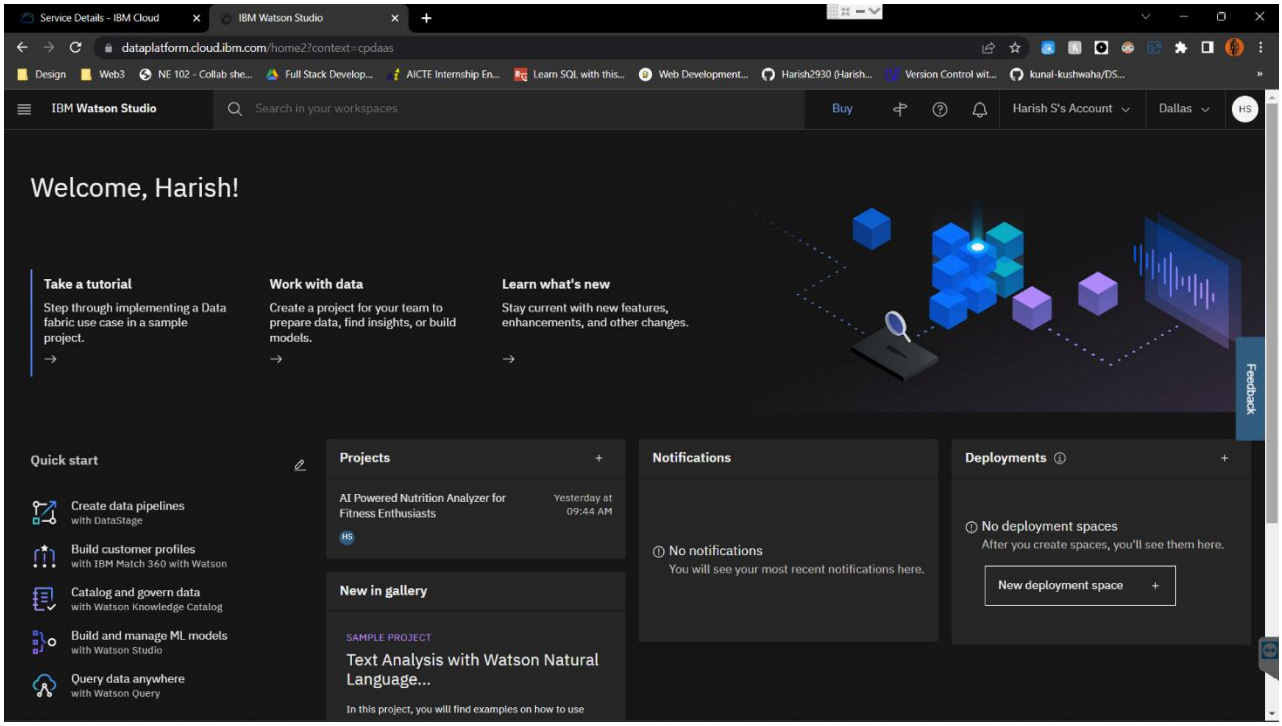
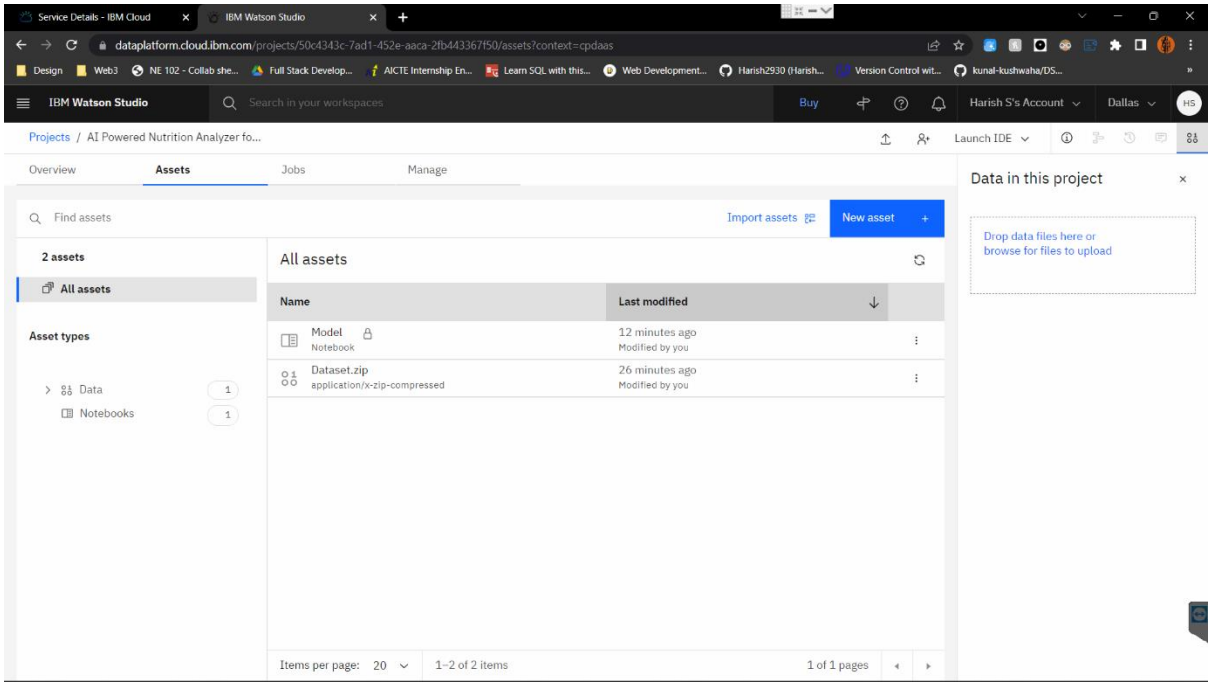
Train Model On IBM

TEAM ID: PNT2022TMID17050

PROJECT NAME: AI-powered Nutrition Analyzer for Fitness Enthusiasts

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application/x-zip-compressed
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1 of 1 pages
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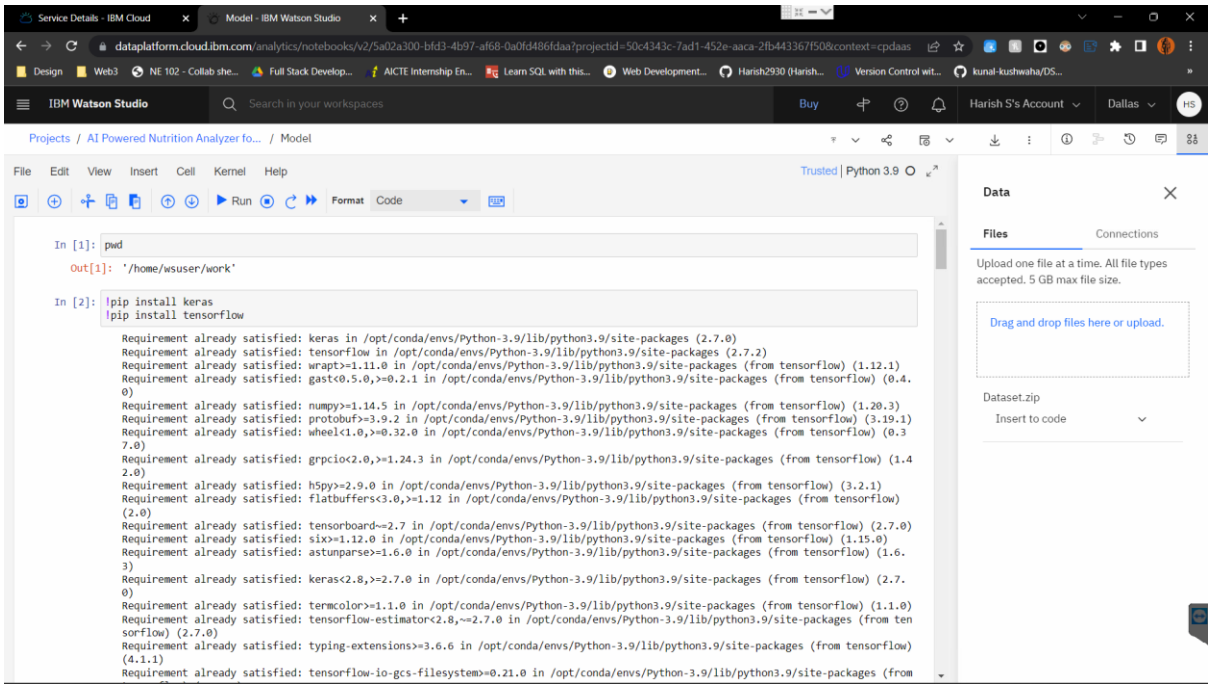
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Run
Format Code
In [1]: pwd
Out[1]: '/home/wsuser/work'
In [2]: !pip install keras
!pip install tensorflow
Requirement already satisfied: keras in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.0)
Requirement already satisfied: tensorflow in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.2)
Requirement already satisfied: wrapt>=1.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.12.1)
Requirement already satisfied: gast<0.5.0,>=0.2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.4.0)
