

1. INTRODUCTION

1.1 Project Overview

The Project is aim to create an application for the hikers rare species of birds, flowers, mammals by giving a picture taken by them.

Naturalist is someone who studies the patterns of nature, identifies a different kind of flora and fauna in nature. Being able to identify the flora and fauna around us often leads to an interest in protecting wild spaces, and collecting and sharing information about the species we see on our travels is very useful for conservation groups like NCC.

When venturing into the woods, field naturalists usually rely on common approaches like always carrying a guidebook around everywhere or seeking help from experienced ornithologists. There should be a handy tool for them to capture, identify and share the beauty to the outside world.

Field naturalists can only use this web app from anywhere to identify the birds, flowers, mammals and other species they see on their hikes, canoe trips and other excursions.

In this project, we are creating a web application which uses a deep learning model, trained on different species of birds, flowers and mammals (2 subclasses in each for a quick understanding)and get the prediction of the bird when an image is been given.

Recent reports of global biodiversity decline make it more important than ever to monitor biodiversity so that we can detect changes and infer their drivers. Online digital media, such as social media images, may be a new source of biodiversity observations, but they are far too numerous for a human to practically review. In this paper we apply an AI image classifier, designed to identify plants from images, to social media imagery to assess this method as a way to generate new biodiversity observations. We find that this approach is able to generate new data on species occurrence but that there are biases in both the social media data and the AI image classifier that need to be considered in analyses. This approach could be applied outside the biodiversity domain, to any phenomena of interest that may be captured in social media imagery. The checklist we provide at the end of this paper should therefore be of interest to anyone considering this approach to generating newdata.

1.2 Purpose

- **AI image classifiers can create biodiversity datasets from social media imagery.**
- **Flickr hosts many images of plants; some can be accurately classified to species by AI.**
- **Images are spatially aggregated around tourist sites and under native species.**
- **focused on a single, non-horticultural, plant are most reliably identified.**
- **AI holds great promise for improving the conservation and sustainable use of biodiversity and ecosystem services in a rapidly changing and resource-limited world. For example, scientists are already testing machine learning, a form of AI, to predict which plants are threatened with extinction.**

2. LITERATURE SURVEY

2.1 Existing problem

- ❖ We don't see that different societies respond to these 'objective truths' in the same way. For example, sacrifice and the pain it brings are observable as abhorrent in our society, but as a point of worship in another society, but may be seen
- ❖ The Is-Ought problem would challenge that science can be used to give moral values.
- ❖ We cannot move as readily from fact to value as we do - Hume believes that we skip a step. For example, we have evolved by reproduction between a man and a woman, therefore homosexuality is wrong because it doesn't further this.
- ❖ Hume argues that unless the 'jump' is explained, the argument falls short.
- ❖ The Naturalistic Fallacy believes that defining good is a mistake. It is a simple notion, like yellow, and cannot be explained to someone who doesn't already know it. It is 'sui generis', of its own kind.
- ❖ This is convincing as it rests on the understanding that goodness can be a multitude of things, which we know to be true, from our experience.

- ❖ If we could define one thing as good, such as pleasure, 'is pleasure good?' would be a contradictory question as it would be like asking 'is good good?' however, this is not the case.

- ❖ The NF also is supported by the open-question argument. This states that if we define something as good, we should have a closed question. For example, 'is a mug used to drink liquids?' we answer with yes.
- ❖ However, we cannot respond to the question 'is pleasure good?' with a closed answer because it is multifaceted. Moore argues that it isn't reducible to one idea.

2.2 References

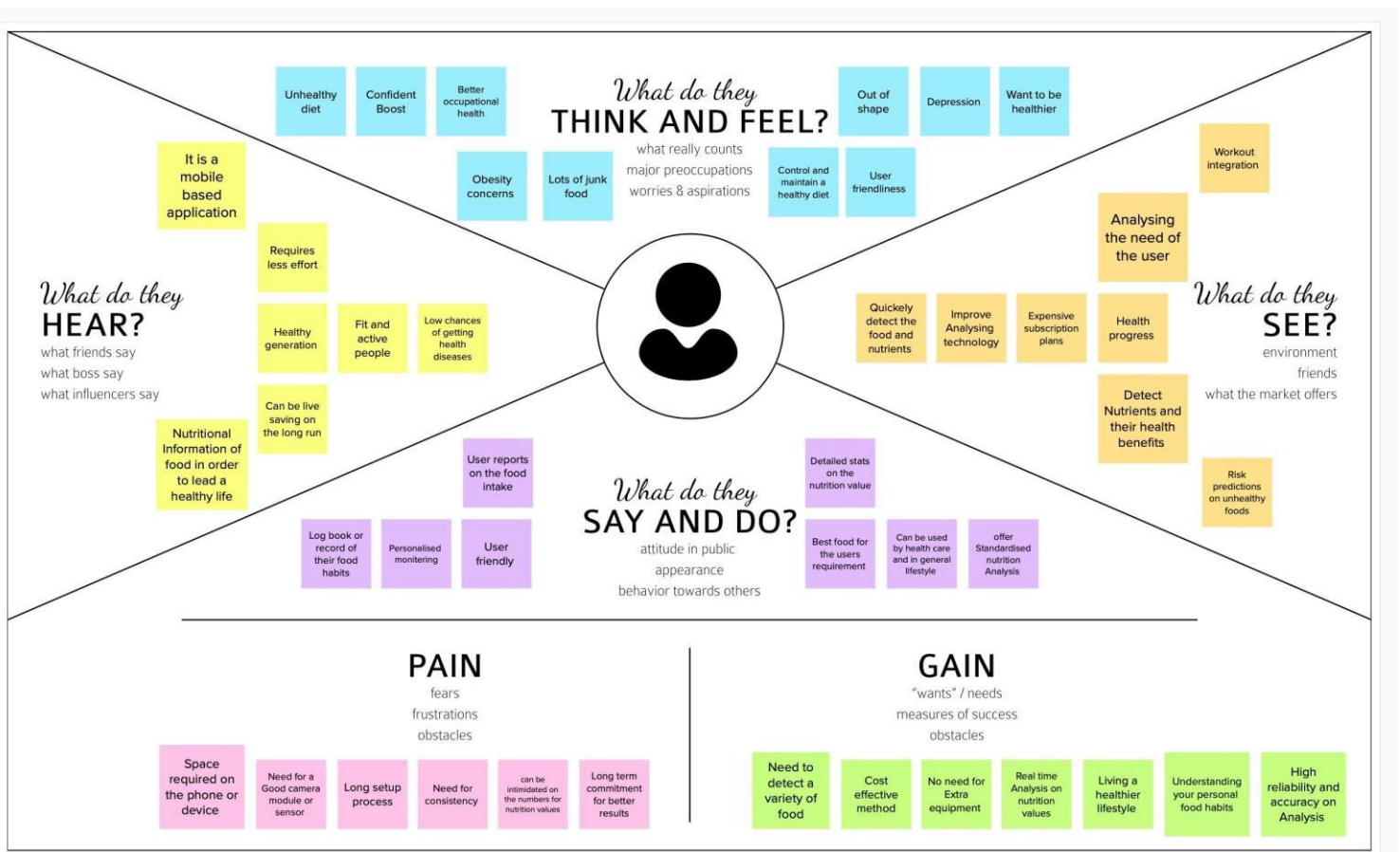
- AI Naturalist might should hold the key to unlocking Biodiversity Data in Social Media Imaginary [Tom A. August, Oliver L. Pescott, Alexsis Jolly, 2022]
- An Overview of Remote Monitoring Methods in Biodiversity Conservation [Rout George Kerry, Rajeswari Das, Sushmitra Patra 2021]
- Ecology, Harnessing Large Online Resources To Generate Ecological Generates [Ivan Jaric, Jessie C. Butuel, Richard Ladle 2020]
- Future Challenges For Engagement Data Collection and Data Quality [Marya Loffain, Jens Iegensand, 2021]
- Digitilization to Achieve Sustainable Development Goals [Marcia E. Mondejar, Sergi Garcia Segura 2020]

2.3 Problem Statement Definition

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.).

