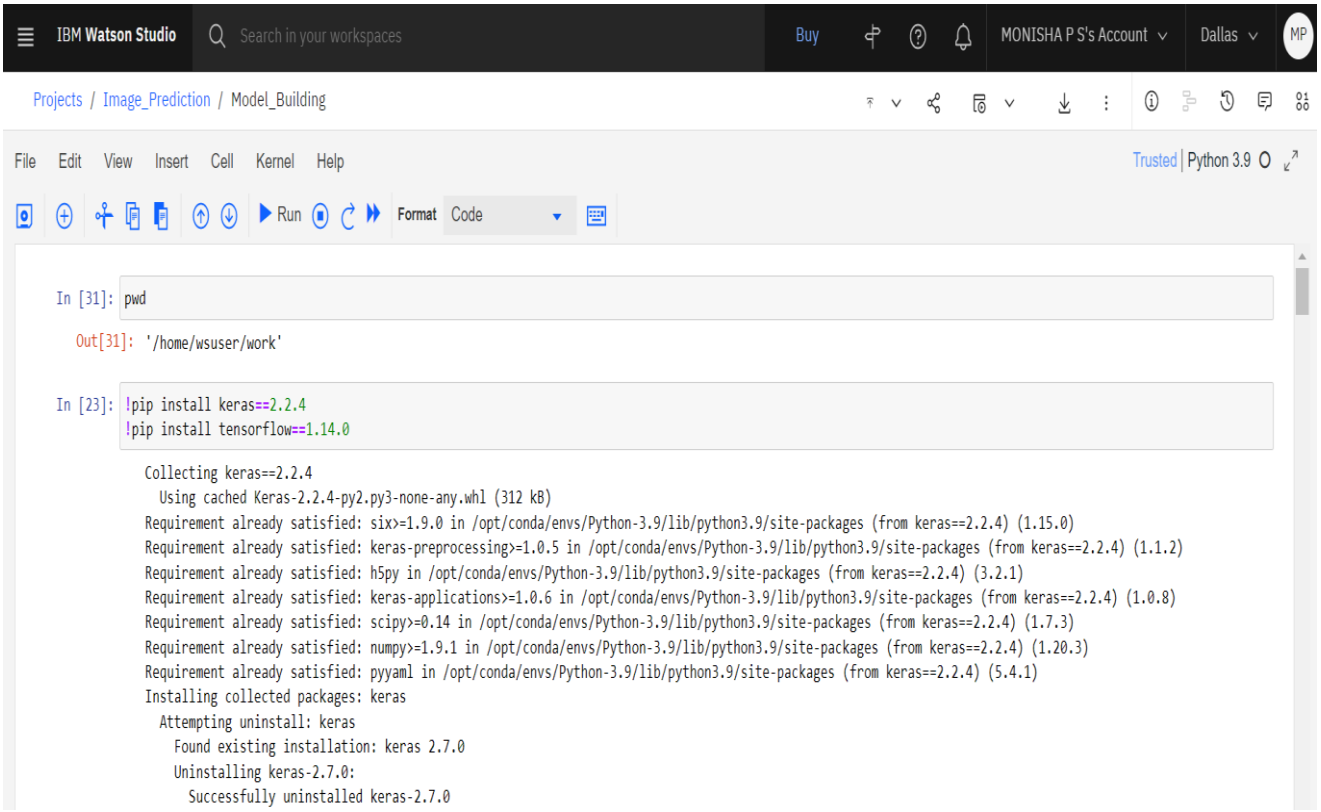
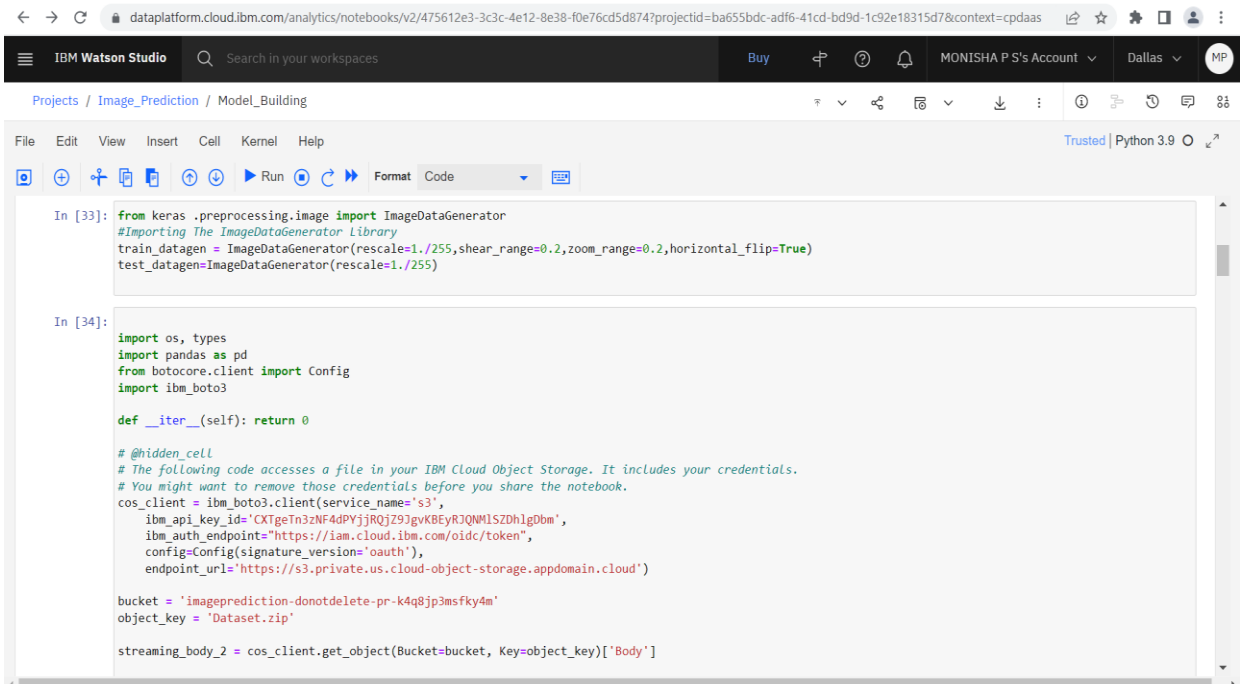
Sprint-4