Requirement already satisfied: numpy>=1.14.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.20.3)
Requirement already satisfied: protobuf>=3.9.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.19.1)
Requirement already satisfied: wheel<1.0,>=0.32.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.37.0)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.42.0)
Requirement already satisfied: h5py>=2.9.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.2.1)
Requirement already satisfied: flatbuffers<3.0,>=1.12 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.0)
Requirement already satisfied: tensorboard~=2.7 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: six>=1.12.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.15.0)
Requirement already satisfied: astunparse>=1.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.6.3)
Requirement already satisfied: keras<2.8,>=2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: termcolor>=1.1.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.1.0)
Requirement already satisfied: tensorflow-estimator<2.8,~=2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: typing-extensions>=3.6.6 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (4.1.1)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.21.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from
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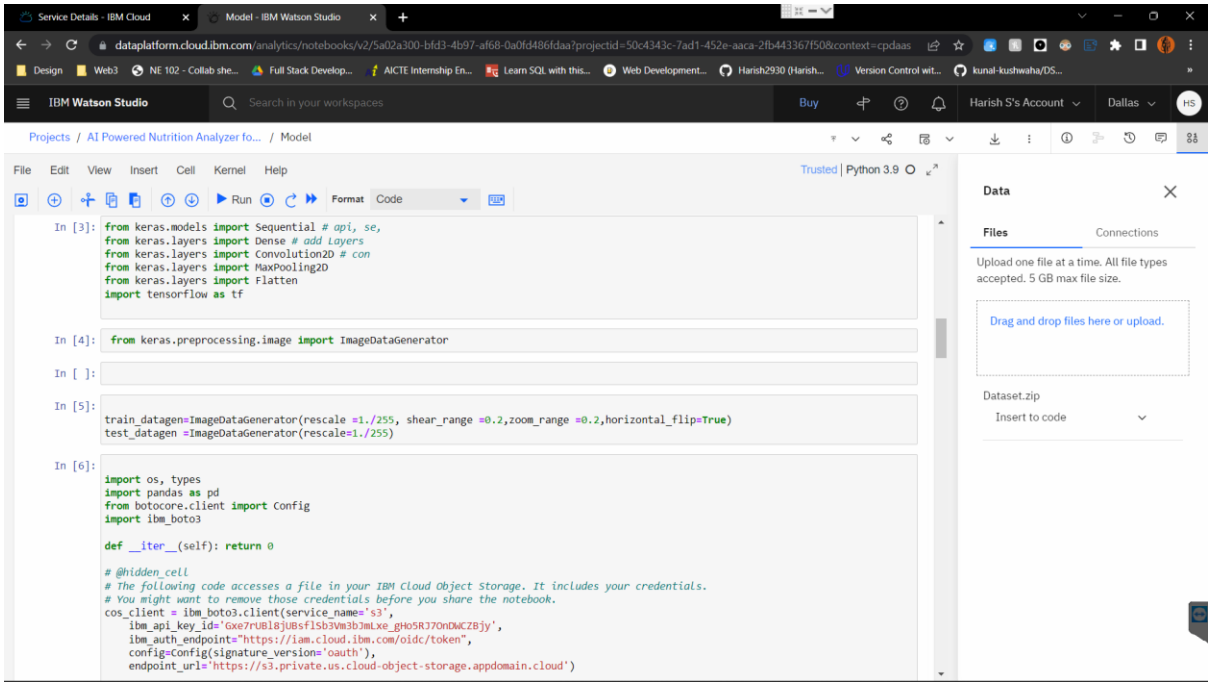
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In [3]:
from keras.models import Sequential # api, se,
from keras.layers import Dense # add Layers
from keras.layers import Convolution2D # con
from keras.layers import MaxPooling2D
from keras.layers import Flatten
import tensorflow as tf
In [4]:
from keras.preprocessing.image import ImageDataGenerator
In [ ]:
In [5]:
train_datagen=ImageDataGenerator(rescale =1./255, shear_range =0.2,zoom_range =0.2,horizontal_flip=True)
test_datagen =ImageDataGenerator(rescale=1./255)
In [6]:
import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3
def __iter__(self): return 0
# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.