3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation and Brainstorming

[illegible]

3.3 Proposed Solution

Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<p>i) How might we help both experienced and inexperienced user to identify species of plants and animals and their characteristics with related information?</p> <p>ii) Inexperienced users need to know about poisonous plants and dangerous animals so that they can stay away from it.</p> <p>iii) Both experienced and inexperienced users need to know about the medicinal values of a plant because they need to use it in case of emergencies.</p> <p>iv) All the users need to know about the rarity of the species of birds, animals or plants so that they can preserve and save it.</p>
2.	Idea / Solution description	<p>i) Display Botanical names</p> <p>ii) Display alert messages for plants/animals using different colours</p> <p>iii) small description about them</p> <p>iv) Rarities of the species</p> <p>v) What disease does the plant cure</p>
3.	Novelty / Uniqueness	<p>i) Providing alerts based on if a species is harmful or not</p> <p>ii) Alerting the user on the rarity of the species</p> <p>iii) Gives the complete description about the species being viewed</p> <p>iv) If the plant being viewed has a medicinal value , it gives a description about it.</p> <p>v) Display the scientific name of the species.</p>
4.	Social Impact / Customer Satisfaction	Being able to identify the flora and fauna around us often leads to an interest in protecting wild spaces.
5.	Business Model (Revenue Model)	<p>i) Can make money through subscription based.</p> <p>ii) Partnership with many laboratories and scientists around the world</p>
6.	Scalability of the Solution	<p>i) As the usage and user base of this application grows more feature can be added to the premium or subscription model.</p> <p>ii) We can introduce subscription models like free plan, business plan, educational plan and many more based on its usage</p> <p>iii) As the usage increase we can scale the application by releasing more languages based on the geographical usage.</p>

3.4 Problem Solution fit

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns

Purpose:

- Solve complex problems in a way that fits the state of your customers.
- Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- Sharpen your communication and marketing strategy with the right triggers and messaging.
- Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.

Project Title: Digital Naturalist

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID30984

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <ul style="list-style-type: none">• Ornithologist• Students• Hikers• Migrators• Biologist• Zoologist• Tourister• Research people	6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none">• Network issues• Insufficient knowledge about the biodiversity.• Cannot remember all the basic life saving tips• Making observations among species.	5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none">• Need to always carry a guidebook around everywhere• Internet databases where we must search for certain species from the mountain of images from the web using modern algorithms.• Usage of ai to tackle different complex difficulties in the wildlife.	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none">• Unable to identify sub species of certain amphibians or birds.• Cannot find a suitable place to work in the workplace• Cannot find the exact habitat of certain species.	9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none">• complexities in identification• Information gathering• Need to depend on external resources• Large dataset• Money problem• Depend upon Guide	7. BEHAVIOUR BE <ul style="list-style-type: none">• Volunteering for jobs where we can actively work with wildlife<ul style="list-style-type: none">◦• Finding rare and endangered species of flora and fauna and help them navigate in current	

Identify strong TR & EM	3. TRIGGERS <ul style="list-style-type: none"> Save nature Save Endangered Species Expanding the lifespan of certain species through medicine Helps to gather aerial species away from places where they are prone to tower kill or other dangers 	10. YOUR SOLUTION <ul style="list-style-type: none"> It can be in offline mode All information about the Species should be displayed. Medical Benefits of different plants can be displayed. Display alert messages for plants/animals Display alert messages for plants and animals. 	8.CHANNELS of BEHAVIOUR <div> 8.1 ONLINE <ul style="list-style-type: none"> Capture image and search it Browse using the internet </div> <div> 8.2 OFFLINE <ul style="list-style-type: none"> Hand notes Getting the information from experienced user </div>	Identify strong TR & EM

4. EMOTIONS: BEFORE / AFTER <ul style="list-style-type: none"> Co2 to o2 Imbalanced world to sustainable world Accumulation of waste to renewable energy 		
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4. REQUIREMENT ANALYSIS

4.1 Functional requirement

- The task of detection/classification is not easy as it seems. All possible options related to the given Image.
- Image classification, object detection, segmentation, face recognition.
- Classification of crystal structure using a convolutional neural network
- 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 aids 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

Computer-Assisted Nutritional 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.

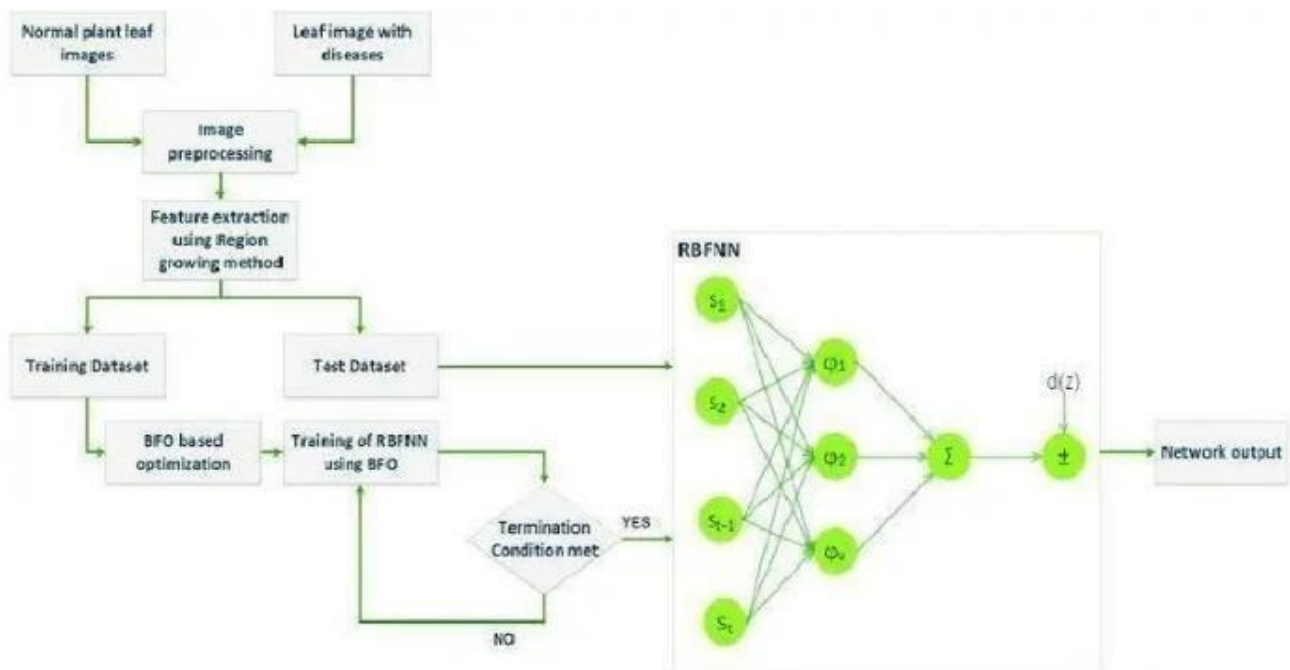
- Here the user can capture the images of different fruits and then the image will be sent to the trained model. The model analyzes the image and detects the nutrition based on the fruits like (Animal, Bird, Flower, etc.)
- The Ultimate Workout at Home Solution This fitness AI software is designed with personalized training regimens for each individual. It began as “gym only software,” but has now improved its system to satisfy “at home fitness” expectations.
- 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.
- This software collaborated with IBM’s natural language capability to provide 24-hour assistance and dietary recommendations.

