DIGITAL NATURALIST – AI ENABLED TOOL FOR BIODIVERSITY RESEARCHERS

IBM NALAIYA THIRAN PROJECT REPORT

submitted by

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in partial fulfillment for the award of the degree of

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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 andother 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)andget 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 biodiversityso 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 inanalyses. 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 new data.

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 biodiversityand 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.

LITERATURE SURVEY

2.1 Existing problem

- We don't see that difference societies respond to these 'objective truths' in the same way. For example, sacrifice and the pain it brings are observable as abhorrent in our 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, andcannot 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, whichwe knowto be true. from our experience .
- If we could define one thing as good, such as pleasure, 'is pleasure good?' would be a contradictoryquestion 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 inSocial 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]

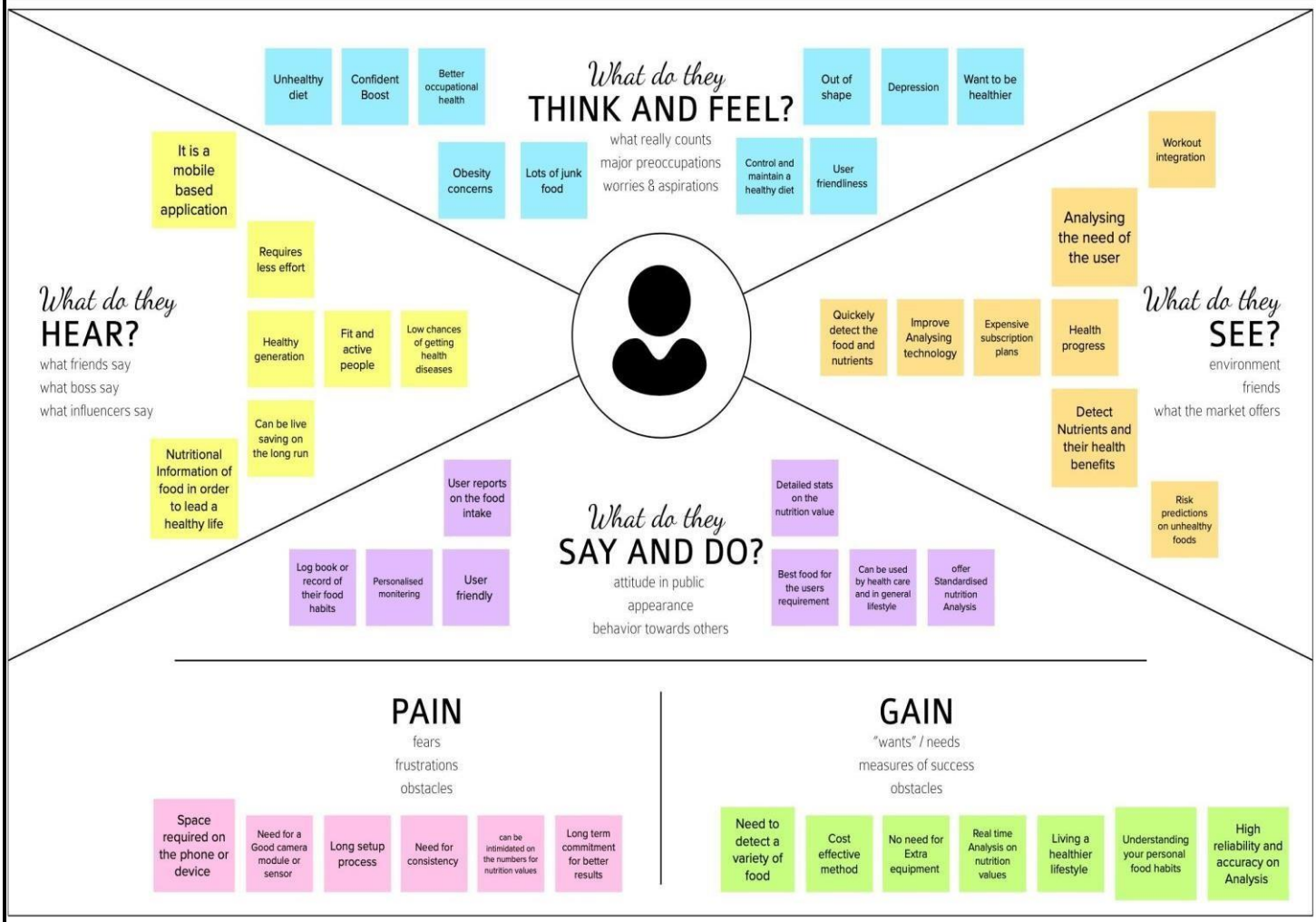
- Future Challenges For Engagement Data Collection and Data Quality[Marya Loffain , JensIegensand ,2021]
- Digitilization to Achieve Sustainable Development Goals[Marcia E. Mondejar , Sergi Garcia Segura2020]

