

Project Development Phase

Date	18 November 2022
Team ID	PNT2022TMID07703
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	Total params: 21,885,485 Trainable params: 1,024,005 Non-trainable params: 20,861,480	Attached below
2.	Accuracy	Training Accuracy - 72% Validation Accuracy - 59%	Attached below
3.	Confidence Score (Only Yo1 oProjects)	Class Detected - NILL Confidence Score - NILL	NILL

User Acceptance Testing



We are performing **White Box Testing** for select the package module.

Pseudocode for select the package module is-

1. select_the_package() píoceduíe begins
2. READ the package name, featuíes, offeís and duíation fíom the package database
3. DISPLAY the package name, featuíes, offeís and duíation
4. DO
5. GEI' the package name, featuíes, offeís and duíation
6. SI'ORE the package selected to the customeí's database
7. PROCEED to payment scíeen //anotheí module
8. WHILE select package is NULL
9. //End DO...WHILE
- 10.píoceduíe ends

CYCLOMATIC COMPLEXITY OF RESULTANT GRAPH

$$\begin{aligned}V(G) &= \text{Number of regions} \\ &= 2\end{aligned}$$

$$\begin{aligned}V(G) &= \text{Edges}-\text{Nodes}+2 \\ &= 8-8+2 \\ &= 2\end{aligned}$$

$$\begin{aligned}V(G) &= \text{Predicate nodes}+1 \\ &= 1+1 \\ &= 2\end{aligned}$$

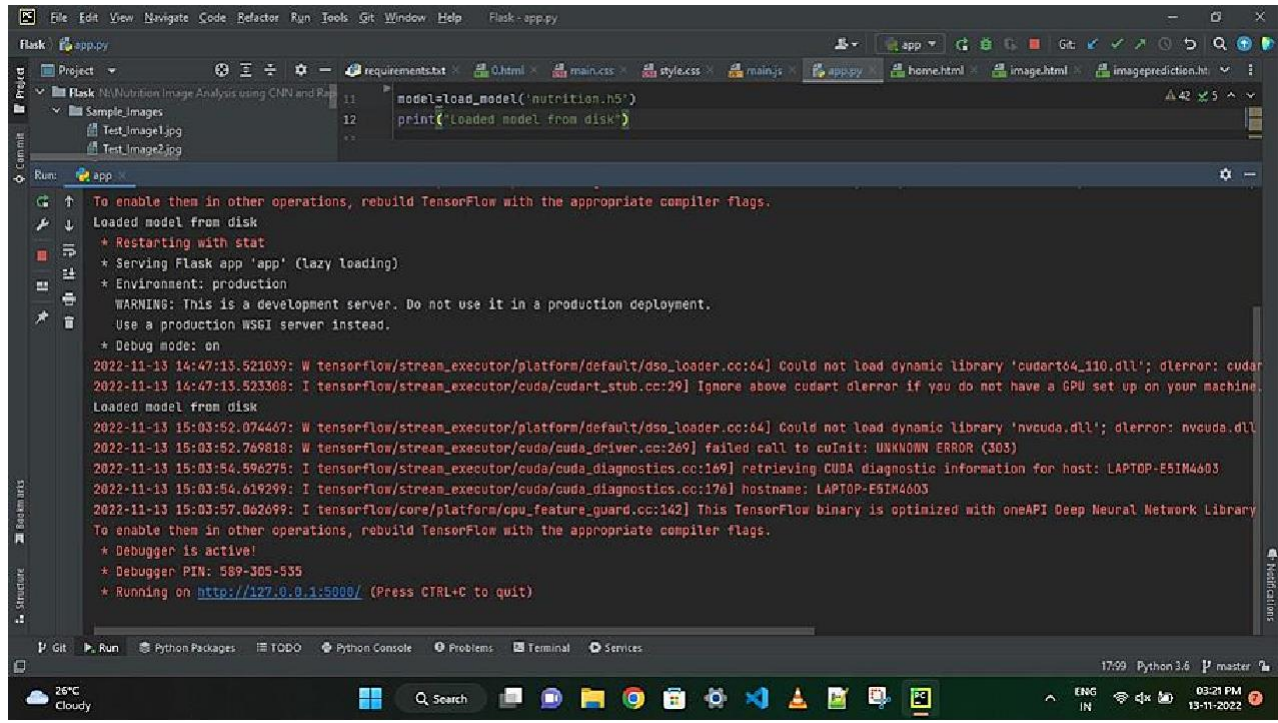
LINEARLY INDEPENDENT PATHS FOR FLOW GRAPHS

Path 1: 1-2-3-4-5-6-7-8-9-10

Path 2: 1-2-3-4-5-6-7-8-4-5-6-7-8-9-10

TEST ID	INPUT VALUES	ACTUAL OUTPUT	EXPECTED OUTPUT
1	Package is selected	To be observed after execution	Display the selected package
2	Package is not selected	To be observed after execution	Show the packages to select until one is selected