Deployment – IBM Cloud

Date	11 November 2022
Team ID	PNT2022TMID30252
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts
Maximum Marks	

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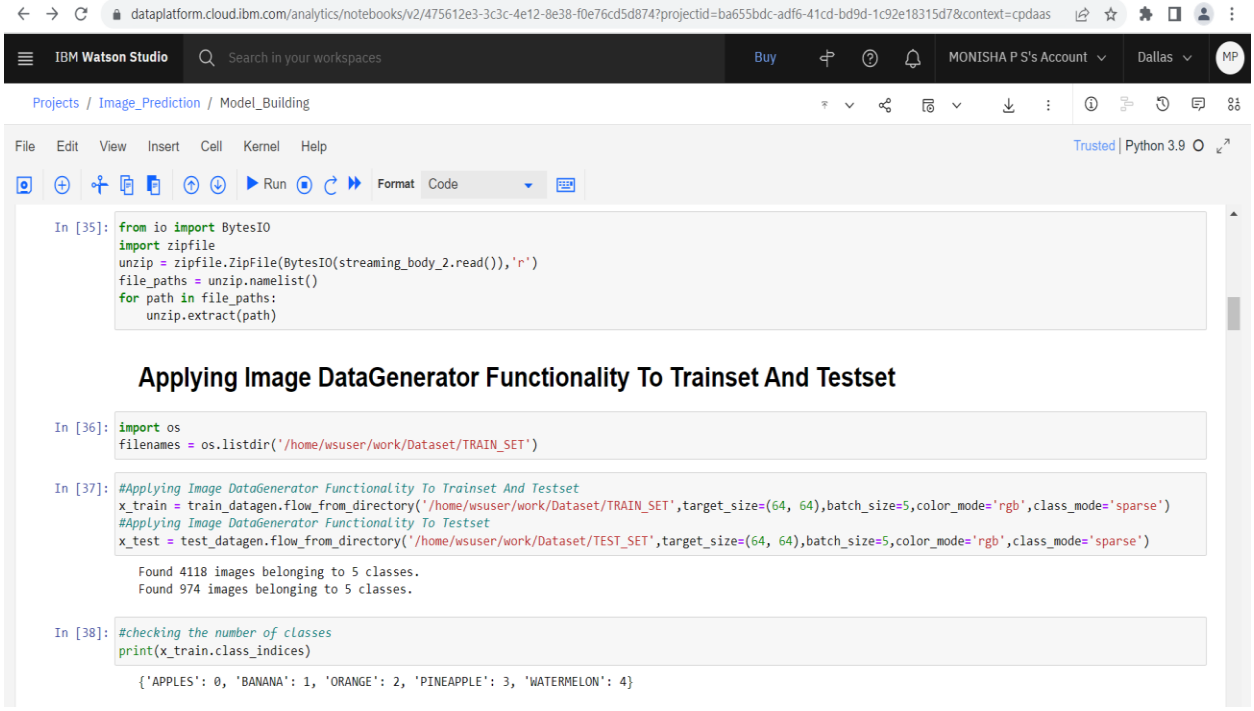
In [33]:
from keras .preprocessing.image import ImageDataGenerator
#Importing The ImageDataGenerator Library
train_datagen = ImageDataGenerator(rescale=1./255,shear_range=0.2,zoom_range=0.2,horizontal_flip=True)
test_datagen=ImageDataGenerator(rescale=1./255)
In [34]:
import os, types
import pandas as 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='CXTgeTn3zNF4dPYjjRQjZ9JgvKBEyRJQNMlSZDhlgDbm',
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')
bucket = 'imageprediction-donotdelete-pr-k4q8jp3msfky4m'
object_key = 'Dataset.zip'
streaming_body_2 = cos_client.get_object(Bucket=bucket, Key=object_key)['Body']