2.3 Problem Statement Definition

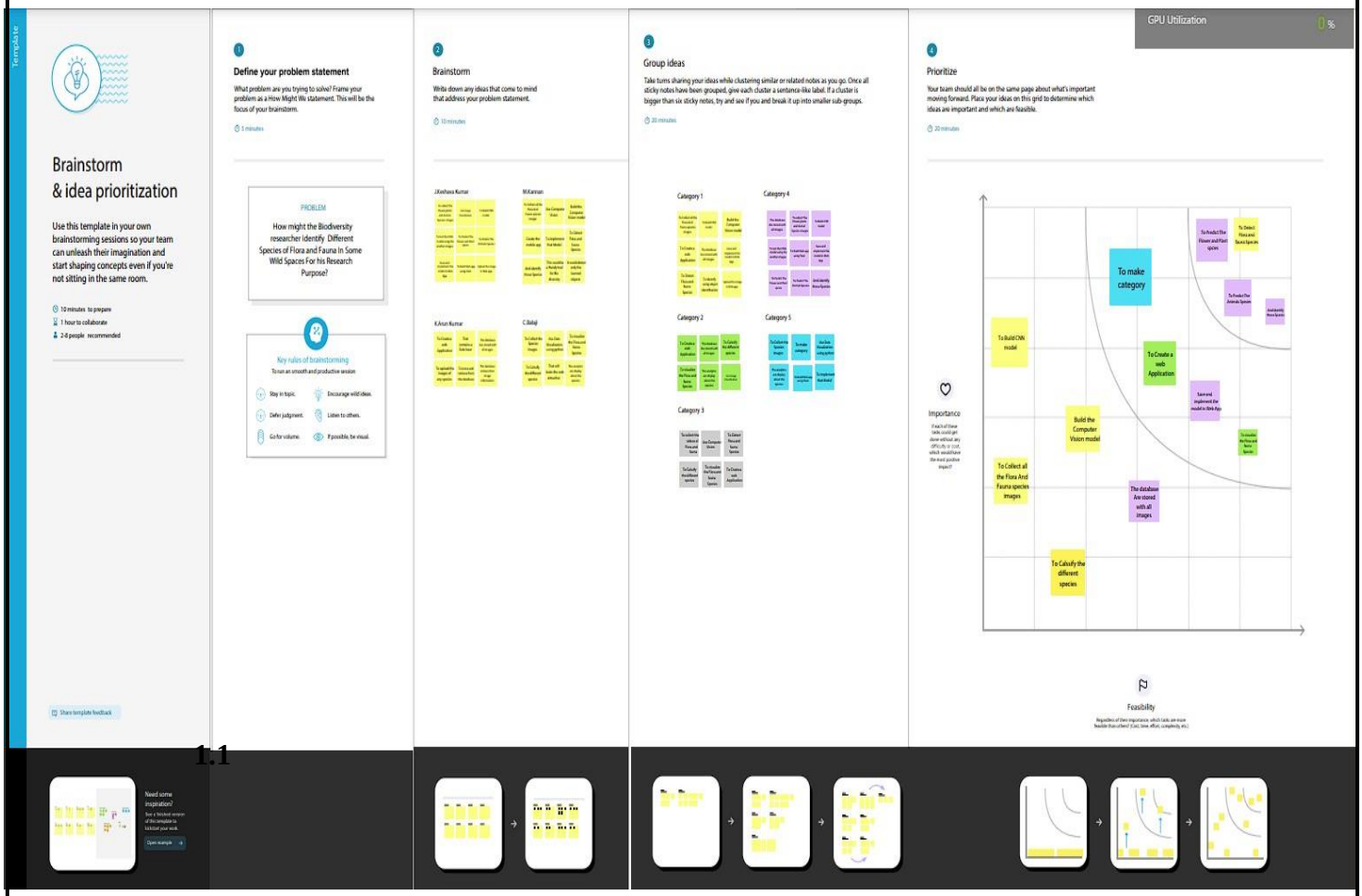
The main aim of the project is to building a model which is used for classifying the fruit dependson the different characteristics like colour, shape, texture etc. Here the user can capture the images of different fruits and then the image will be sent the trained model. The model analysesthe image and detect the nutrition based on the fruits like (Sugar, Fibre, Protein, Calories, etc.).

3 IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2Ideation and Brainstroming



1.1

1.1 undo problem with your customer and that the solution you have realized Proposed Solution

Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	**i)** How might we help both experienced and inexperienced user to identify species of plants and animals and their characteristics with related information? **ii)** Inexperienced users need to know about poisonous plants and dangerous animals so that they can stay away from it. **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. **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.
2.	Idea / Solution description	**i)** Display Botanical names **ii)** Display alert messages for plants/animals using different colours **iii)** small description about them **iv)** Rarities of the species **v)** What disease does the plant cure
3.	Novelty / Uniqueness	**i)** Providing alerts based on if a species is harmful or not **ii)** Alerting the user on the rarity of the species **iii)** Gives the complete description about the species being viewed **iv)** If the plant being viewed has a medicinal value , it gives a description about it. **v)** Display the scientific name of the species.
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)	**i)** Can make money through subscription based. **ii)** Partnership with many laboratories and scientists around the world
6.	Scalability of the Solution	**i)** As the usage and user base of this application grows more feature can be added to the premium or subscription model. **ii)** We can introduce subscription models like free plan, business plan, educational plan and many more based on its usage **iii)** As the usage increase we can scale the application by releasing more languages based on the geographical usage.