4.2 Non Technical Requirement

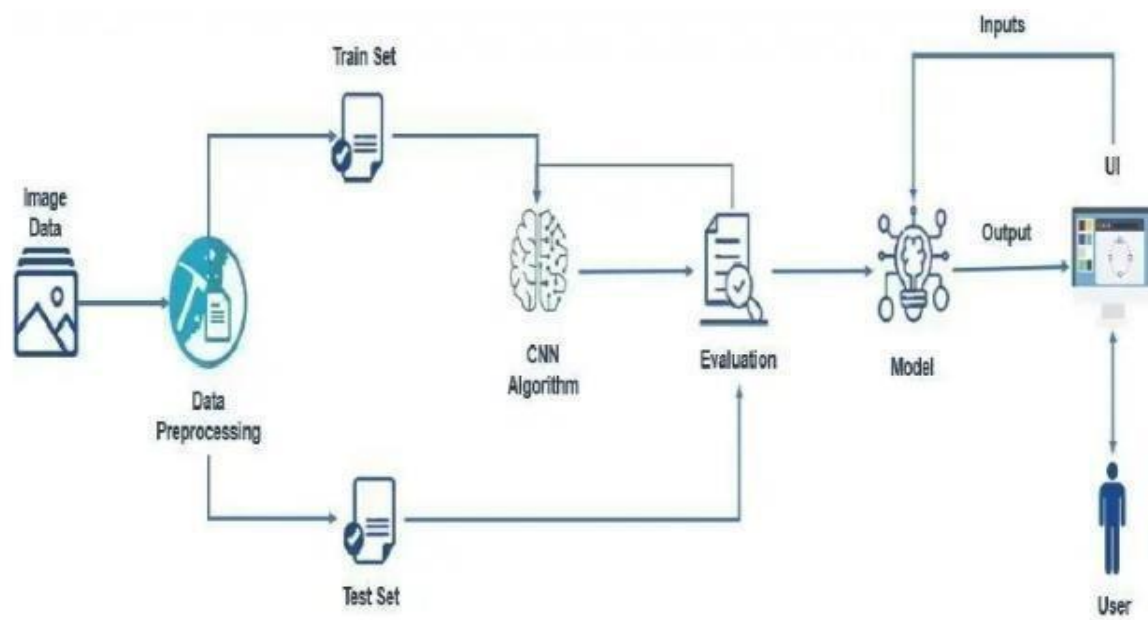
- The comparison of the proposed model with the conventional models shows that the results of this model are exceptionally good and promising to use in real-world applications.
- This sort of higher accuracy and precision will work to boost the machine's general efficiency in fruit recognition more appropriately.
- A generic model for the dietary protein requirement (as with any nutrient) defines the requirement in terms of the needs of the organism,
- i.e. metabolic demands, and the dietary amount which will satisfy those needs, i.e. efficiency of utilization, thus: dietary requirement = metabolic demand/efficiency of utilization.

5. PROJECT DESIGN 5.1 Data Flow Diagrams

WORK FLOW DIAGRAM:



5.2 Solution & Technical Architecture



6. Project Planning & Scheduling

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Modelling Phase	USN-1	Data Collecting and digitalizing for analysing	3	Medium	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-2	Adding more data to avoid overfitting	2	Medium	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-3	Building a CNN model using the collected data	5	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-4	Evaluating the model to check the accuracy and precision	3	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-2	Development Phase	USN-5	Home page Creation – Shows the features of our application	1	Low	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI

						M. KANNAN
Sprint-2		USN-6	Setting up facilities for user to feed the image	2	Medium	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-2		USN-7	Prediction page creation – shows prediction for the user given image	4	Medium	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-2		USN-8	Model loading – API creation using flask	5	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-3	Deployment Phase	USN-9	Integrating UI & backend – Connecting the front end and backend using API calls	3	Medium	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-3		USN-10	Cloud deployment – Deployment of application using IBM Cloud	5	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-4	Testing Phase	USN-11	Functional testing – Checking the scalability and robustness of the application	5	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-4		USN-12	Non-Functional testing – Checking for user acceptance and integration	5	High	J. KESHAHA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Total Story Points	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	4 Days	24 Oct 2022	27 Oct 2022	20	29 Oct 2022
Sprint-2	20	5 Days	28 Oct 2022	01 Nov 2022	20	04 Nov 2022
Sprint-3	20	8 Days	02 Nov 2022	09 Nov 2022	20	11 Nov 2022
Sprint-4	20	9 Days	10 Nov 2022	18 Nov 2022	20	19 Nov 2022

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

Loading images into machine understandable data

```
[ ] X_data = []
    Y_data = []

    id_no = 0
    found = []
    for paths in subfolders:
        drive = glob.glob ('/content/drive/MyDrive/1bm/Augmentation data/*.jpg')
        found.append((paths.split('///')[-1], paths.split('///')[-1]))

        for MyDrive in drive:
            img = Image.open (MyDrive)
            img =img.resize(( 150, 150), Image.ANTIALIAS)
            img = np.array(img)
            if img.shape == ( 150, 150, 3):
                X_data.append (img)
                Y_data.append (id_no)
            id_no+= 1
```

Data Splitting into Train and Test

```
[ ] train_datagen = ImageDataGenerator(rescale=1./255, shear_range = 0.2, zoom_range=0.2 ,horizontal_flip= True, vertical_flip=True)

[ ] test_datagen = ImageDataGenerator(rescale=1./255)

[ ] X_train = train_datagen.flow_from_directory(r"/content/Digital Naturalist Dataset",target_size=(64,64), batch_size=32, class_mode="categorical")

Found 138 images belonging to 3 classes.

[ ] X_test = test_datagen.flow_from_directory(r"/content/Digital Naturalist Dataset",target_size=(64,64), batch_size=32, class_mode="categorical")

Found 138 images belonging to 3 classes.

[ ] X_train.class_indices

{'Bird': 0, 'Flower': 1, 'Mammal': 2}
```

layers

```
[ ] model = Sequential()

[ ] from keras.layers.convolutional.conv2d import Convolution2D
    model.add(Convolution2D(32,(3,3), activation="relu", input_shape=(64,64,3)))

[ ] from keras.layers.pooling.max_pooling2d import MaxPooling2D
    model.add(MaxPooling2D(pool_size=(2,2)))

[ ] model.add(Flatten())

[ ] model.add(Dense(units=300,kernel_initializer="random_uniform",activation="relu"))

[ ] model.add(Dense(units=200,kernel_initializer="random_uniform",activation="relu"))

[ ] model.add(Dense(units=3,kernel_initializer="random_uniform",activation="softmax"))
```