cos_client = ibm_boto3.client(service_name='s3',
ibm_api_key_id='Gxe7rUBl8jUBsflSb3Vm3bJmLxe_gHo5RJ7OnDWCZBjy',
ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
config=Config(signature_version='oauth'),
endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')
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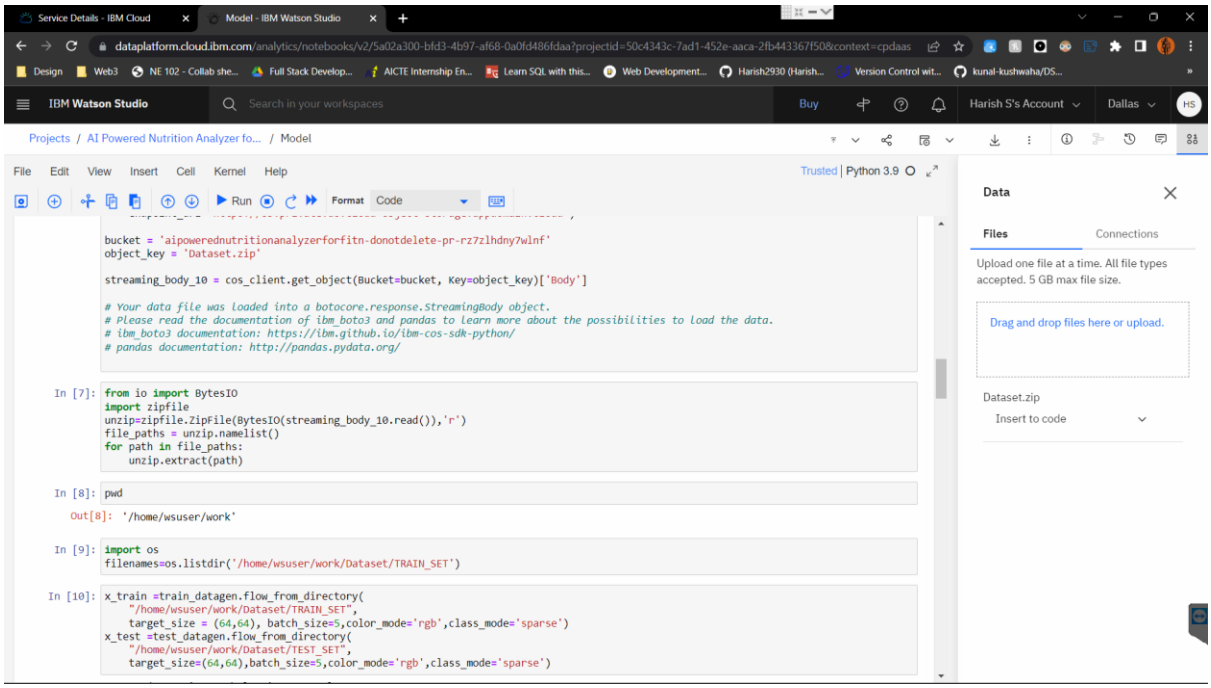
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bucket = 'aipoweredtnutritionanalyzerforfitn-donotdelete-pr-rz7zlhdny7wlnf'
object_key = 'Dataset.zip'
streaming_body_10 = cos_client.get_object(Bucket=bucket, Key=object_key)['Body']
# Your data file was loaded into a botocore.response.StreamingBody object.
# Please read the documentation of ibm_boto3 and pandas to learn more about the possibilities to load the data.
# ibm_boto3 documentation: https://ibm.github.io/ibm-cos-sdk-python/
# pandas documentation: http://pandas.pydata.org/
In [7]:
from io import BytesIO
import zipfile
unzip=zipfile.ZipFile(BytesIO(streaming_body_10.read()),'r')
file_paths = unzip.namelist()
for path in file_paths:
unzip.extract(path)
In [8]:
pwd
Out[8]: '/home/wsuser/work'
In [9]:
import os
