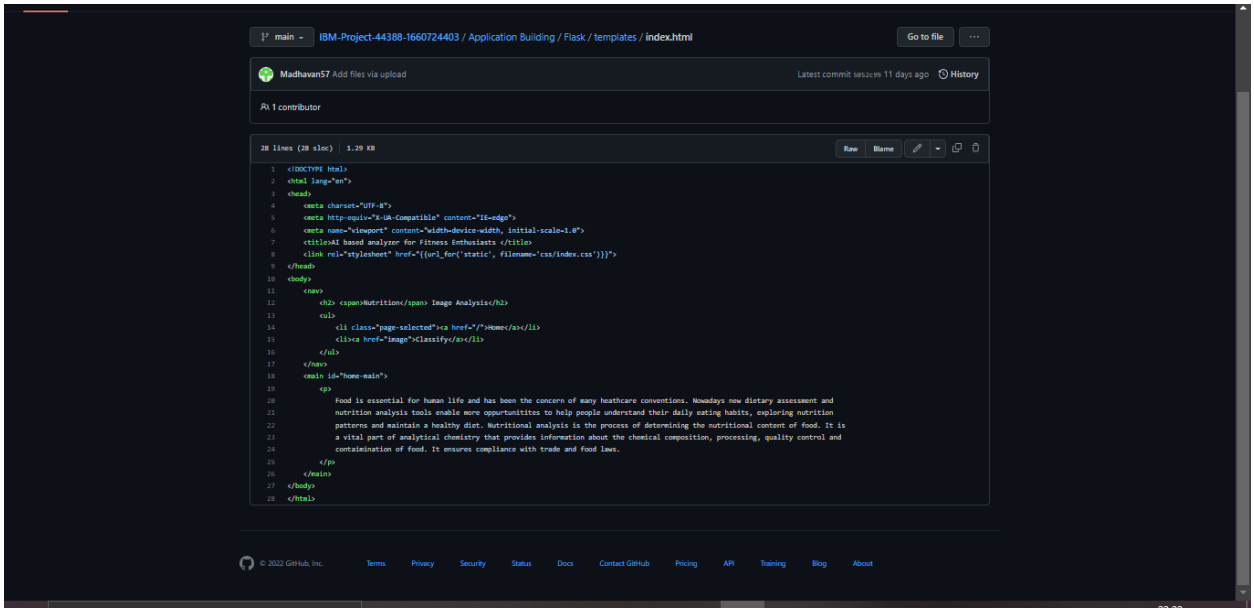
13 . APPENDIX

Source code

HTML



```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>AI based analyzer for Fitness Enthusiasts </title>
    <link rel="stylesheet" href="{{url_for('static', filename='css/index.css')}}">
</head>
<body>
    <nav>
        <h2> <span>Nutrition</span> Image Analysis</h2>
        <ul>
            <li><a href="/">Home</a></li>
            <li class="page-selected"><a href="image">Classify</a></li>
        </ul>
    </nav>
    <main id="classify-main">
        <div>
            <h3>Choose an image to classify</h3>
            <button class="primary-button">Choose</button>
            <img src="" alt="" id="image-viewer">
            <button class="secondary-button">Classify</button>
        </div>
        <div id="output">
            <h3>Output</h3>
            <p>Food is classified as:</p>
            <div id="output-wrapper">
                <p id="output-result"></p>
                <p id="output-api-result"></p>
            </div>
        </div>
    </main>
</body>
<script src="{{url_for('static', filename='js/app.js')}}"></script>
</html>
```