1.1 Problem Solution fit

The Problem-Solution Fit simply means that you have for it actually solves the customer's , marketer sand corporate innovators identify behavioral patterns.

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 behaviour.

Sharpen your communication and marketing strategy with the right

trigger sand messaging.

Increase touch-points with your company by finding the right problem-behaviour 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

- Ornithologist
- Students
- Hikers
- Migrators
- Biologist
- Zoologist
- Tourister
- Research people

6. CUSTOMER CONSTRAINTS CC

- Network issues
- Insufficient knowledge about the biodiversity.
- Cannot remember all the basic life saving tips
- Making observations among species.

5. AVAILABLE SOLUTIONS AS

- 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

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

2. JOBS-TO-BE-DONE / PROBLEMS J&P

- 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

- complexities in identification
- Information gathering
- Need to depend on external resources
- Large dataset
- Money problem
- Depend upon Guide

7. BEHAVIOUR BE

- Volunteering for jobs where we can actively work with wildlife
- Finding rare and endangered species of flora and fauna and help them navigate in current

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

Identify strong TR & EM

3. TRIGGERS TR

- 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 SL

- 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 CH

8.1 ONLINE

- Capture image and search it
- Browse using the internet

8.2 OFFLINE

- Hand notes
- Getting the information from experienced user

Identify strong TR & EM

4. EMOTIONS: BEFORE / AFTER EM

- Co2 to o2
- Imbalanced world to sustainable world
- Accumulation of waste to renewable energy

REQUIREMENT ANALYSIS

4.1 Functional requirement

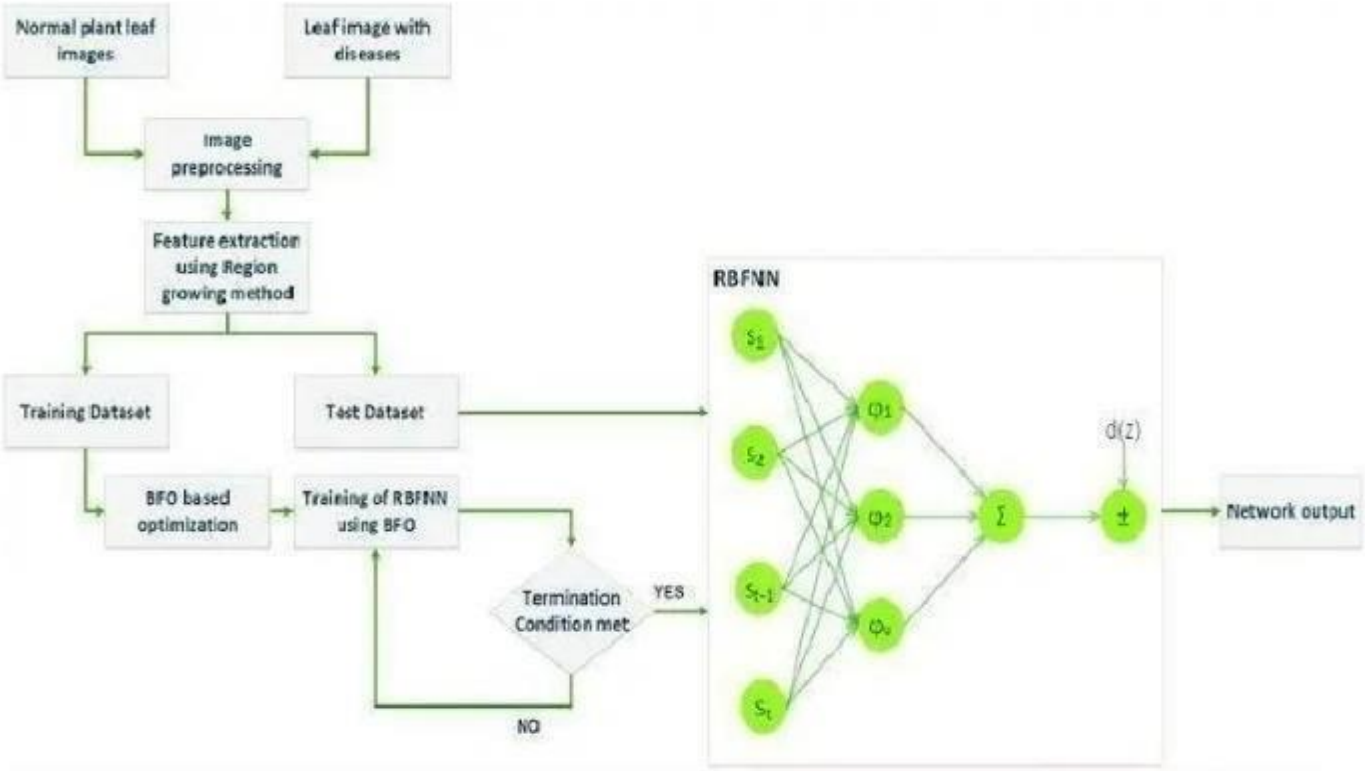
- The task of detection/classification is not easy as it seems. All possible options related tothe given Image.
- Image classification, object detection, segmentation, face recognition. Classification of crystal structure using a convolutional neural network
- Nutrition is vital to the growth of the human body. Nutritional analysis guarantees that themeal 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 tothe 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,” buthas 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 aquick text label, and the app estimates the calorie content.
- This software collaborated with IBM’s natural language capability to provide 24-hourassistance and dietary recommendations.