filenames=os.listdir('/home/wsuser/work/Dataset/TRAIN_SET')
In [10]:
x_train =train_datagen.flow_from_directory(
"/home/wsuser/work/Dataset/TRAIN_SET",
target_size = (64,64), batch_size=5,color_mode='rgb',class_mode='sparse')
x_test =test_datagen.flow_from_directory(
"/home/wsuser/work/Dataset/TEST_SET",
target_size=(64,64),batch_size=5,color_mode='rgb',class_mode='sparse')
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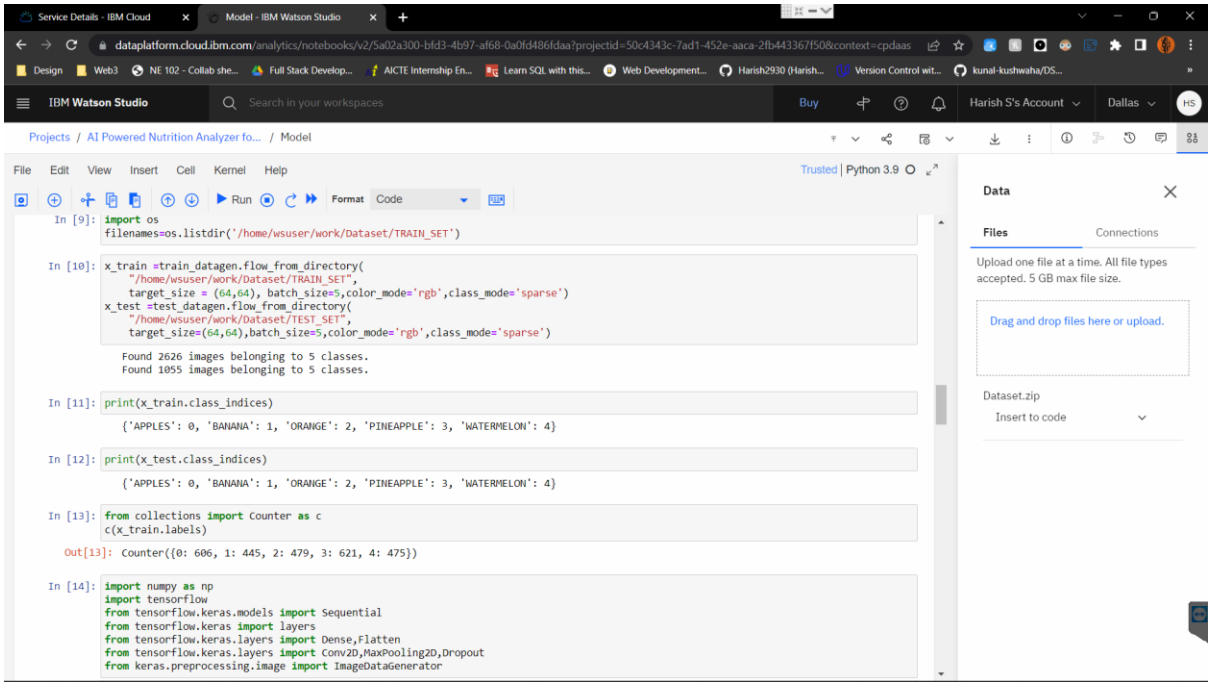
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In [9]:
import os
filenames=os.listdir('/home/wsuser/work/Dataset/TRAIN_SET')
In [10]:
x_train =train_datagen.flow_from_directory(
"/home/wsuser/work/Dataset/TRAIN_SET",
target_size = (64,64), batch_size=5,color_mode='rgb',class_mode='sparse')
x_test =test_datagen.flow_from_directory(
"/home/wsuser/work/Dataset/TEST_SET",
target_size=(64,64),batch_size=5,color_mode='rgb',class_mode='sparse')
Found 2626 images belonging to 5 classes.
Found 1055 images belonging to 5 classes.
In [11]:
print(x_train.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}
In [12]:
print(x_test.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}
In [13]:
from collections import Counter as c
