Sprint 4

Team ID	PNT2022TMID13764
Project Name Project	AI-Powered Nutrition Analyzer for Fitness Enthusiasts

Model Creation

Importing libraries

```
import numpy as np

import tensorflow as tf

from tensorflow.keras.models import Sequential

from tensorflow.keras import layers

from tensorflow.keras.layers import Dense,Flatten

from tensorflow.keras.layers import Conv2D,MaxPooling2D,Dropout

from keras.preprocessing.image import ImageDataGenerator
```

Initializing the Model

```
model = Sequential()
```

Adding CNN Layers

```
classifier = Sequential()

# First convolution layer and pooling

classifier.add(Conv2D(32, (3, 3), input_shape=(64, 64, 3), activation='relu'))

classifier.add(MaxPooling2D(pool_size=(2, 2)))


# Second convolution layer and pooling

classifier.add(Conv2D(32, (3, 3), activation='relu'))
# input_shape is going to be the pooled feature maps from the previous convolution layer

classifier.add(MaxPooling2D(pool_size=(2, 2)))


# Flattening the layers

classifier.add(Flatten())
```

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

max_pooling2d (MaxPooling2D  (None, 31, 31, 32)        0
)

conv2d_1 (Conv2D)            (None, 29, 29, 32)        9248

max_pooling2d_1 (MaxPooling  (None, 14, 14, 32)        0
2D)

flatten (Flatten)            (None, 6272)              0

dense (Dense)                (None, 128)               802944

dense_1 (Dense)              (None, 5)                 645

=================================================================
Total params: 813,733
Trainable params: 813,733
Non-trainable params: 0
_________________________________________________________________
```

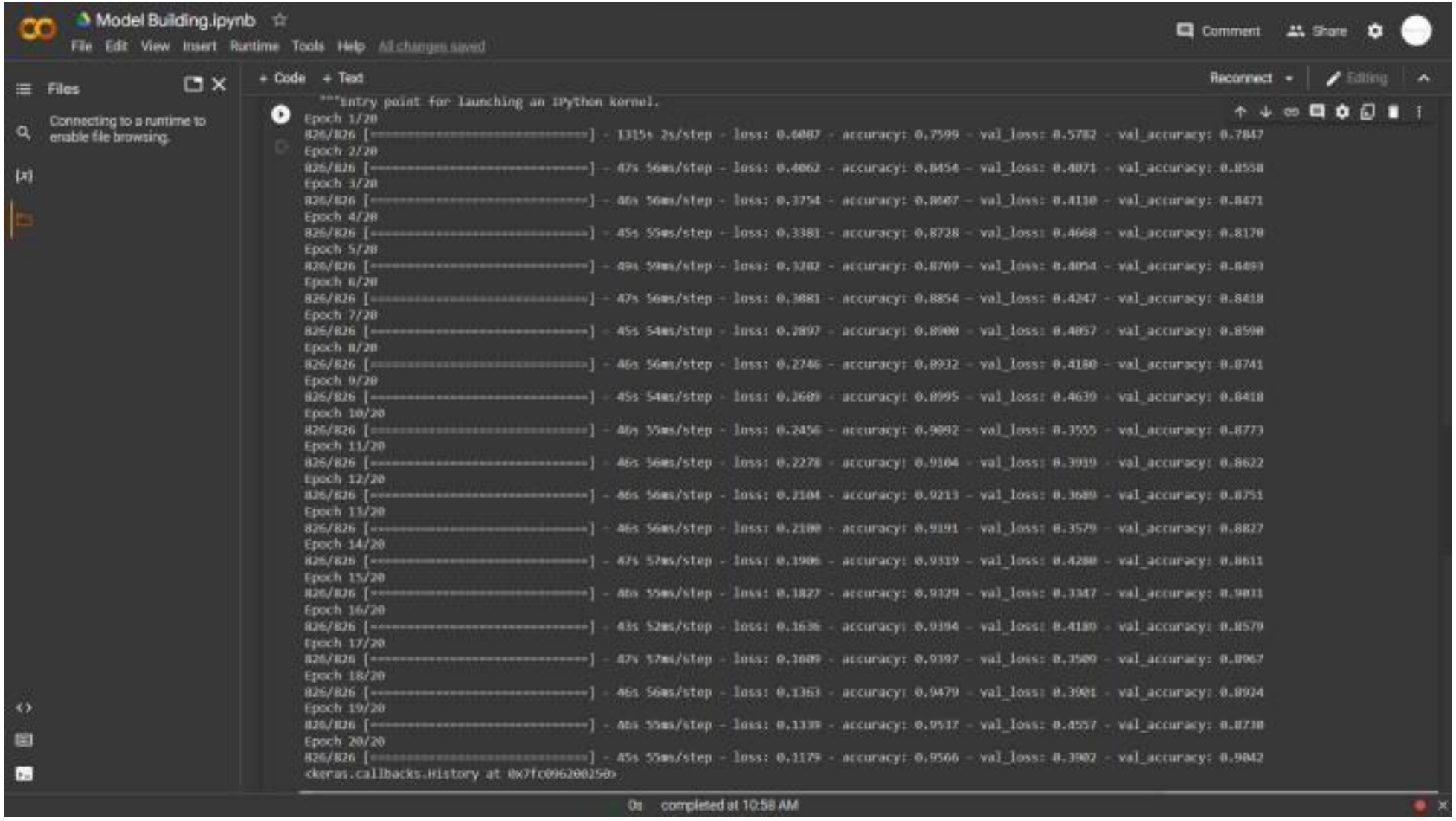
Configure the Learning Process

Compiling the CNN