1.1 Non Technical Requirement

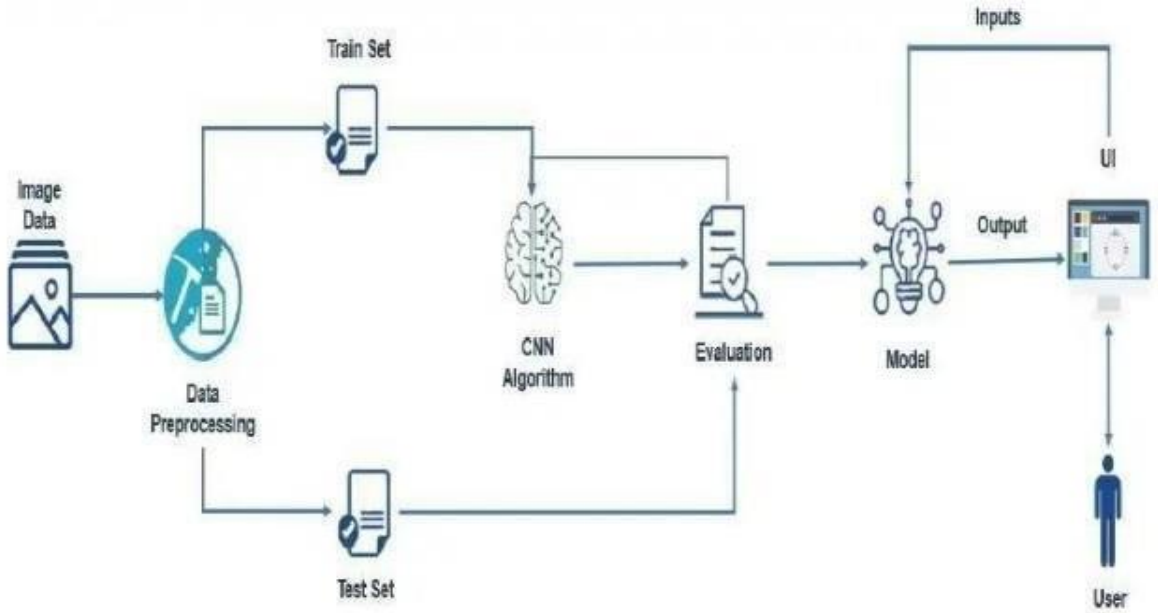
- The comparison of the proposed model with the conventional models shows that the results of this model are exceptionally good and promising to use in real-world applications.
- This sort of higher accuracy and precision will work to boost the machine'sgeneral efficiency in fruit recognition more appropriately.
- A generic model for the dietary protein requirement (as with any nutrient)defines there equipment 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.

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. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-2	Adding more data to avoid overfitting	2	Medium	J. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-3	Building a CNN model using the collected data	5	High	J. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-1		USN-4	Evaluating the model to check the accuracy and precision	3	High	J. KESHAVA 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. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-2		USN-6	Setting up facilities for user to feed the image	2	Medium	J. KESHAVA 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. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-2		USN-8	Model loading – API creation using flask	5	High	J. KESHAVA 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. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-3		USN-10	Cloud deployment – Deployment of application using IBM Cloud	5	High	J. KESHAVA 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. KESHAVA KUMAR K. ARUN KUMAR C. BALAJI M. KANNAN
Sprint-4		USN-12	Non-Functional testing – Checking for user acceptance and integration	5	High	J. KESHAVA 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

2.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/ibm/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 Spliting 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", forc
```