c(x_train.labels)
Out[13]:
Counter({0: 606, 1: 445, 2: 479, 3: 621, 4: 475})
In [14]:
import numpy as np
import tensorflow
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
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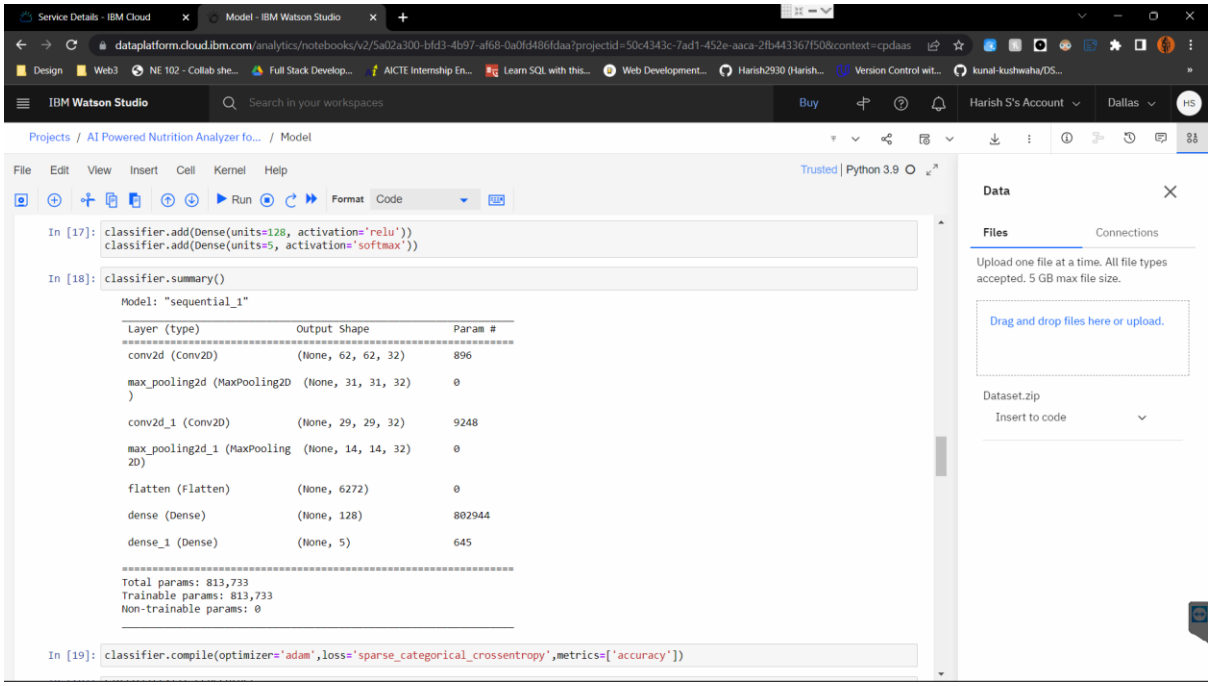
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In [17]:
classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))
In [18]:
classifier.summary()
Model: "sequential_1"
Layer (type) Output Shape Param #
conv2d (Conv2D) (None, 62, 62, 32) 896
max_pooling2d (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
In [19]:
classifier.compile(optimizer='adam',loss='sparse_categorical_crossentropy',metrics=['accuracy'])
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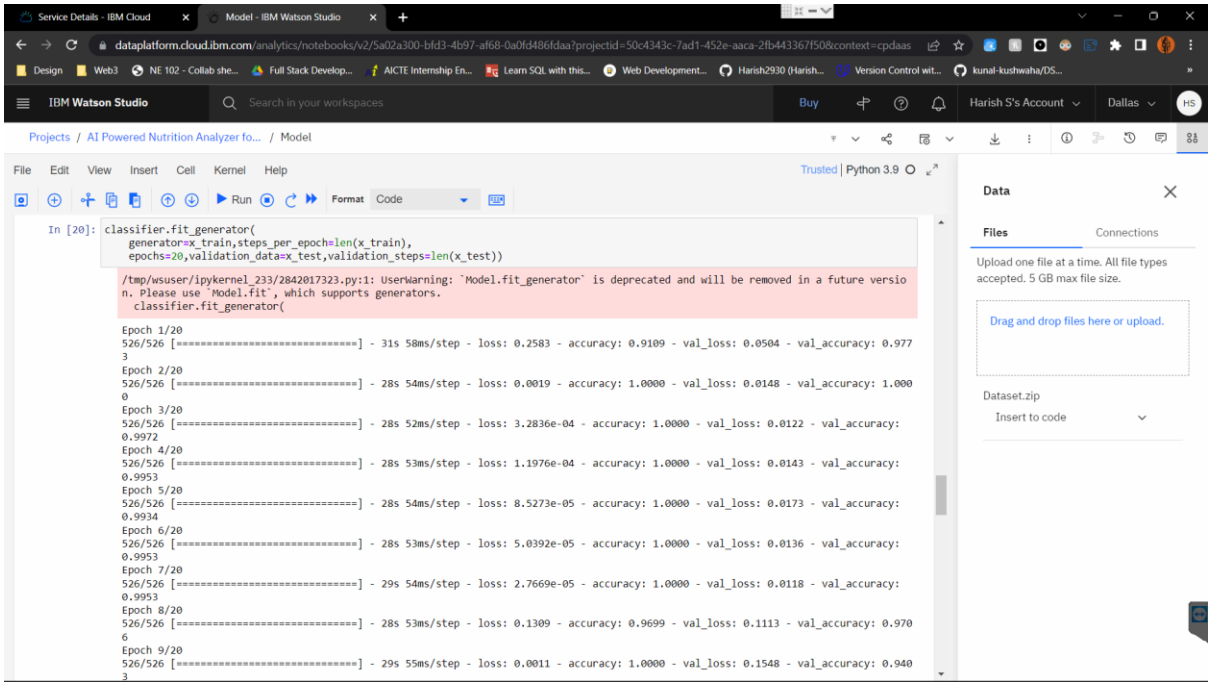
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In [20]:
classifier.fit_generator(
generator=x_train,steps_per_epoch=len(x_train),
epochs=20,validation_data=x_test,validation_steps=len(x_test))
/tmp/wsuser/ipykernel_233/2842017323.py:1: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future versio
n. Please use `Model.fit`, which supports generators.