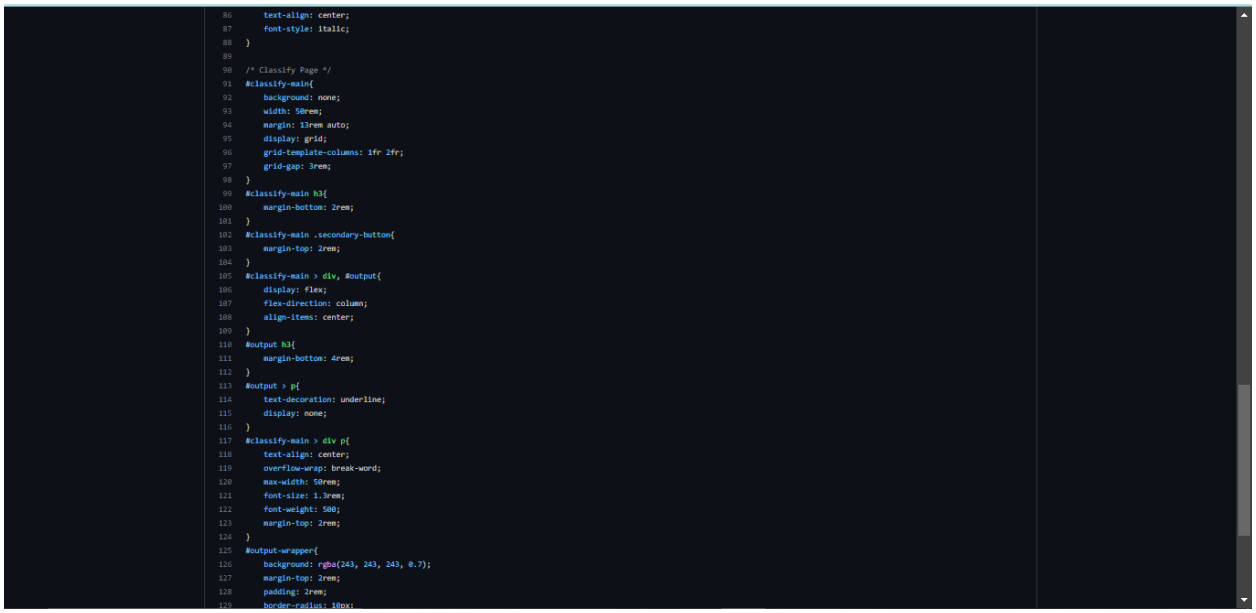


```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>AI based analyzer for Fitness Enthusiasts </title>
    <link rel="stylesheet" href="{{url_for('static', filename='css/index.css')}}">
</head>
<body>
    <nav>
        <h2> <span>Nutrition</span> Image Analysis</h2>
        <ul>
            <li class="page-selected"><a href="/">Home</a></li>
            <li><a href="image">Classify</a></li>
        </ul>
    </nav>
    <main id="home-main">
        <p>
            Food is essential for human life and has been the concern of many heathcare conventions. Nowadays new dietary assessment and
            nutrition analysis tools enable more opportunitites to help people understand their daily eating habits, exploring nutrition
            patterns and maintain a healthy diet. Nutritional analysis is the process of determining the nutritional content of food. It is
            a vital part of analytical chemistry that provides information about the chemical composition, processing, quality control and
            contamination of food. It ensures compliance with trade and food laws.
        </p>
    </main>
</body>
</html>
```