```
[ ] !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
```

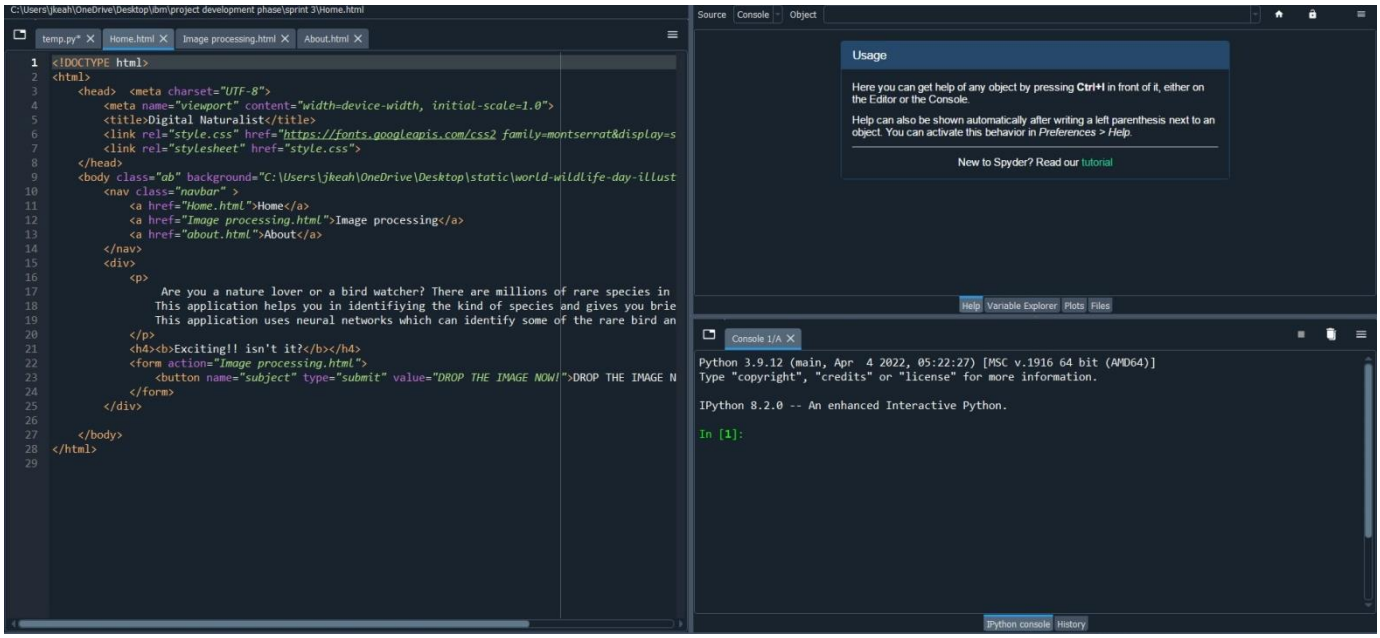
```
[ ] model.save("Digital Naturalist Dataset.h5")
```

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.]],
```

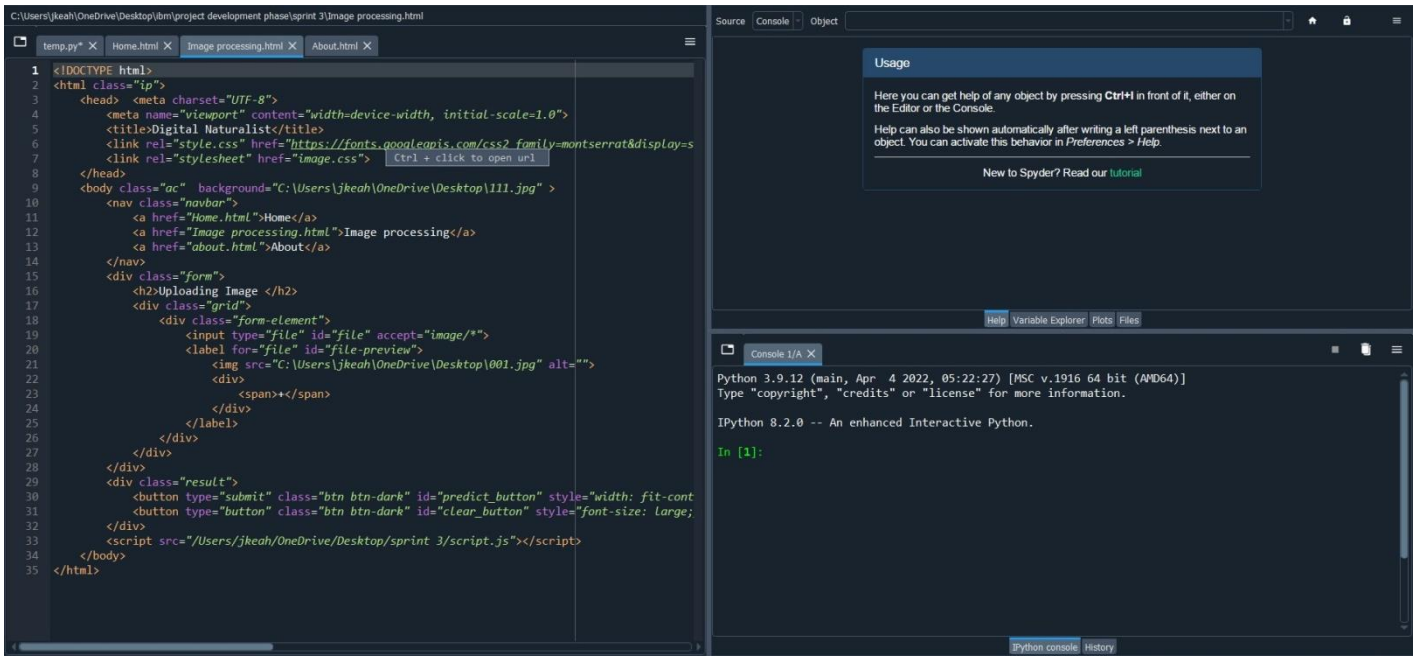
7.2 Feature 2


C:\Users\jkeah\OneDrive\Desktop\ibm\project development phase\sprint 3\Home.html
temp.py* Home.html Image processing.html About.html
<!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=s
<link rel="stylesheet" href="style.css">
</head>
<body class="ab" background="C:\Users\jkeah\OneDrive\Desktop\static\world-wildlife-day-illust
<nav class="navbar" >
Home
Image processing
About
</nav>