7.1 Feature 1

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

Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).

```
!unzip "/content/drive/MyDrive/ibm/Digital Naturalist Dataset.zip"
```

inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (4).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (5).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (6).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (7).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (8).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download (9).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/download.jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (1).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (10).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (11).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (12).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (2).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (3).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (4).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (5).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (6).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (7).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (8).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images (9).jpg
inflating: Digital Naturalist Dataset/Flower/Lady Slipper Orchid Flower/images.jpg
creating: Digital Naturalist Dataset/Mammal/
creating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (1).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (2).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (3).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (4).jpg
extracting: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (5).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (6).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download (8).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/download.jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/images (1).jpg
inflating: Digital Naturalist Dataset/Mammal/Pangolin Mammal/images (10).jpg

```
[ ] X.shape
(64, 64, 3)

[ ] import numpy as np

[ ] #convolution expects
X = np.expand_dims(X,axis=0)

[ ] X.shape
(1, 64, 64, 3)

[ ] pred_prob = model.predict(X)
1/1 [=====] - 0s 315ms/step

[ ] pred_prob
array([[0., 1., 0.]], dtype=float32)

[ ] class_name=["Bird","Flower","Mammal"]
pred_id = pred_prob.argmax(axis=1)[0]

[ ] pred_id
1

[ ] print("the predicted dataset is",str(class_name[pred_id]))
the predicted dataset is Flower
```

```
[ ] model.save("Digital Naturalist Dataset.h5")
```

bold text

```
[ ] from tensorflow.keras.models import load_model
from tensorflow.keras.preprocessing import image
```

```
[ ] model =load_model("Digital Naturalist Dataset.h5")
```

```
[ ] img = image.load_img("/content/Digital Naturalist Dataset/Flower/Corpse Flower/download (1).jpg",target_size=(64,64))
```

```
[ ] img
```



```
[ ] type(img)
```

```
PIL.Image.Image
```

```
[ ] X = image.img_to_array(img)
```

```
[ ] X
```

```
array([[[[159., 157., 207.],
[185., 187., 236.],
[146., 151., 193.],
...,
[ 34., 44., 45.],
[100., 105., 125.],
[102., 106., 131.]],

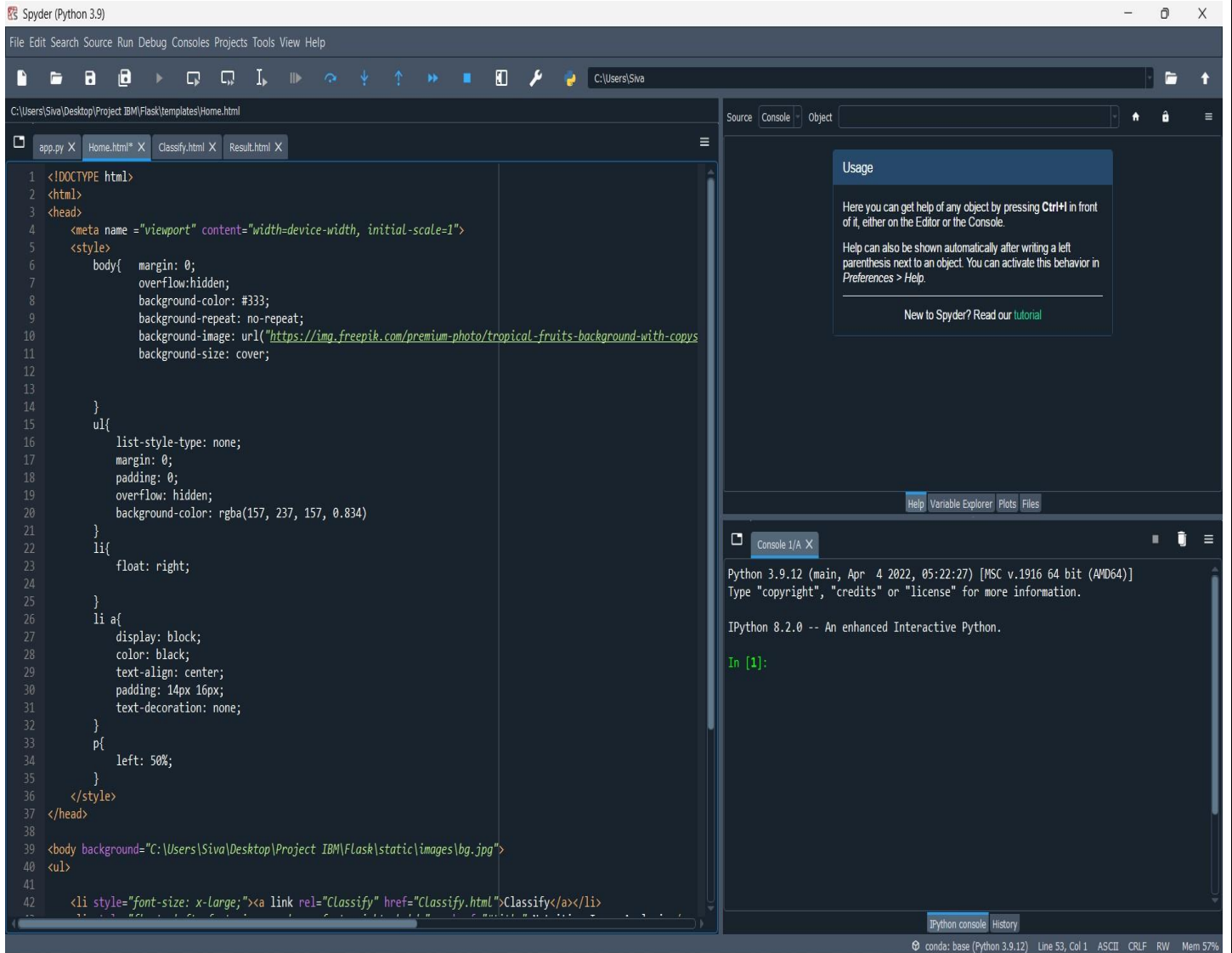
[[185., 174., 216.],
[170., 163., 204.],
[113., 109., 146.],
...,
[ 52., 60., 71.],
[ 11., 26., 19.],
[ 39., 53., 54.]],

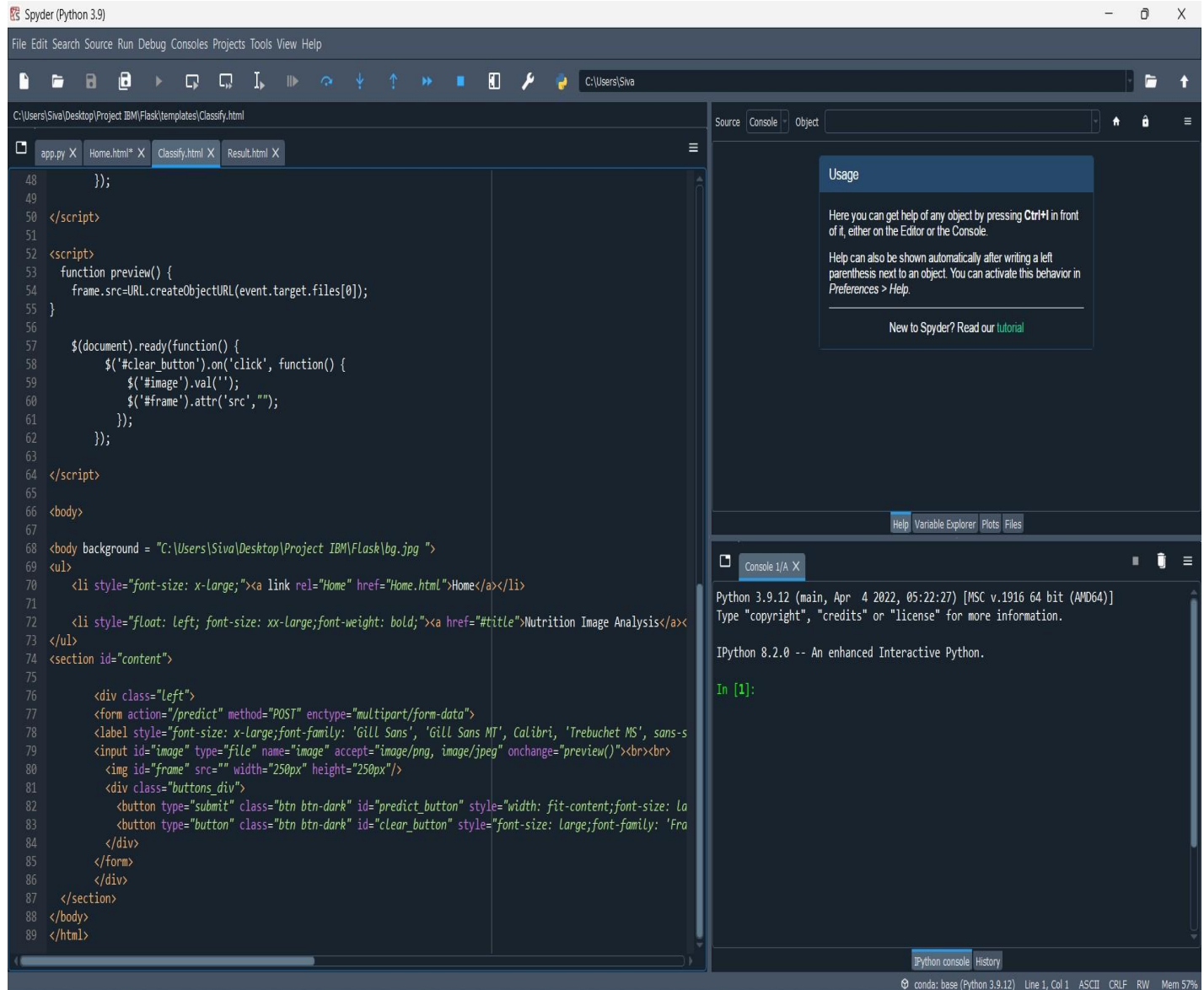
[[170., 158., 194.],
[157., 149., 186.],
[123., 117., 153.],
...,
[ 53., 65., 51.],
[ 86., 96., 105.],
[ 79., 88., 103.]]],

[[[ 1.,  0.,  0.],
[ 0.,  1.,  0.],
[ 0.,  0.,  1.],
...,
[ 0.,  0.,  0.],
[ 0.,  0.,  0.],
[ 0.,  0.,  0.]]],

[[[ 0.,  0.,  0.],
[ 0.,  0.,  0.],
[ 0.,  0.,  0.],
...,
[ 0.,  0.,  0.],
[ 0.,  0.,  0.],
[ 0.,  0.,  0.]]]])
```