classifier.fit_generator(
Epoch 1/20
526/526 [==============================] - 31s 58ms/step - loss: 0.2583 - accuracy: 0.9109 - val_loss: 0.0504 - val_accuracy: 0.977
3
Epoch 2/20
526/526 [==============================] - 28s 54ms/step - loss: 0.0019 - accuracy: 1.0000 - val_loss: 0.0148 - val_accuracy: 1.000
0
Epoch 3/20
526/526 [==============================] - 28s 52ms/step - loss: 3.2836e-04 - accuracy: 1.0000 - val_loss: 0.0122 - val_accuracy:
0.9972
Epoch 4/20
526/526 [==============================] - 28s 53ms/step - loss: 1.1976e-04 - accuracy: 1.0000 - val_loss: 0.0143 - val_accuracy:
0.9953
Epoch 5/20
526/526 [==============================] - 28s 54ms/step - loss: 8.5273e-05 - accuracy: 1.0000 - val_loss: 0.0173 - val_accuracy:
0.9934
Epoch 6/20
526/526 [==============================] - 28s 53ms/step - loss: 5.0392e-05 - accuracy: 1.0000 - val_loss: 0.0136 - val_accuracy:
0.9953
Epoch 7/20
526/526 [==============================] - 29s 54ms/step - loss: 2.7669e-05 - accuracy: 1.0000 - val_loss: 0.0118 - val_accuracy:
0.9953
Epoch 8/20
526/526 [==============================] - 28s 53ms/step - loss: 0.1309 - accuracy: 0.9699 - val_loss: 0.1113 - val_accuracy: 0.970
6
Epoch 9/20
526/526 [==============================] - 29s 55ms/step - loss: 0.0011 - accuracy: 1.0000 - val_loss: 0.1548 - val_accuracy: 0.940
3
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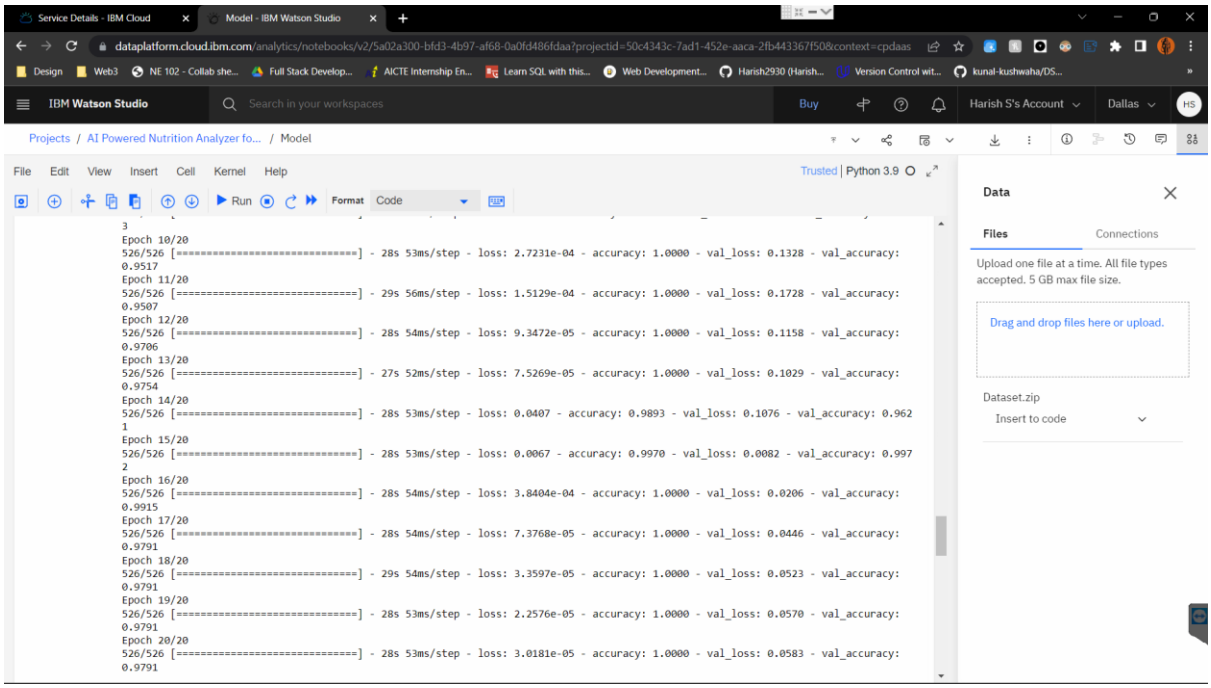
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Epoch 10/20
526/526 [==============================] - 28s 53ms/step - loss: 2.7231e-04 - accuracy: 1.0000 - val_loss: 0.1328 - val_accuracy:
0.9517
Epoch 11/20
526/526 [==============================] - 29s 56ms/step - loss: 1.5129e-04 - accuracy: 1.0000 - val_loss: 0.1728 - val_accuracy:
0.9507
Epoch 12/20
526/526 [==============================] - 28s 54ms/step - loss: 9.3472e-05 - accuracy: 1.0000 - val_loss: 0.1158 - val_accuracy:
0.9706
Epoch 13/20
526/526 [==============================] - 27s 52ms/step - loss: 7.5269e-05 - accuracy: 1.0000 - val_loss: 0.1029 - val_accuracy:
0.9754
Epoch 14/20