Are you a nature lover or a bird watcher? There are millions of rare species in
This application helps you in identifiying the kind of species and gives you brie
This application uses neural networks which can identify some of the rare bird an

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

</body>
</html>
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I 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
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]:
IPython console History


C:\Users\jkeah\OneDrive\Desktop\ibm\project development phase\sprint 3\Image processing.html
temp.py* Home.html Image processing.html About.html
<!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=s
<link rel="stylesheet" href="image.css">
Ctrl + click to open url
</head>
<body class="ac" background="C:\Users\jkeah\OneDrive\Desktop\111.jpg" >
<nav class="navbar">
Home
Image processing
About
</nav>

<h2>Uploading Image </h2>

<input type="file" id="file" accept="image/*">
<label for="file" id="file-preview">
<img src="C:\Users\jkeah\OneDrive\Desktop\001.jpg" alt="">

+

</label>

<button type="submit" class="btn btn-dark" id="predict_button" style="width: fit-cont
<button type="button" class="btn btn-dark" id="clear_button" style="font-size: large;

<script src="/Users/jkeah/OneDrive/Desktop/sprint 3/script.js"></script>
</body>
</html>
Source Console Object
Usage
Here you can get help of any object by pressing Ctrl+I 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.
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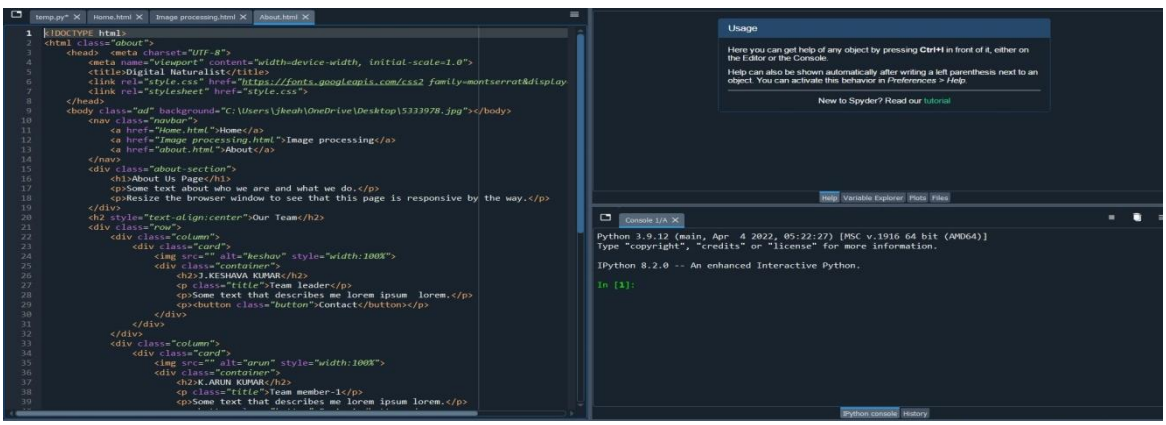
Help Variable Explorer Plots Files
Console 1/A
Python 3.9.12 (main, Apr 4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.
IPython 8.2.0 -- An enhanced Interactive Python.
In [1]:
IPython console History


temp.py* Home.html Image processing.html About.html
<!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
<link rel="stylesheet" href="style.css">
</head>
<body class="ad" background="C:\Users\jkeah\OneDrive\Desktop\5333978.jpg"></body>
<nav class="navbar">
Home
Image processing
About
</nav>

<h1>About Us Page</h1>
Some text about who we are and what we do.
Resize the browser window to see that this page is responsive by the way.

<h2 style="text-align:center">Our Team</h2>

<img src="" alt="keshav" style="width:100%">

<h2>J.KESHAVA KUMAR</h2>
Team leader
Some text that describes me lorem ipsum lorem.
<button class="button">Contact</button>