```
# categorical_crossentropy for more than 2

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

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))
```



Save the Model

classifier.save('ainutrition.h5')

Test the Model

#Predict the results

from tensorflow.keras.models import load_model

from keras.preprocessing import image from

keras_preprocessing.image import load_img

model = load_model("ainutrition.h5")

from tensorflow.keras.utils import img_to_array
#loading of the image

img = load_img(r'/content/drive/MyDrive/DataSet-IBM/TEST_SET/ORANGE/n07749192_1251.jpg', grayscale=False,

target_size= (64,64))

#image to array

```
x = img_to_array(img)

#changing the shape

x = np.expand_dims(x,axis = 0)

predict_x=model.predict(x)

classes_x=np.argmax(predict_x,axis=-1)

classes_x
```

```
1/1 [==============================] - 0s 107ms/step
array([2])
```

```
index=['APPLES', 'BANANA', 'ORANGE','PINEAPPLE','WATERMELON']

result=str(index[classes_x[0]])

result
```

```
'ORANGE'
```

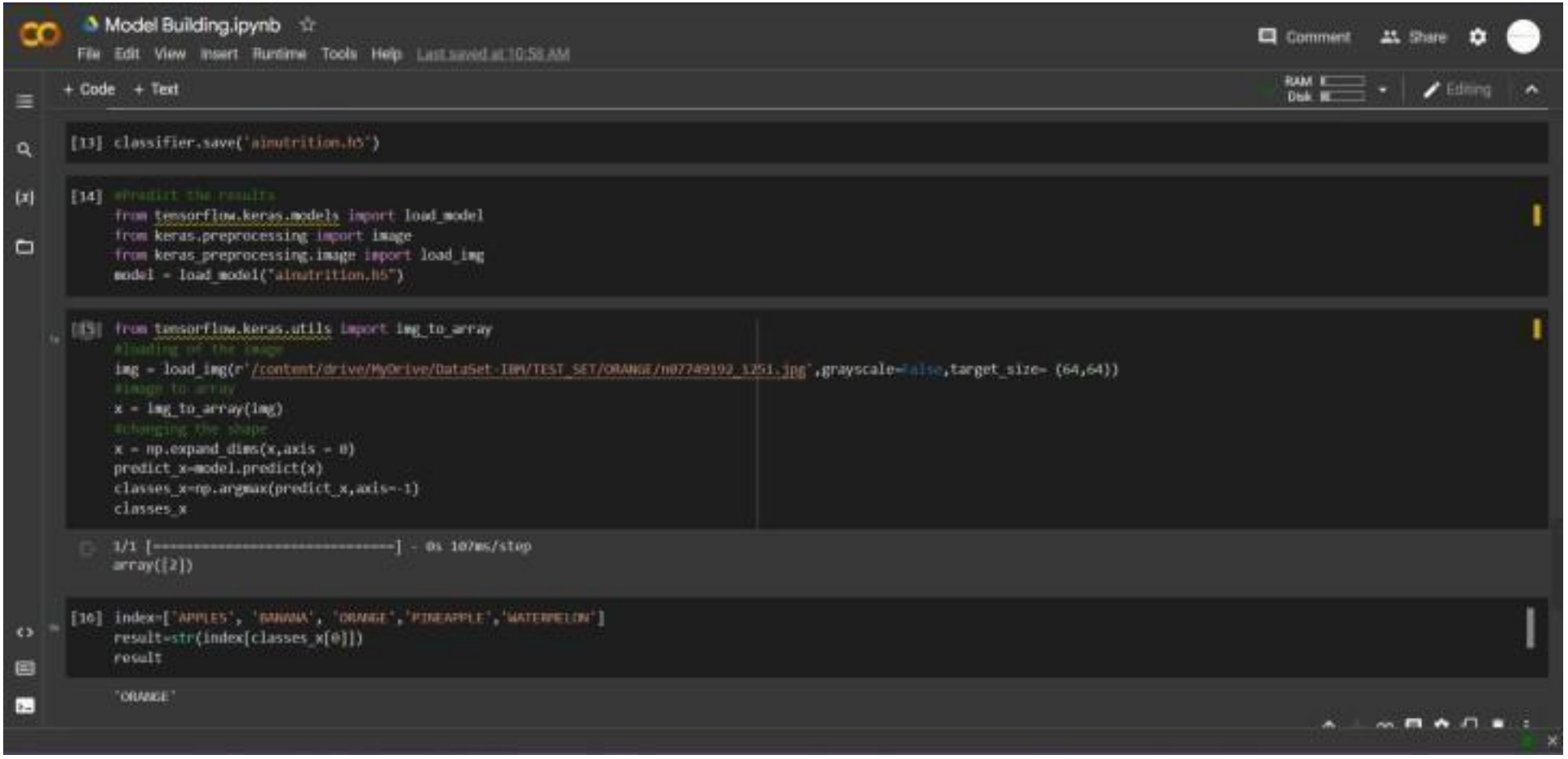
```
print(result)