dataplatform.cloud.ibm.com/analytics/notebooks/v2/475612e3-3c3c-4e12-8e38-f0e76cd5d874?projectid=ba655bdc-adf6-41cd-bd9d-1c92e18315d7&context=cpdaas
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In [35]:
from io import BytesIO
import zipfile
unzip = zipfile.ZipFile(BytesIO(streaming_body_2.read()),'r')
file_paths = unzip.namelist()
for path in file_paths:
unzip.extract(path)
Applying Image DataGenerator Functionality To Trainset And Testset
In [36]:
import os
filenames = os.listdir('/home/wsuser/work/Dataset/TRAIN_SET')
In [37]:
#Applying Image DataGenerator Functionality To Trainset And Testset
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')
#Applying Image DataGenerator Functionality To Testset
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 4118 images belonging to 5 classes.
Found 974 images belonging to 5 classes.
In [38]:
#checking the number of classes
print(x_train.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

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3. Adding CNN Layers

In [44]:
```
# Initializing the CNN
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())
```

4. Adding Dense Layers

In [45]:
```
classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))
```

In [46]:
```
#summary of our model
classifier.summary()
```

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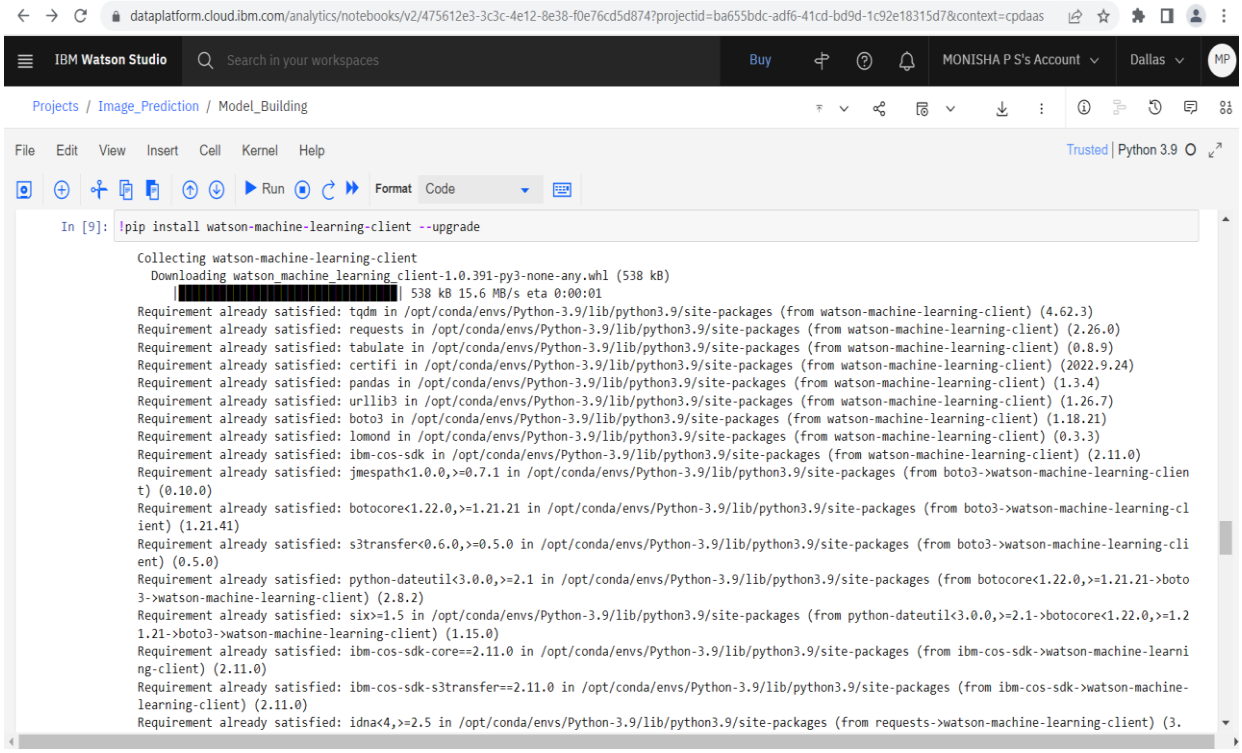
In [48]:
```
#Fitting the model
classifier.fit_generator(generator=x_train,steps_per_epoch = len(x_train),epochs=20, validation_data=x_test,validation_steps = len(x_test))
```

```
/opt/conda/envs/Python-3.9/lib/python3.9/site-packages/tensorflow/python/keras/engine/training.py:1963: UserWarning: `Model.fit_generator` is deprecated a