526/526 [==============================] - 28s 53ms/step - loss: 0.0407 - accuracy: 0.9893 - val_loss: 0.1076 - val_accuracy: 0.962
1
Epoch 15/20
526/526 [==============================] - 28s 53ms/step - loss: 0.0067 - accuracy: 0.9970 - val_loss: 0.0082 - val_accuracy: 0.997
2
Epoch 16/20
526/526 [==============================] - 28s 54ms/step - loss: 3.8404e-04 - accuracy: 1.0000 - val_loss: 0.0206 - val_accuracy:
0.9915
Epoch 17/20
526/526 [==============================] - 28s 54ms/step - loss: 7.3768e-05 - accuracy: 1.0000 - val_loss: 0.0446 - val_accuracy:
0.9791
Epoch 18/20
526/526 [==============================] - 29s 54ms/step - loss: 3.3597e-05 - accuracy: 1.0000 - val_loss: 0.0523 - val_accuracy:
0.9791
Epoch 19/20
526/526 [==============================] - 28s 53ms/step - loss: 2.2576e-05 - accuracy: 1.0000 - val_loss: 0.0570 - val_accuracy:
0.9791
Epoch 20/20
526/526 [==============================] - 28s 53ms/step - loss: 3.0181e-05 - accuracy: 1.0000 - val_loss: 0.0583 - val_accuracy:
0.9791
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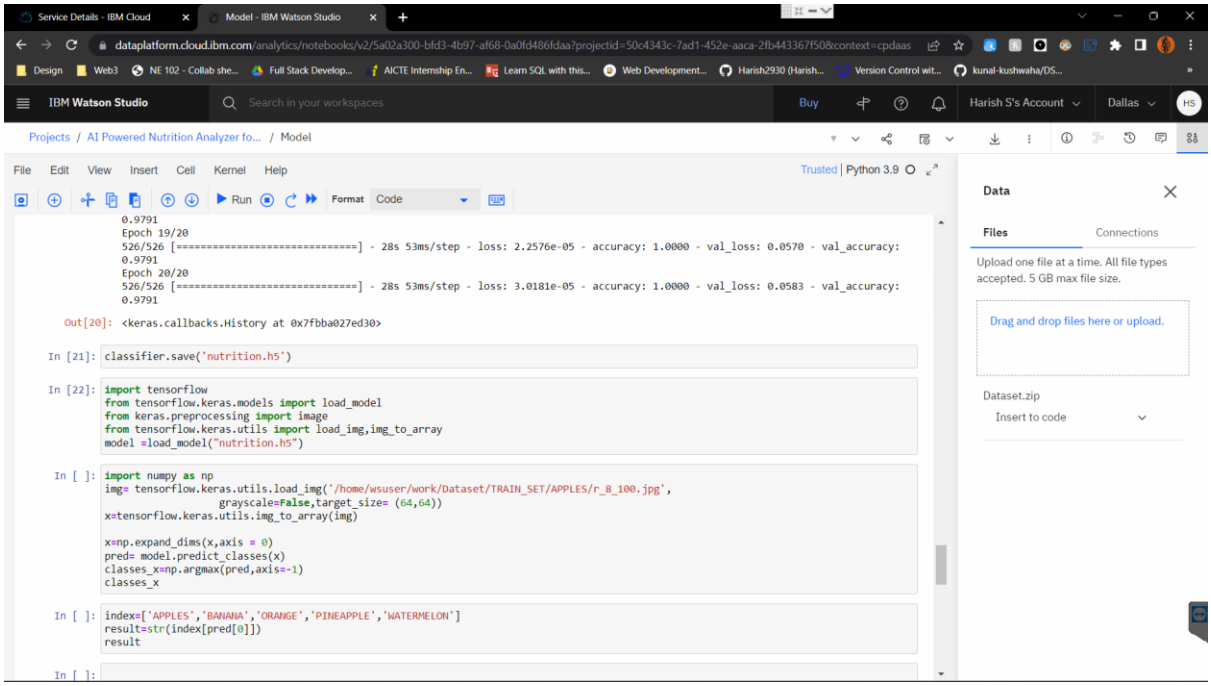
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0.9791
Epoch 19/20
526/526 [==========] - 28s 53ms/step - loss: 2.2576e-05 - accuracy: 1.0000 - val_loss: 0.0570 - val_accuracy:
0.9791
Epoch 20/20
526/526 [==========] - 28s 53ms/step - loss: 3.0181e-05 - accuracy: 1.0000 - val_loss: 0.0583 - val_accuracy:
0.9791
Out[20]: <keras.callbacks.History at 0x7fbba027ed30>
In [21]: classifier.save('nutrition.h5')
In [22]: import tensorflow
from tensorflow.keras.models import load_model
from keras.preprocessing import image
from tensorflow.keras.utils import load_img,img_to_array
model =load_model("nutrition.h5")
In [ ]: import numpy as np
img= tensorflow.keras.utils.load_img('/home/wsuser/work/Dataset/TRAIN_SET/APPLES/r_8_100.jpg',
grayscale=False,target_size= (64,64))
x=tensorflow.keras.utils.img_to_array(img)
x=np.expand_dims(x,axis = 0)
pred= model.predict_classes(x)
classes_x=np.argmax(pred,axis=-1)
classes_x
In [ ]: index=['APPLES','BANANA','ORANGE','PINEAPPLE','WATERMELON']
result=str(index[pred[0]])
result
In [ ]:
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