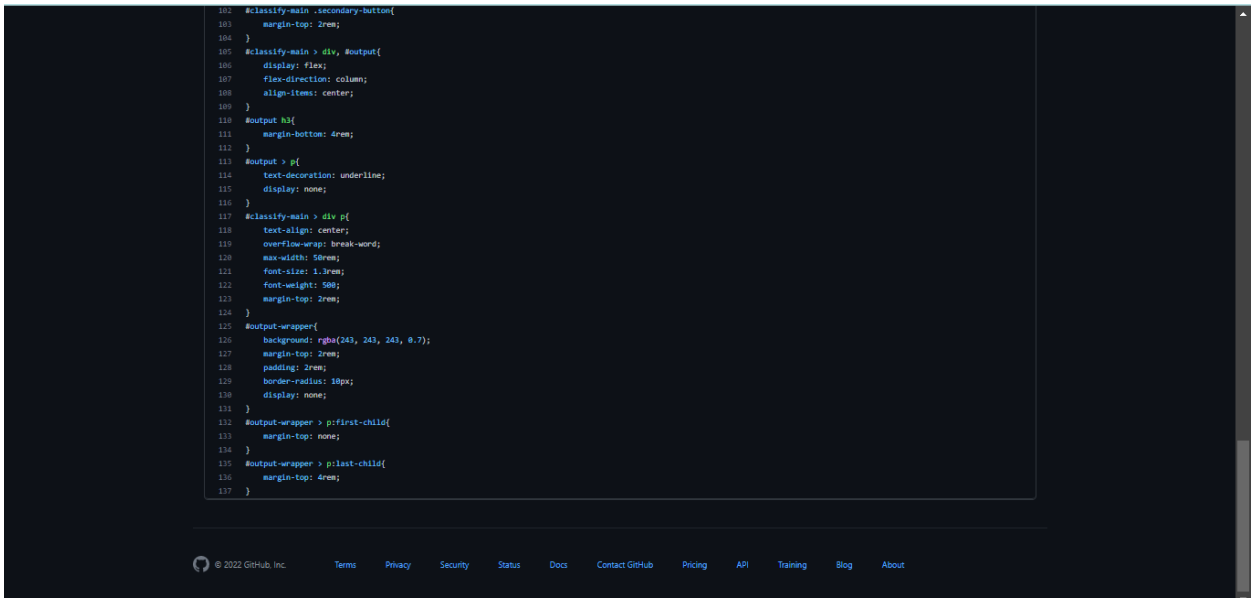
CSS

```css
*{
    box-sizing: border-box;
    margin: 0;
    padding: 0;
}
:root{
    --primary-color: lightgreen;
    --primary-color-opacity: rgba(144, 238, 144, 0.8);
}
body{
    background: url("../images/fruits.jpg") no-repeat center top/cover;
    font-family:'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
}
ul{
    list-style: none;
}
a{
    text-decoration: none;
}

/* Classes */
.page-selected{
    background: var(--primary-color);
    color: white;
}
.page-selected a{
    color: white;
}
.primary-button, .secondary-button{
    padding: 0.8rem;
    font-size: 1.2rem;
    border: none;
    color: white;
    font-weight: 500;
    border-radius: 5px;
}
.primary-button{
    background: var(--primary-color);
}
.secondary-button{
    background: rgb(50, 50, 208);
}
.primary-button:hover, .secondary-button:hover{
```

```javascript
const   chooseButton = document.querySelector('button.primary-button'),
        classifyButton = document.querySelector('button.secondary-button');
let     userFile;

chooseButton.addEventListener('click', (e)=>{
    const input = document.createElement('input');
    input.setAttribute('type', 'file');
    input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
    input.setAttribute('name', 'file');
    input.click();
    input.onchange = function(){
        const imageViewer = document.querySelector('#image-viewer');
        const reader = new FileReader();
        reader.onload = function(event){
            imageViewer.src = event.target.result;
            imageViewer.style.marginTop = '2rem';
            imageViewer.style.height = '300px';
            imageViewer.style.width = '300px';
        }
        reader.readAsDataURL(input.files[0]);
        userFile = input.files[0];
    }
})

classifyButton.addEventListener('click', (e)=> {
    const formData = new FormData();
    formData.append('file', userFile);
    fetch('/predict', {
        method: 'POST',
        body: formData
    })
    .then((response)=> response.json())
    .then((res)=> {
        const   result = document.querySelector('#output-result'),
                apiResult = document.querySelector('#output-api-result'),
                outputWrapper = document.querySelector('#output-wrapper'),
                p = document.querySelector('#output > p');

        console.log(outputWrapper)
        console.log(res.apiResult[0])

        result.innerText = res.result;
        apiResult.innerHTML = `${JSON.stringify(res.apiResult)}`;
        p.style.display = 'block';
        outputWrapper.style.display = 'block';
    })
})
```