<img src="" alt="arun" style="width:100%">

<h2>K.ARUN KUMAR</h2>
Team member-1
Some text that describes me lorem ipsum lorem.
Usage
Here you can get help of any object by pressing Ctrl+I 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
Python 3.9.12 (main, Apr 4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)]
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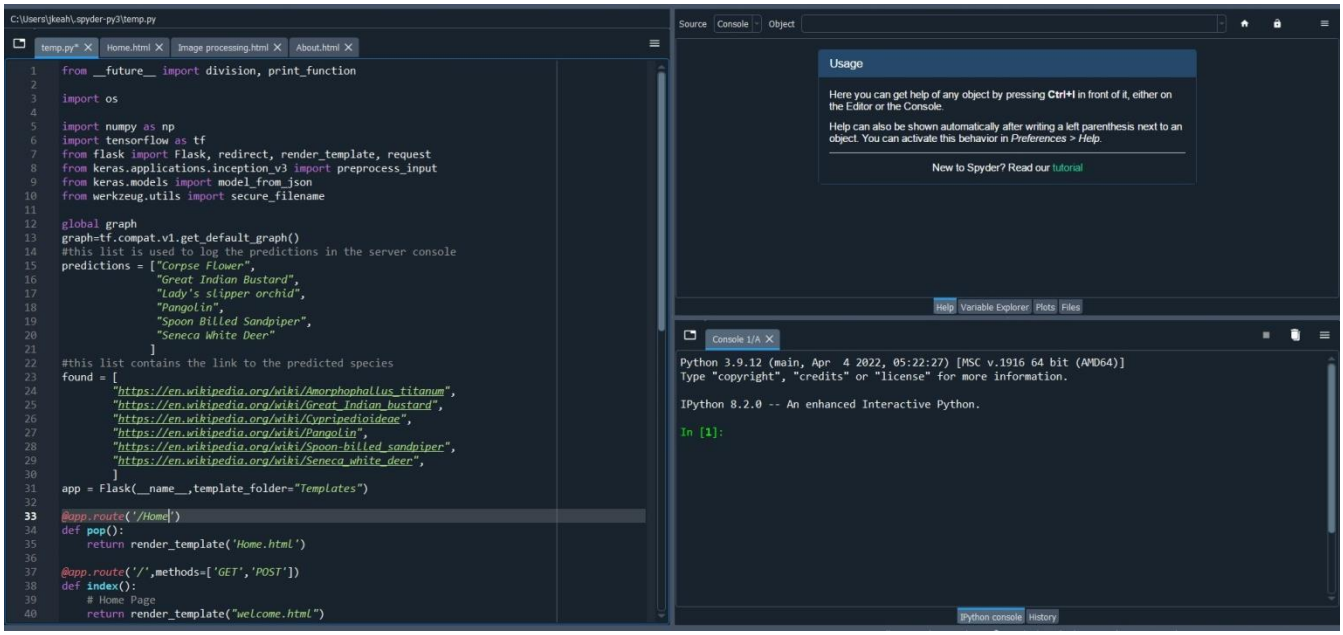
In [1]:
IPython console History