nd will be removed in a future version. Please use `Model.fit`, which supports generators.
  warnings.warn('`Model.fit_generator` is deprecated and '

Epoch 1/20
824/824 [==============================] - 46s 55ms/step - loss: 0.6441 - accuracy: 0.7499 - val_loss: 0.8608 - val_accuracy: 0.7680
Epoch 2/20
824/824 [==============================] - 44s 54ms/step - loss: 0.4224 - accuracy: 0.8424 - val_loss: 0.8503 - val_accuracy: 0.7885
Epoch 3/20
824/824 [==============================] - 45s 55ms/step - loss: 0.3932 - accuracy: 0.8533 - val_loss: 0.8375 - val_accuracy: 0.7885
Epoch 4/20
824/824 [==============================] - 45s 54ms/step - loss: 0.3654 - accuracy: 0.8633 - val_loss: 0.8503 - val_accuracy: 0.8070
Epoch 5/20
824/824 [==============================] - 45s 54ms/step - loss: 0.3457 - accuracy: 0.8701 - val_loss: 0.9432 - val_accuracy: 0.8060
Epoch 6/20
824/824 [==============================] - 45s 54ms/step - loss: 0.3245 - accuracy: 0.8781 - val_loss: 1.0438 - val_accuracy: 0.8193
Epoch 7/20
824/824 [==============================] - 45s 54ms/step - loss: 0.2980 - accuracy: 0.8868 - val_loss: 1.1174 - val_accuracy: 0.7967
Epoch 8/20
824/824 [==============================] - 44s 54ms/step - loss: 0.2961 - accuracy: 0.8871 - val_loss: 1.2373 - val_accuracy: 0.8060
Epoch 9/20
824/824 [==============================] - 45s 54ms/step - loss: 0.2749 - accuracy: 0.8915 - val_loss: 1.1145 - val_accuracy: 0.8101
Epoch 10/20
824/824 [==============================] - 45s 54ms/step - loss: 0.2518 - accuracy: 0.9070 - val_loss: 1.2814 - val_accuracy: 0.8306
Epoch 11/20
824/824 [==============================] - 45s 54ms/step - loss: 0.2436 - accuracy: 0.9070 - val_loss: 1.2271 - val_accuracy: 0.8378
```