Performance Testing

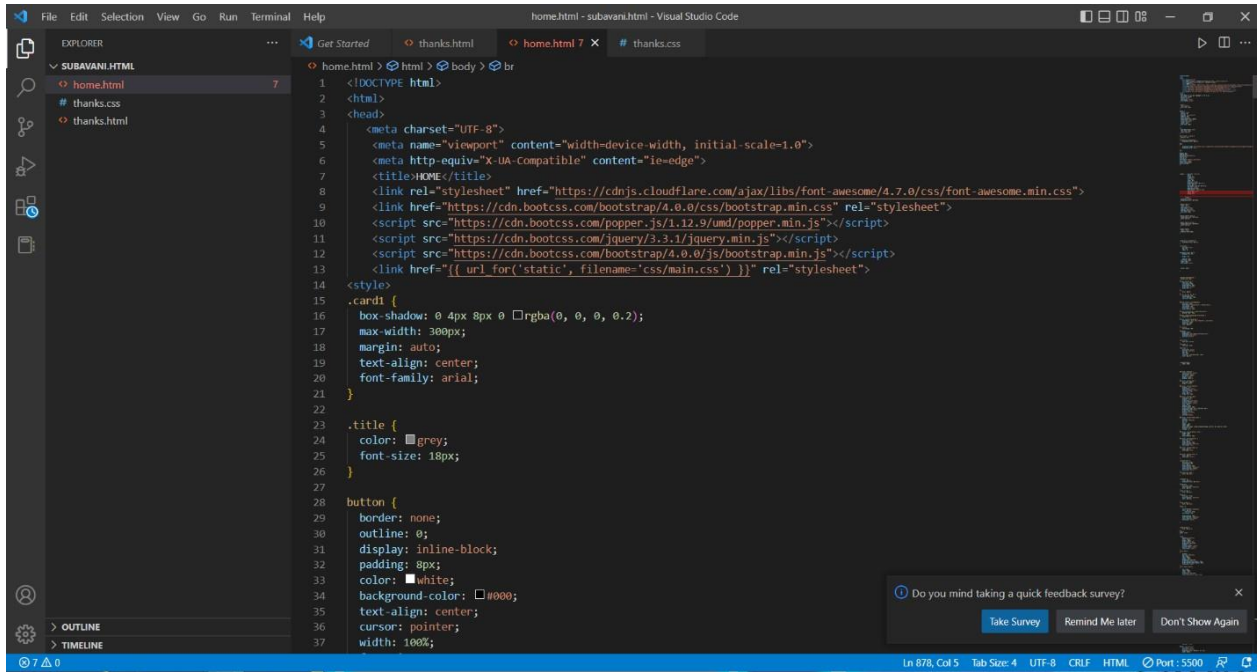


```
Flask - app.py
Project
  Flask - Nutrition Image Analysis using CNN and RNN
    Sample_Images
      Test_Image1.jpg
      Test_Image2.jpg
    app.py
    requirements.txt
    .html
    main.css
    style.css
    main.js
    home.html
    image.html
    imageprediction.html
    ...
Run: app
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
Loaded model from disk
* Restarting with stat
* Serving Flask app 'app' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: on
2022-11-13 14:47:13.521039: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'cudart64_110.dll'; dlerror: cudart64_110.dll not found
2022-11-13 14:47:13.523308: 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.
Loaded model from disk
2022-11-13 15:03:52.074467: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'nvcuda.dll'; dlerror: nvcuda.dll not found
2022-11-13 15:03:52.769818: W tensorflow/stream_executor/cuda/cuda_driver.cc:269] failed call to cuInit: UNKNOWN ERROR (303)
2022-11-13 15:03:54.596275: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:169] retrieving CUDA diagnostic information for host: LAPTOP-E5IM4603
2022-11-13 15:03:54.619299: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:176] hostname: LAPTOP-E5IM4603
2022-11-13 15:03:57.062699: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
* Debugger is active!
* Debugger PIN: 589-305-535
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

Future Scope:

- Offer payment convenience in personal training subscriptions.
- Useful articles.
- Video instructions.
- Diet Plans.
- Individual progress tracking.

SCREENSHOTS:



Data Collection

Download the dataset [here](#)

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

Mounted at /content/drive

```
[ ] cd/content/drive/MyDrive/Colab Notebooks
```

/content/drive/MyDrive/Colab Notebooks

```
[ ] # Unzipping the dataset
    !unzip 'Dataset.zip'
```

Image Preprocessing

```
[ ] from keras.preprocessing.image import ImageDataGenerator
```

Image Data Augmentation

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

Applying Image DataGenerator Functionality To Trainset And Testset

```
▶ x_train = train_datagen.flow_from_directory(
    r'/content/drive/MyDrive/Colab Notebooks/Dataset/TRAIN_SET',
    target_size=(64, 64), batch_size=5, color_mode='rgb', class_mode='sparse')
x_test = test_datagen.flow_from_directory(
    r'/content/drive/MyDrive/Colab Notebooks/Dataset/TEST_SET',
    target_size=(64, 64), batch_size=5, color_mode='rgb', class_mode='sparse')
```

3. Adding CNN Layers