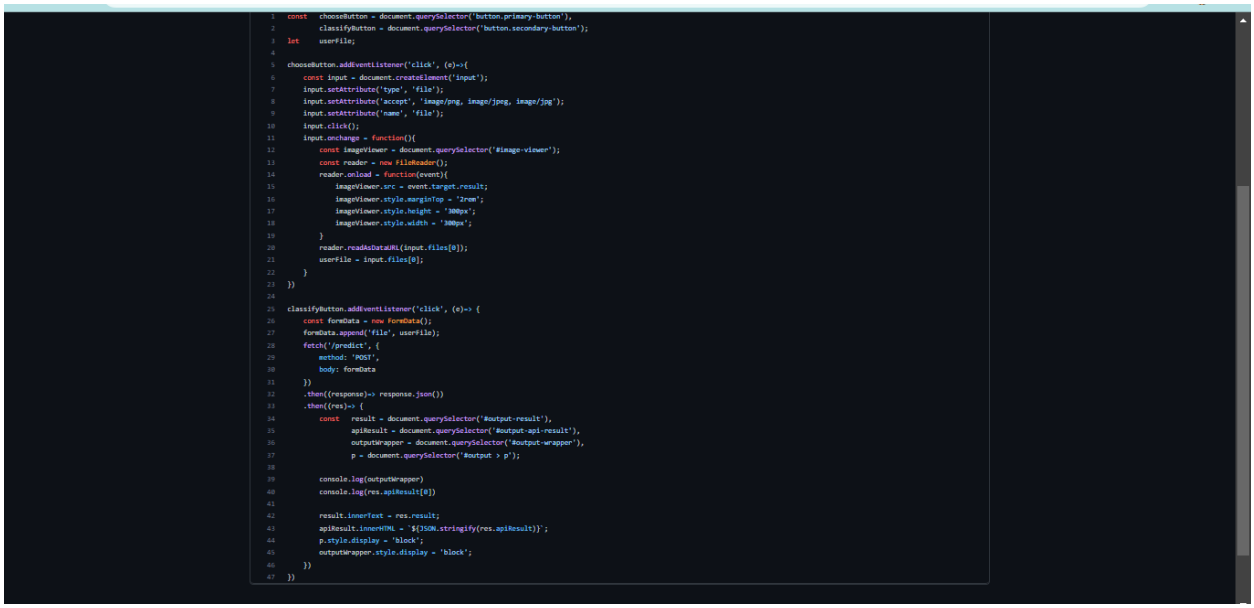


```
    text-align: center;
    font-style: italic;
}

/* Classify Page */
#classify-main{
    background: none;
    width: 50rem;
    margin: 13rem auto;
    display: grid;
    grid-template-columns: 1fr 2fr;
    grid-gap: 3rem;
}
#classify-main h3{
    margin-bottom: 2rem;
}
#classify-main .secondary-button{
    margin-top: 2rem;
}
#classify-main > div, #output{
    display: flex;
    flex-direction: column;
    align-items: center;
}
#output h3{
    margin-bottom: 4rem;
}
#output > p{
    text-decoration: underline;
    display: none;
}
#classify-main > div p{
    text-align: center;
    overflow-wrap: break-word;
    max-width: 50rem;
    font-size: 1.3rem;
    font-weight: 500;
    margin-top: 2rem;
}
#output-wrapper{
    background: rgba(243, 243, 243, 0.7);
    margin-top: 2rem;
    padding: 2rem;
    border-radius: 10px;
```



```
#classify-main .secondary-button{
    margin-top: 2rem;
}
#classify-main > div, #output{
    display: flex;
    flex-direction: column;
    align-items: center;
}
#output h3{
    margin-bottom: 4rem;
}
#output > p{
    text-decoration: underline;
    display: none;
}
#classify-main > div p{
    text-align: center;
    overflow-wrap: break-word;
    max-width: 50rem;
    font-size: 1.3rem;
    font-weight: 500;
    margin-top: 2rem;
}
#output-wrapper{
    background: rgba(243, 243, 243, 0.7);
    margin-top: 2rem;
    padding: 2rem;
    border-radius: 10px;
    display: none;
}
#output-wrapper > p:first-child{
    margin-top: none;
}
#output-wrapper > p:last-child{
    margin-top: 4rem;
}
```

APP.PY



```
const   chooseButton = document.querySelector('button.primary-button'),
        classifyButton = document.querySelector('button.secondary-button');
let     userFile;

chooseButton.addEventListener('click', (e)=>{
    const input = document.createElement('input');
    input.setAttribute('type', 'file');
    input.setAttribute('accept', 'image/png, image/jpeg, image/jpg');
    input.setAttribute('name', 'file');
    input.click();
    input.onchange = function(){
        const imageViewer = document.querySelector('#image-viewer');
        const reader = new FileReader();
        reader.onload = function(event){
            imageViewer.src = event.target.result;
            imageViewer.style.marginTop = '2rem';
            imageViewer.style.height = '300px';
            imageViewer.style.width = '300px';
        }
        reader.readAsDataURL(input.files[0]);
        userFile = input.files[0];
    }
})

classifyButton.addEventListener('click', (e)=> {
    const formData = new FormData();
    formData.append('file', userFile);
    fetch('/predict', {
        method: 'POST',
        body: formData
    })
    .then((response)=> response.json())
    .then((res)=> {
        const   result = document.querySelector('#output-result'),
                apiResult = document.querySelector('#output-api-result'),
                outputWrapper = document.querySelector('#output-wrapper'),
                p = document.querySelector('#output > p');

        console.log(outputWrapper)
        console.log(res.apiResult[0])

        result.innerText = res.result;
        apiResult.innerHTML = `${JSON.stringify(res.apiResult)}`;
        p.style.display = 'block';
        outputWrapper.style.display = 'block';
    })
})
```

GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-44388-1660724403

PROJECT DEMO LINK :

https://youtu.be/axu-Errs23c