dataplatform.cloud.ibm.com/analytics/notebooks/v2/475612e3-3c3c-4e12-8e38-f0e76cd5d874?projectid=ba655bdc-adf6-41cd-bd9d-1c92e18315d7&context=cpdaas
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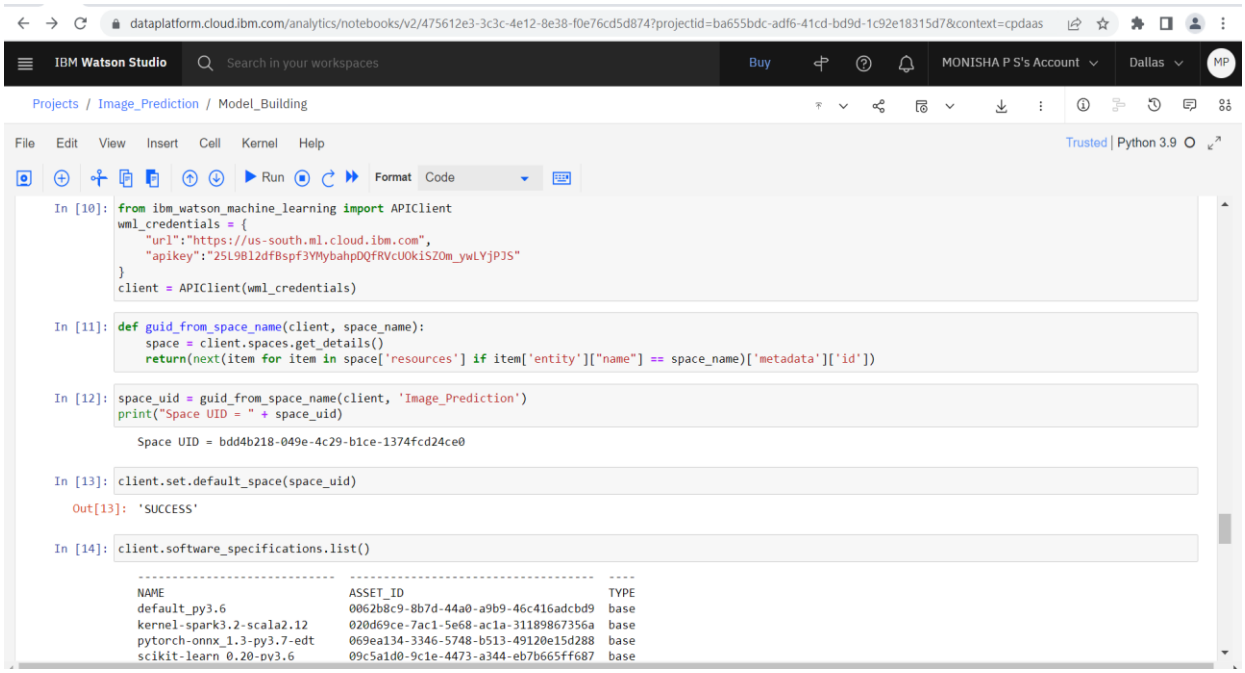
In [9]: !pip install watson-machine-learning-client --upgrade
Collecting watson-machine-learning-client
Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)
538 kB 15.6 MB/s eta 0:00:01
Requirement already satisfied: tqdm in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (4.62.3)
Requirement already satisfied: requests in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2.26.0)
Requirement already satisfied: tabulate in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (0.8.9)
Requirement already satisfied: certifi in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2022.9.24)
Requirement already satisfied: pandas in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.3.4)
Requirement already satisfied: urllib3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.26.7)
Requirement already satisfied: boto3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.18.21)
Requirement already satisfied: lomond in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (0.3.3)
Requirement already satisfied: ibm-cos-sdk in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2.11.0)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (0.10.0)
Requirement already satisfied: botocore<1.22.0,>=1.21.21 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (1.21.41)
Requirement already satisfied: s3transfer<0.6.0,>=0.5.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (0.5.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (2.8.2)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (1.15.0)
Requirement already satisfied: ibm-cos-sdk-core==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: ibm-cos-sdk-s3transfer==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->watson-machine-learning-client) (3.


dataplatform.cloud.ibm.com/analytics/notebooks/v2/475612e3-3c3c-4e12-8e38-f0e76cd5d874?projectid=ba655bdc-adf6-41cd-bd9d-1c92e18315d7&context=cpdaas
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In [10]: from ibm_watson_machine_learning import APIClient
wml_credentials = {
"url":"https://us-south.ml.cloud.ibm.com",
"apikey":"25L9B12dfBspf3YMybahpDQfRVcUOkiSZOm_ywLYjPJS"
}
client = APIClient(wml_credentials)
In [11]: def guid_from_space_name(client, space_name):
space = client.spaces.get_details()
return(next(item for item in space['resources'] if item['entity']["name"] == space_name)['metadata']['id'])
In [12]: space_uid = guid_from_space_name(client, 'Image_Prediction')
print("Space UID = " + space_uid)
Space UID = bdd4b218-049e-4c29-b1ce-1374fcd24ce0
In [13]: client.set.default_space(space_uid)
Out[13]: 'SUCCESS'
In [14]: client.software_specifications.list()
NAME ASSET_ID TYPE
default_py3.6 0062b8c9-8b7d-44a0-a9b9-46c416adcbd9 base
kernel-spark3.2-scala2.12 020d69ce-7ac1-5e68-ac1a-31189867356a base
pytorch-onnx_1.3-py3.7-edt 069ea134-3346-5748-b513-49120e15d288 base
scikit-learn_0.20-py3.6 09c5a1d0-9c1e-4473-a344-eb7b665ff687 base