Feature 2





Spyder (Python 3.9)

File Edit Search Source Run Debug Consoles Projects Tools View Help

C:\Users\Siva

C:\Users\Siva\Desktop\Project IBM\Fask\templates\Result.html

app.py X Home.html* X Classify.html X Result.html X

```
1 <html lang="en" dir="ltr">
2 <head>
3 <style>
4   body{
5     background-image: url('https://img.freepik.com/premium-photo/tropical-fruits-background-with-copyspace-left
6     background-size: cover;
7     background-repeat: no-repeat;
8   }
9
10 </style>
11 <meta charset="utf-8">
12 <title>Nutrition Image Analysis</title>
13 <link rel="shortcut icon" href="{{ url_for('static', filename='diabetes-favicon.ico') }}">
14 <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='style.css') }}">
15 <script src="https://kit.fontawesome.com/5f3f547070.js" crossorigin="anonymous"></script>
16 <link href="https://fonts.googleapis.com/css2?family=Pacifico&display=swap" rel="stylesheet">
17 </head>
18
19 <!-- Result -->
20 <div class="results">
21   <p style="padding-top: 150px; color:blue;text-align: center;">
22     <h1 style="color:blue;font-size:xx-large;text-align: center;font-family: 'Segoe UI', Tahoma, Ger
23     <b><h2 style="color:red;text-align: center;font-size: xx-large;font-family: 'Franklin Gothic
24     <br><h3 style="color:black;text-align: center;width: 58%;margin-left: 20%;font-size: Lar
25
26   </div>
27   <br>
28   <br>
29 </div>
30 </body>
31 </html>
```

Usage

Here you can get help of any object by pressing **Ctrl+H** in front of it, either on the Editor or the Console.

Help can also be shown automatically after writing a left parenthesis next to an object. You can activate this behavior in [Preferences > Help](#).

New to Spyder? Read our [tutorial](#)

Help Variable Explorer Plots Files

Console 1/A X

Python 3.9.12 (main, Apr 4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license()" for more information.

IPython 8.2.0 -- An enhanced Interactive Python.

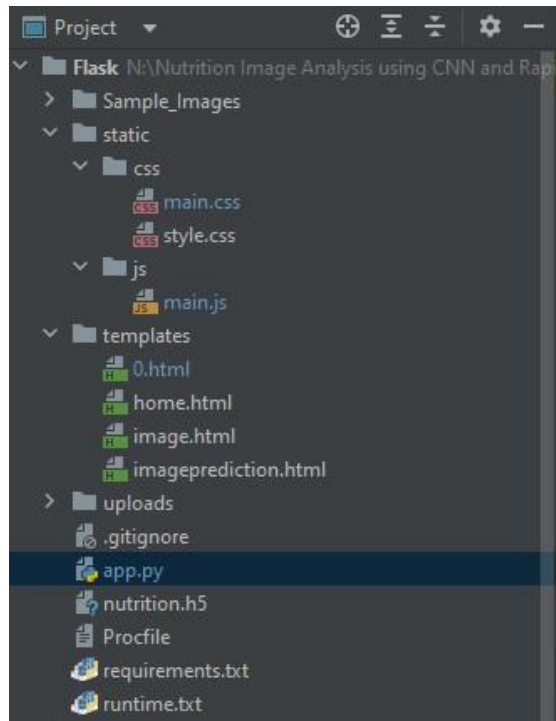
In [1]:

Python console History

conda: base (Python 3.9.12) Line 31, Col 8 ASCII CRLF RW Mem 57%

8. TESTING

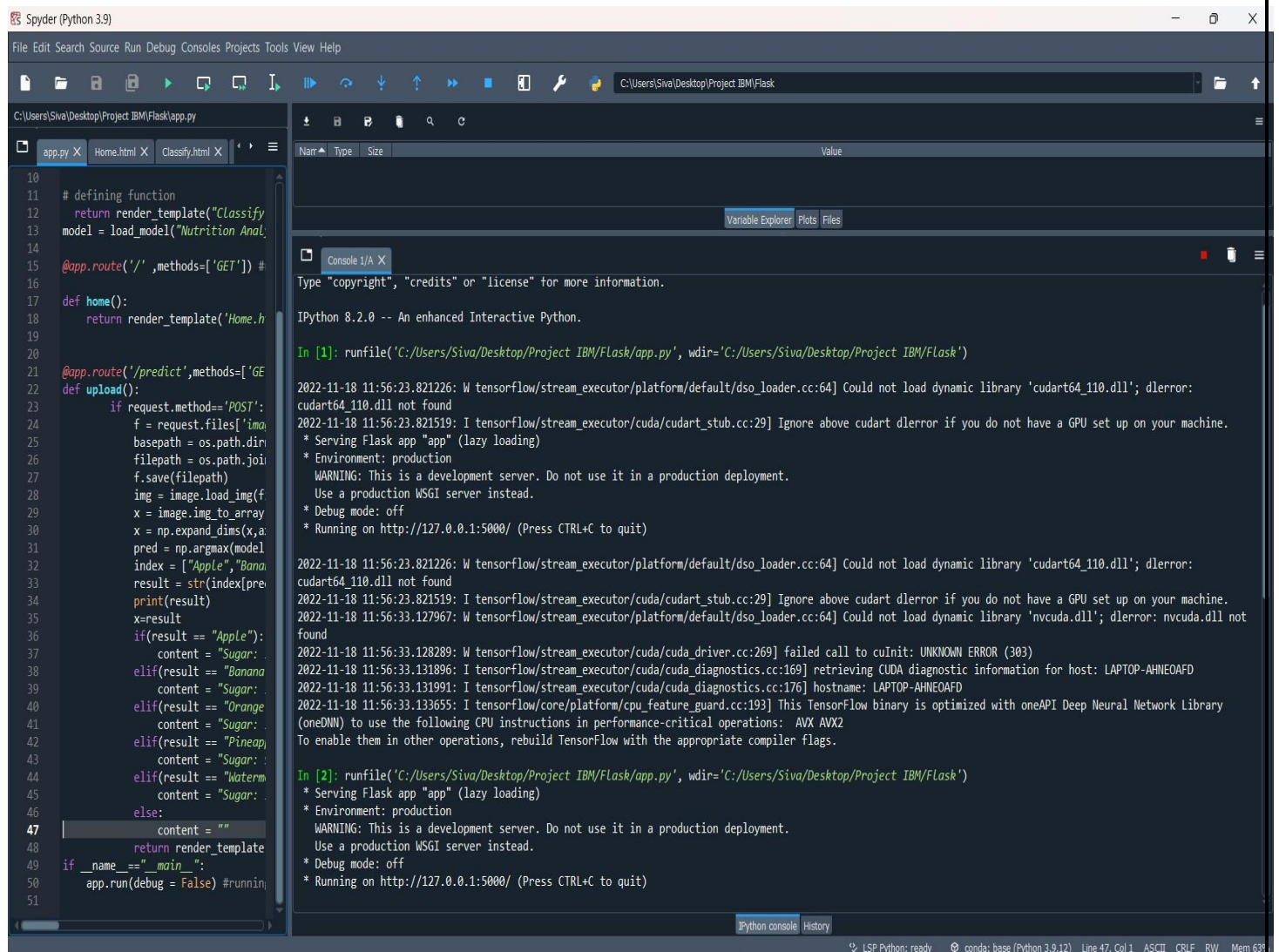
8.1 TestCases



8.2 User Acceptance Testing

9. RESULTS

9.1 Performance Metrics



The screenshot displays the Spyder Python IDE interface. The left pane shows a Python file named `app.py` with the following code:

```
10
11 # defining function
12 return render_template("Classify
13 model = load_model("Nutrition Anal
14
15 @app.route('/', methods=['GET']) #
16
17 def home():
18     return render_template('Home.h
19
20
21 @app.route('/predict', methods=['GE
22 def upload():
23     if request.method == 'POST':
24         f = request.files['ima
25         basepath = os.path.dir
26         filepath = os.path.joi
27         f.save(filepath)
28         img = image.load_img(f
29         x = image.img_to_array
30         x = np.expand_dims(x,a
31         pred = np.argmax(model
32         index = ["Apple", "Bana
33         result = str(index[pre
34         print(result)
35         x=result
36         if(result == "Apple"):
37             content = "Sugar: .
38         elif(result == "Banana
39             content = "Sugar: .
40         elif(result == "Orange
41             content = "Sugar: .
42         elif(result == "Pineap
43             content = "Sugar: .
44         elif(result == "Waterm
45             content = "Sugar: .
46         else:
47             content = ""
48         return render_template
49 if __name__ == "__main__":
50     app.run(debug = False) #runnin
51
```