8.TESTING

8.1 TestCases
8.2 User Acceptance Testing

9 RESULTS

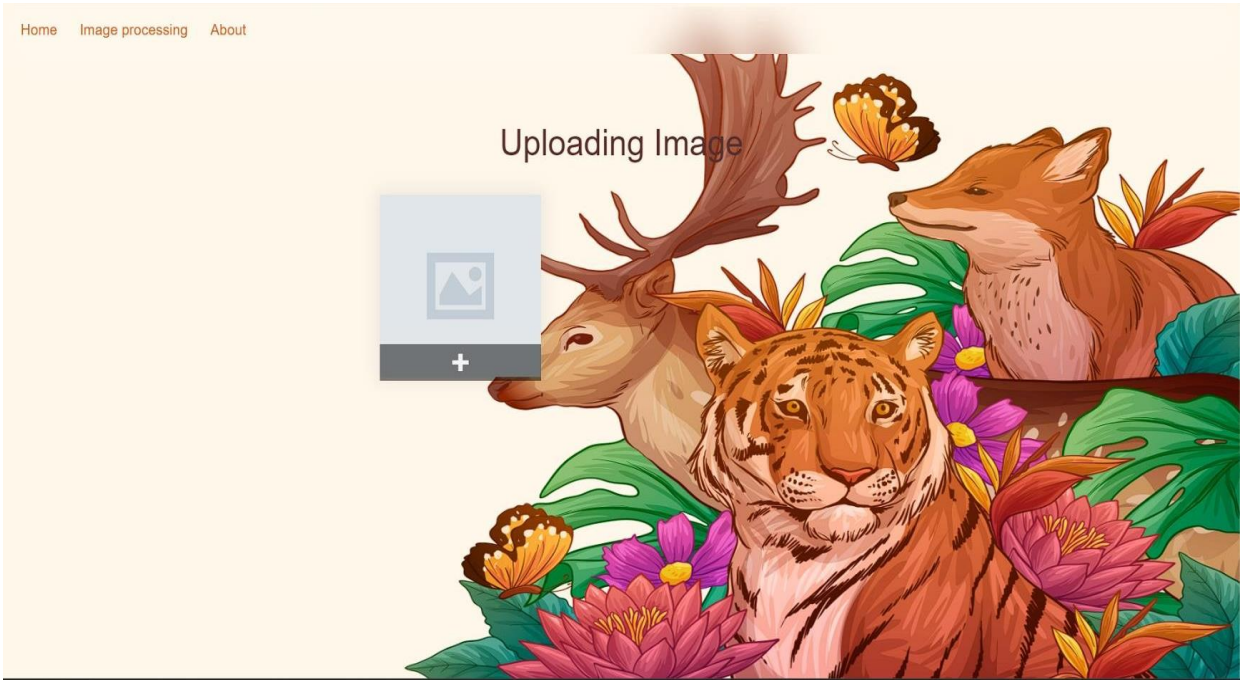
9.2 Performance Metrics

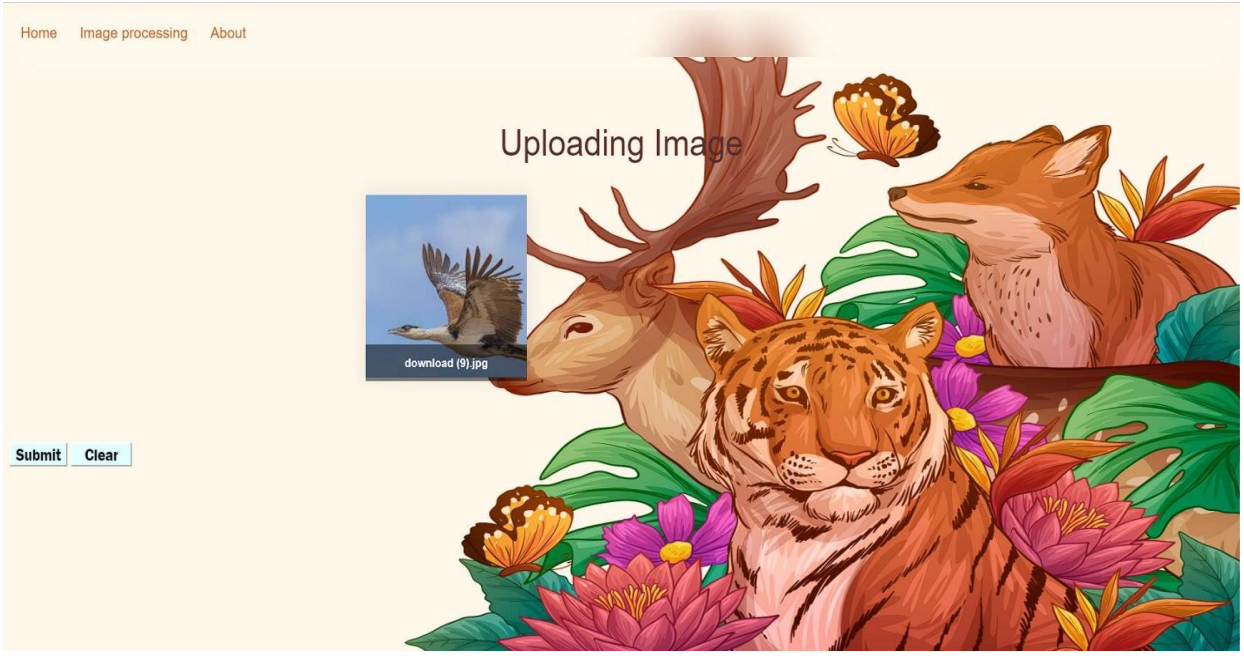


```
from __future__ import division, print_function

import os

import numpy as np
import tensorflow as tf
from flask import Flask, redirect, render_template, request
from keras.applications.inception_v3 import preprocess_input
from keras.models import model_from_json
from werkzeug.utils import secure_filename

global graph
graph=tf.compat.v1.get_default_graph()
#this list is used to log the predictions in the server console
predictions = ["Corpse Flower",
               "Great Indian Bustard",
               "Lady's slipper orchid",
               "Pangolin",
               "Spoon Billed Sandpiper",
               "Seneca White Deer"
              ]
#this list contains the link to the predicted species
found = [
        "https://en.wikipedia.org/wiki/Amorphophallus_titanum",
        "https://en.wikipedia.org/wiki/Great_Indian_bustard",
        "https://en.wikipedia.org/wiki/Cypripedioideae",
        "https://en.wikipedia.org/wiki/Pangolin",
        "https://en.wikipedia.org/wiki/Spoon-billed_sandpiper",
        "https://en.wikipedia.org/wiki/Seneca_white_deer",
        ]
app = Flask(__name__,template_folder="Templates")

@app.route('/Home')
def pop():
    return render_template('Home.html')

@app.route('/',methods=['GET','POST'])
def index():
    # Home Page
    return render_template("welcome.html")
```

```
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]:
```

Output:


Home
Image processing
About
Uploading Image
+


Home
Image processing
About
Uploading Image
download (9).jpg
Submit
Clear

10.Advantages & Disadvantages

Advantages :

- **A naturalist is someone who studies the patterns of nature, identifies a differencekind 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 commonapproaches 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 alsobeing 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 andwe can lead a happy and healthy life with good wealth.
- AI can easily track health behaviors and repetitive exercise patterns and use thedata 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"> Home page


        <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">
```

```
            <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 rarespecies in the nature.
                  This application helps you in identifiying the kind of
    species andgives you brief information about it.
                 This application uses neural networks which can identify some
    of therare 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!">DROPTHE IMAGE NOW!</button>
            </form>
        </div>

    </body>
```

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>
```

```
                    <label for="file" id="file-preview">
                        <img src="C:\Users\jkeah\OneDrive\Desktop\001.jpg"
                        alt="">
                        <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;">  Clear  </button>
```

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>
```

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;
}
```

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;
    });
  }
```