```
[ ] classifier = Sequential()
    classifier.add(Conv2D(32, (3, 3), input_shape=(64, 64, 3), activation='relu'))
    classifier.add(MaxPooling2D(pool_size=(2, 2)))
    classifier.add(Conv2D(32, (3, 3), activation='relu'))
    classifier.add(MaxPooling2D(pool_size=(2, 2)))
    classifier.add(Flatten())
```

4. Adding Dense Layers

```
[ ] classifier.add(Dense(units=128, activation='relu'))
    classifier.add(Dense(units=5, activation='softmax'))
```

```
▶ classifier.summary()
```

Model: "sequential_1"

Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 62, 62, 32)	896

5. Configure The Learning Process

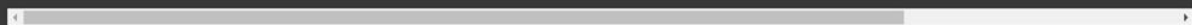
```
[ ] classifier.compile(optimizer='adam', loss='sparse_categorical_crossentropy', metrics=['accuracy'])
```

6. Train The Model

```
[ ] classifier.fit_generator(generator=x_train, steps_per_epoch = len(x_train), epochs=20, validation_data=x_test, validation_steps = len(x_test))
```

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:2: UserWarning: 'Model.fit_generator' is deprecated and will be removed in a future version. P]

Epoch 1/20
494/824 [=====]..... - ETA: 6:52 - loss: 0.7194 - accuracy: 0.7174



7. Saving The Model

```
[ ] classifier.save('nutrition.h5')
```



```
Flask - imageprediction.html
File Edit View Navigate Code Refactor Run Tools Git Window Help
Project
  Flask N:\Nutrition Image Analysis using CNN and Ra
    Sample_Images
      Test_Image1.jpg
      Test_Image2.jpg
      Test_Image3.jpg
      Test_Image4.jpg
      Test_Image5.jpg
      Test_Image11.jpg
    static
      css
        main.css
        style.css
      js
        main.js
    templates
      0.html
      home.html
      image.html
      imageprediction.html
    uploads
      app.py
      nutrition.h5
      requirements.txt
  External Libraries
    Python 3.6 > C:\Users\ARUNKUMARHARI\cond
      Binary Skeletons
        google
        grpc
        h5py
      Pip (python3.6.2)
requirements.txt
0.html
main.css
style.css
main.js
home.html
image.html
imageprediction.html
app.py
nutrition.h5
requirements.txt
Python 3.6 > C:\Users\ARUNKUMARHARI\cond
Binary Skeletons
  google
  grpc
  h5py
Pip (python3.6.2)
html body
190 <body>
191 <div class="header">
192 <div style="...">NUTRITION IMAGE ANALYSIS</div>
193 <div class="topnav-right" style="...">
194
195 <a href="{{ url_for('home') }}"><b>HOME</b></a>
196 <a class="active" href="{{ url_for('image1') }}"><b>CLASSIFY</b></a>
197 </div>
198 </div>
199 <br>
200
201
202 </div>
203 <div class="container">
204 <center>
205 <div id="content" style="...">{% block content %}{% endblock %}</div></center>
206 </div>
207 </body>
208
209 <footer>
210 <script src="{{ url_for('static', filename='js/main.js') }}" type="text/javascript"></script>
211 </footer>
212
213 </html>
214
```

```
Flask - 0.html
File Edit View Navigate Code Refactor Run Tools Git Window Help
Project
  Flask N:\Nutrition Image Analysis using CNN and Ra
    Sample_Images
      Test_Image1.jpg
      Test_Image2.jpg
      Test_Image3.jpg
      Test_Image4.jpg
      Test_Image5.jpg
      Test_Image11.jpg
    static
      css
        main.css
        style.css
      js
        main.js
    templates
      0.html
      home.html
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        grpc
        h5py
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requirements.txt
0.html
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main.js
home.html
image.html
imageprediction.html
app.py
nutrition.h5
requirements.txt
Python 3.6 > C:\Users\ARUNKUMARHARI\cond
Binary Skeletons
  google
  grpc
  h5py
Pip (python3.6.2)
html
4 <style>
5
6 </style>
7
8 <meta charset="utf-8">
9 <title>NUTRITION IMAGE ANALYSIS</title>
10 <link rel="shortcut icon" href="{{ url_for('static', filename='diabetes-favicon.ico') }}">
11 <link rel="stylesheet" type="text/css" href="{{ url_for('static', filename='style.css') }}">
12 <script src="https://kit.fontawesome.com/5f3f547070.js" crossorigin="anonymous"></script>
13 <link href="https://fonts.googleapis.com/css2?family=Pacifico&display=swap" rel="stylesheet">
14 </head>
15
16 <div class="results">
17 <p style="..."><h4 style="...">IMAGE CLASSIFIED IS : <h4><b><h4 style="..."><u>{{showcase1}}</u><h4><br>
18 </div>
19 <br>
20 <br>
21
22 </div>
23 </body>
24 </html>
Closing tag matches nothing
22:11 CRLF UTF-8 Tab Python 3.6 master
```