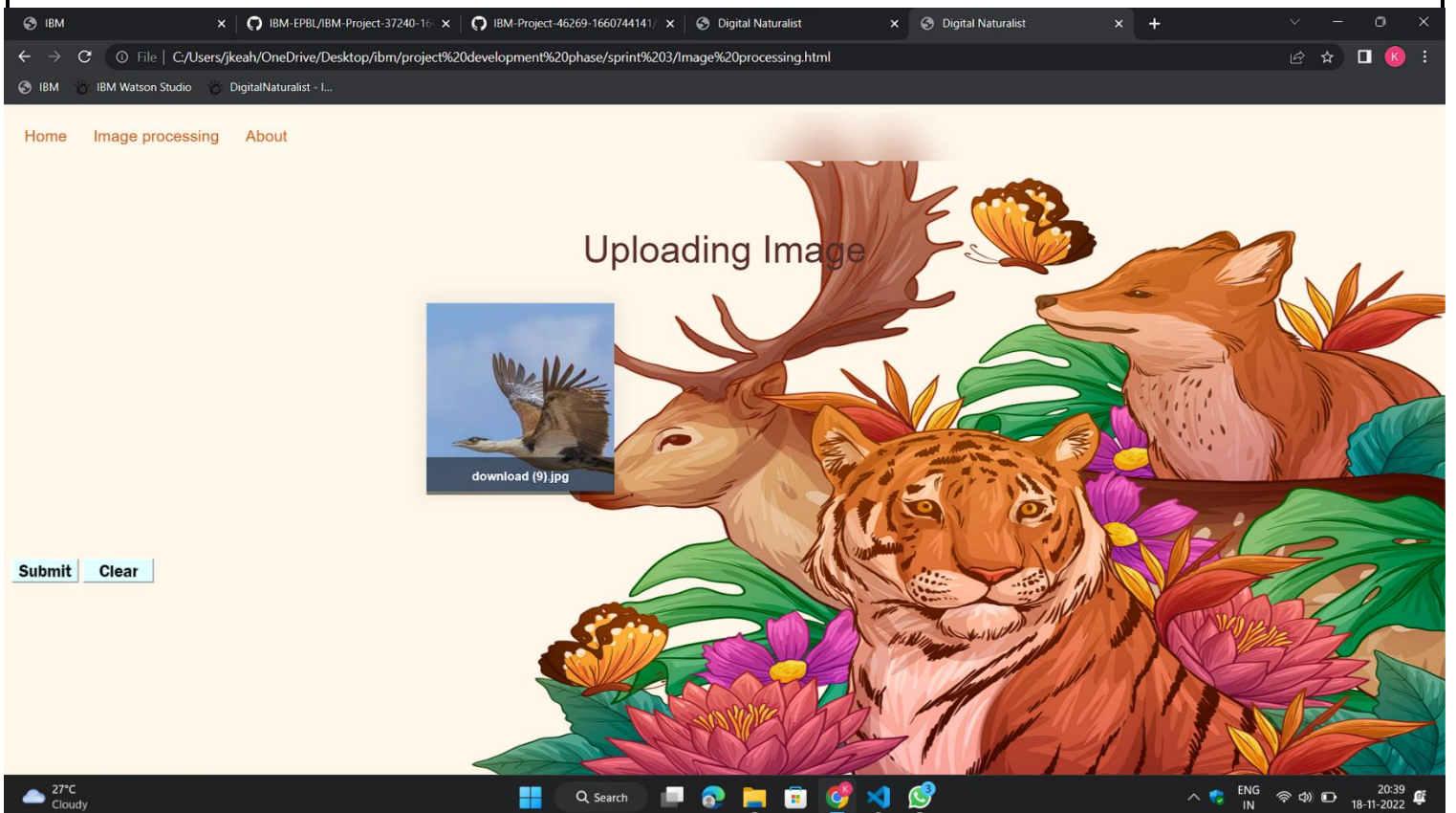
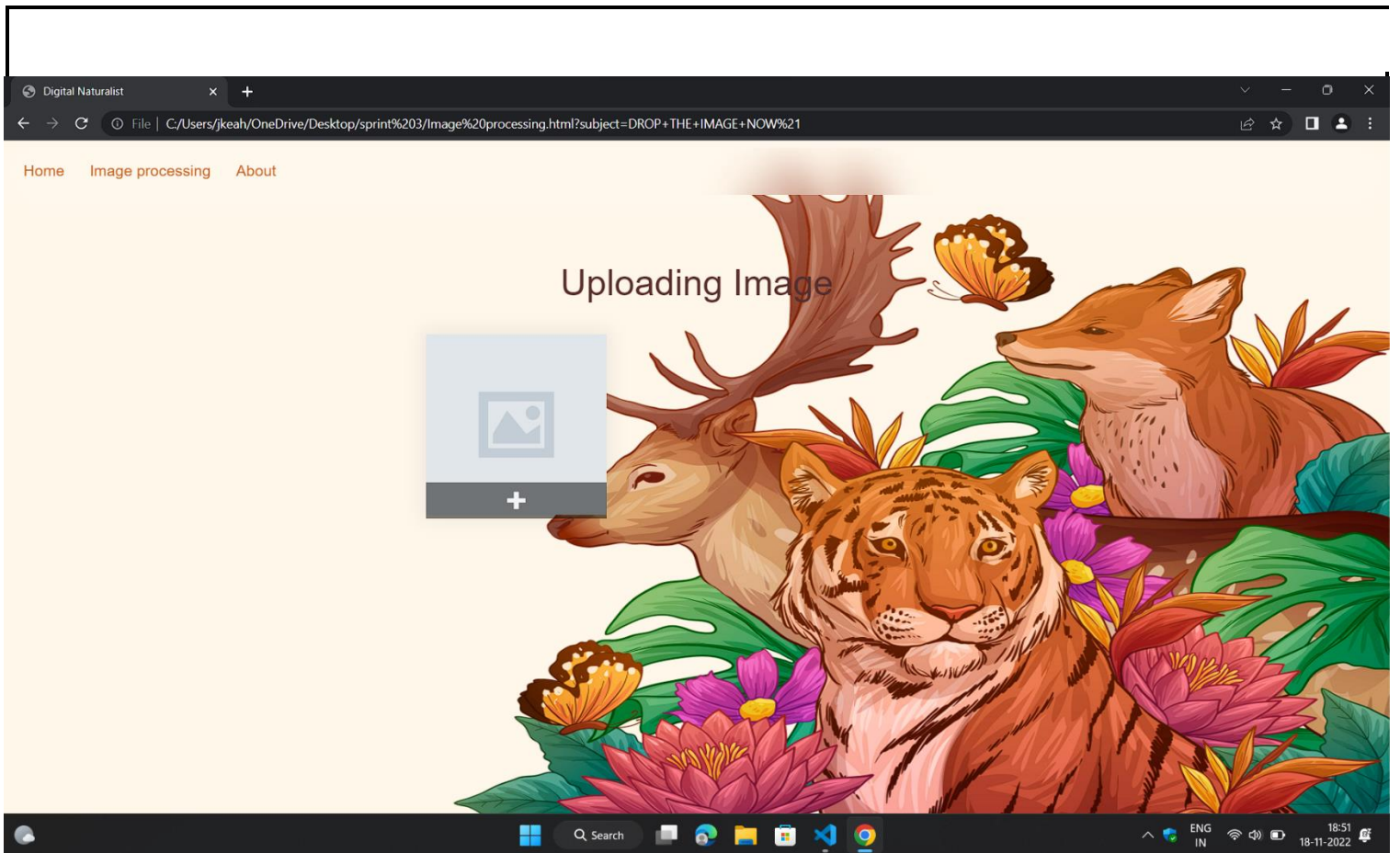
The right pane shows the IPython console output, which includes the following messages:

```
Type "copyright", "credits" or "license" for more information.
IPython 8.2.0 -- An Enhanced Interactive Python.
In [1]: runfile('C:/Users/Siva/Desktop/Project IBM/Flask/app.py', wdir='C:/Users/Siva/Desktop/Project IBM/Flask')
2022-11-18 11:56:23.821226: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'cudart64_110.dll'; dlderror:
cudart64_110.dll not found
2022-11-18 11:56:23.821519: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.
* 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: off
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
2022-11-18 11:56:23.821226: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'cudart64_110.dll'; dlderror:
cudart64_110.dll not found
2022-11-18 11:56:23.821519: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.
2022-11-18 11:56:33.127967: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'nvcuda.dll'; dlderror: nvcuda.dll not
found
2022-11-18 11:56:33.128289: W tensorflow/stream_executor/cuda/cuda_driver.cc:269] failed call to cuInit: UNKNOWN ERROR (303)
2022-11-18 11:56:33.131896: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:169] retrieving CUDA diagnostic information for host: LAPTOP-AHNEOAFD
2022-11-18 11:56:33.131991: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:176] hostname: LAPTOP-AHNEOAFD
2022-11-18 11:56:33.133655: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
(oneDNN) to use the following CPU instructions in performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
In [2]: runfile('C:/Users/Siva/Desktop/Project IBM/Flask/app.py', wdir='C:/Users/Siva/Desktop/Project IBM/Flask')
* 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: off
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

The bottom status bar indicates the current environment: LSP Python: ready, conda: base (Python 3.9.12), Line 47, Col 1, ASCII, CRLF, RW, Mem 63%.

Output





10. Advantages & Disadvantages

Advantages :

- A naturalist is someone who studies the patterns of nature, identifies a difference kind of flora and fauna in nature.
- Being a able to identify the flora and fauna around us often leads to an interest in protecting wild spaces, and collecting and sharing information about the species we see on our travels is very useful for conservation groups like NCC.
- When the venturing into the woods, field naturalist is usually rely on the common approaches for the carrying a guidebook around everywhere.

Disadvantage :

- Requires internet connection.
 - Need input data to be in the image format.
-

11. CONCLUSION

By the end of this project we will

- know fundamental concepts and techniques of Convolutional Neural Network.
- gain a broad understanding of image data
- know how to build a web application using the Flask framework.
- know how to pre-process data and
- know how to clean the data using different data preprocessing techniques.

12. FUTURE SCOPE

- AI is revolutionizing the health industry.
- It is majorly used in improving marketing and sales decisions, AI is now also being used to reshape individual habits.
- In future we don't want to go to gym and do any diets. By using this nutrition fitness analyzer we can maintain our diet plans without any help from others and we can lead a happy and healthy life with good wealth.
- AI can easily track health behaviors and repetitive exercise patterns and use the data to guide you towards your fitness journey and diet plans .

13. APPENDIX SOURCE CODE

Home page

```
<!DOCTYPE html>
<html>
  <head>  <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Digital Naturalist</title>
    <link rel="style.css" href="https://fonts.googleapis.com/css2
family=montserrat&display=swap">
    <link rel="stylesheet" href="style.css">
  </head>
  <body class="ab" background="C:\Users\jkeah\OneDrive\Desktop\static\world-wildlife-day-
illustration-paper-style\dn.jpg">
    <nav class="navbar" >
      <a href="Home.html">Home</a>
      <a href="Image processing.html">Image processing</a>
      <a href="about.html">About</a>
    </nav>
    <div>
      <p>
        Are you a nature lover or a bird watcher? There are millions of rare species in
the nature.
```

This application helps you in identifying the kind of species and gives you brief information about it.

This application uses neural networks which can identify some of the rare bird and animal species.