if result == 'APPLES':

  print("One serving, or one medium apple, provides about 95 calories, 0 gram fat, 1 gram protein, 25 grams carbohydrate, 19 grams sugar (naturally occurring), and 3 grams fiber.")

elif result == 'BANANA':
  print("One serving, or one medium ripe banana, provides about 110 calories, 0 gram fat, 1 gram protein, 28 grams carbohydrate, 15 grams sugar (naturally occurring), 3 grams fiber, and 450 mg potassium.")

elif result == 'ORANGE':

  print("60 calories, No fat or sodium, 3 grams of fiber, 12 grams of sugar, 1 gram of protein, 14 micrograms of vitamin A, 70 milligrams of vitamin C, 6% of your daily recommended amount of calcium.")

elif result == 'PINEAPPLE':

  print("Calories: 83, Fat: 1.7 grams, Protein: 1 gram, Carbs: 21.6 grams, Fiber: 2.3 grams, Vitamin C: 88% of the
```

Daily Value (DV), Manganese: 109% of the DV, Vitamin B6: 11% of the DV.")

elif result == 'WATERMELON':

print("Calories: 46, Carbs: 11.5 grams, Fiber: 0.6 grams, Sugar: 9.4 grams, Protein: 0.9 grams, Fat: 0.2 grams, Vitamin A: 5% of the Daily Value (DV), Vitamin C: 14% of the DV.")

Model Building


Model Building.ipynb
File Edit View Insert Runtime Tools Help Last saved at 10:58 AM
Comment
Share
+ Code + Text
RAM
Disk
Editing
[13] classifier.save('ainutrition.h5')
[14] #Predict the results
from tensorflow.keras.models import load_model
from keras.preprocessing import image
from keras_preprocessing.image import load_img
model = load_model("ainutrition.h5")
[15] from tensorflow.keras.utils import img_to_array
#loading of the image
img = load_img(r'/content/drive/MyDrive/DataSet-IBM/TEST_SET/ORANGE/n07749192_1251.jpg',grayscale=False,target_size= (64,64))
#image to array
x = img_to_array(img)
#changing the shape
x = np.expand_dims(x,axis = 0)
predict_x=model.predict(x)
classes_x=np.argmax(predict_x,axis=-1)
classes_x
1/1 [==============================] - 0s 107ms/step
array([2])
[16] index=['APPLES', 'BANANA', 'ORANGE','PINEAPPLE','WATERMELON']
result=str(index[classes_x[0]])
result
'ORANGE'

Webpage

Know Your Food Calorie

Know live food calories & nutrition information from a single food image

Choose File n07749192_1251.jpg

Submit

Instructions:

Limitations

- The image size must be under 1024KB.
- The image format must be in JPEG, JPG or PNG.

Do's

- Center the food on the picture.
- Upload squared images, meaning that height and width are the same.

Dont's

- Blurry images.
- Images that include multiple food items.

file:///C:/Users/harin/Desktop/FrontEnd/display.html

Fruit: ORANGE

Nutrition: 60 calories, No fat or sodium, 3 grams of fiber, 12 grams of sugar, 1 gram of protein, 14 micrograms of vitamin A, 70 milligrams of vitamin C, 6% of your daily recommended amount of calcium.