```
</p>
<h4><b>Exciting!! isn't it?</b></h4>
<form action="Image processing.html">
    <button name="subject" type="submit" value="DROP THE IMAGE NOW!">DROP THE IMAGE
NOW!</button>
</form>
</div>

</body>
</html>
```

Image processing

```
<!DOCTYPE html>
<html class="ip">
  <head> <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Digital Naturalist</title>
    <link rel="style.css" href="https://fonts.googleapis.com/css2
family=montserrat&display=swap">
    <link rel="stylesheet" href="image.css">
  </head>
  <body class="ac" background="C:\Users\jkeah\OneDrive\Desktop\111.jpg" >
    <nav class="navbar">
      <a href="Home.html">Home</a>
      <a href="Image processing.html">Image processing</a>
      <a href="about.html">About</a>
    </nav>
    <div class="form">
      <h2>Uploading Image </h2>
      <div class="grid">
        <div class="form-element">
          <input type="file" id="file" accept="image/*">
          <label for="file" id="file-preview">
            
            <div>
              <span>+</span>
            </div>
          </label>
        </div>
      </div>
    </div>
    <div class="result">
```

```
        <button type="submit" class="btn btn-dark" id="predict_button" style="width: fit-
content;font-size: large;font-family: 'Franklin Gothic Medium', 'Arial Narrow', Arial, sans-
serif;background-color: lightcyan;border-color: white;" >Submit</button>
        <button type="button" class="btn btn-dark" id="clear_button" style="font-size:
large;font-family: 'Franklin Gothic Medium', 'Arial Narrow', Arial, sans-serif;background-color:
lightcyan;border-color: white;">&nbsp; Clear &nbsp;</button>
    </div>
    <script src="/Users/jkeah/OneDrive/Desktop/sprint 3/script.js"></script>
</body>
</html>
```

About

```
<!DOCTYPE html>
<html class="about">
  <head> <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Digital Naturalist</title>
    <link rel="style.css" href="https://fonts.googleapis.com/css2
family=montserrat&display=swap">
    <link rel="stylesheet" href="style.css">
  </head>
  <body class="ad" background="C:\Users\jkeah\OneDrive\Desktop\5333978.jpg"></body>
    <nav class="navbar">
      <a href="Home.html">Home</a>
      <a href="Image processing.html">Image processing</a>
      <a href="about.html">About</a>
    </nav>
    <div class="about-section">
      <h1>About Us Page</h1>
      <p>Some text about who we are and what we do.</p>
      <p>Resize the browser window to see that this page is responsive by the way.</p>
    </div>
    <h2 style="text-align:center">Our Team</h2>
    <div class="row">
      <div class="column">
        <div class="card">
          <img src="" alt="keshav" style="width:100%">
          <div class="container">
            <h2>J.KESHAHA KUMAR</h2>
            <p class="title">Team leader</p>
            <p>Some text that describes me lorem ipsum lorem.</p>
            <p><button class="button">Contact</button></p>
          </div>
        </div>
      </div>
      <div class="column">
```

```

    <div class="card">
      <img src="" alt="arun" style="width:100%">
      <div class="container">
        <h2>K.ARUN KUMAR</h2>
        <p class="title">Team member-1</p>
        <p>Some text that describes me lorem ipsum lorem.</p>
        <p><button class="button">Contact</button></p>
      </div>
    </div>
  </div>
  <div class="column">
    <div class="card">
      <img src="" alt="balaji" style="width:100%">
      <div class="container">
        <h2>C.BALAJI</h2>
        <p class="title">Team member-2</p>
        <p>Some text that describes me lorem ipsum ipsum lorem.</p>
        <p><button class="button">Contact</button></p>
      </div>
    </div>
  </div>
  <div class="column">
    <div class="card">
      <img src="" alt="kannan" style="width:100%">
      <div class="container">
        <h2>M.KANNAN</h2>
        <p class="title">Team member-3</p>
        <p>Some text that describes me lorem ipsum ipsum lorem.</p>
        <p><button class="button">Contact</button></p>
      </div>
    </div>
  </div>
  <div class="w-full pt-16 pb-6 text-sm text-center md:text-left fade-in">
    <a class="text-gray-500 no-underline hover:no-underline"
      href="https://github.com/IBM-EPBL/IBM-Project-47795-1660802317">&copy;
Digital Naturalist</a>
  </div>
</div>
</body>
</html>

```

Image.css

```

  .{
margin: 0px;
padding: 0px;
box-sizing: border-box;

```

```
}
body{
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: 100% 100%;
  font-family: "Raleway",sans-serif;
}
.navbar{
  overflow:auto;
  background: linear-gradient(
    135deg,rgba(255,255,255,0.1),rgba(255,255,255,0.1)
  );
  backdrop-filter: blur(21px);
  -webkit-backdrop-filter: blur(21px);
  box-shadow: 0 8px 32px 0 rgba(255,255,255,0.16);
  border-radius: 24px;
}
.navbar a{
  text-align: center;
  float:left;
  color: rgba(192, 80, 23, 0.805);
  padding: 16px 14px;
  text-decoration: none;
  font-size: 17px;
}
.navbar a:hover{
  background-color: blueviolet;
  color: black;
}
.navbar a.active{
  background-color: blue;
  color: white;
}

.form{
  margin: 10vh 55vh ;
  padding: 0px 50px;
}
.form h2 {
  text-align: center;
  color: #583030;
  font-size: 40px;
  font-weight: 400;
}
.form.grid{

  margin-top: 100%;
  display:flex;
```

```
flex-wrap: wrap;
}
.form .grid .form-element {
  width:200px;
  height:200px;
  box-shadow:0px 0px 20px 5px rgba(100,100,100,0.1);
}
.form .grid .form-element input {
  display:none;
}
.form .grid .form-element img {
  width:100%;
  height:100%;
  object-fit:cover;
}
.form .grid .form-element div {
  text-align: center;
  position:relative;
  height:40px;
  margin-top:-40px;
  background:rgba(0,0,0,0.5);
  line-height:40px;
  font-size:13px;
  color:#f5f5f5;
  font-weight:600;
}
.form .grid .form-element div span {
  font-size:40px;
}
```

Style.css

```
body.ab{
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: 100% 100%;
}
.navbar{
  overflow:auto;
  background: linear-gradient(
    135deg,rgba(255,255,255,0.1),rgba(255,255,255,0.1)
  );
}
```

```
backdrop-filter: blur(21px);
-webkit-backdrop-filter: blur(21px);
box-shadow: 0 8px 32px 0 rgba(255,255,255,0.16);
border-radius: 24px;
}
.navbar a{
  text-align: center;
  float:left;
  color: rgba(192, 80, 23, 0.805);
  padding: 16px 14px;
  text-decoration: none;
  font-size: 17px;
}
.navbar a:hover{
  background-color: blueviolet;
  color: black;
}
.navbar a.active{
  background-color: blue;
  color: white;
}
div{
  text-align: center;
  margin-top: 100px;
}
p{
  text-align: justify;
  margin-left: 450px;
  width: 40%;
  height: 20%;
  padding: 25px;
  font-size: x-large;
  color: rgb(8, 0, 90);
  display: table;
  margin: auto;
  background: linear-gradient(
    135deg,rgba(255,255,255,0.1),rgba(255,255,255,0.1)
  );
  backdrop-filter: blur(15px);
  -webkit-backdrop-filter: blur(15px);
  box-shadow: 0 8px 32px 0 rgba(255,255,255,0.16);
  border-radius: 24px;
}
h4{
  text-align: center;
```

```
color: rgb(225, 0, 255);
font-size: 20px;
}

body.ad{
background-repeat: no-repeat;
background-attachment: fixed;
background-size: 100% 100%;
}
```

Script.js

```
function previewBeforeUpload(id){
document.querySelector("#"+id).addEventListener("change",function(e){
    if(e.target.files.length == 0){
        return;
    }
    let file = e.target.files[0];
    let url = URL.createObjectURL(file);
    document.querySelector("#"+id+"-preview div").innerText = file.name;
    document.querySelector("#"+id+"-preview img").src = url;
});
}
previewBeforeUpload("file");
```

GitHub:

<https://github.com/IBM-EPBL/IBM-Project-47795-1660802317>

Demo Link:

https://drive.google.com/drive/folders/1FlfCGmf5UK0IG7V9XyCyTyjbwYg4DK6J?usp=share_link
