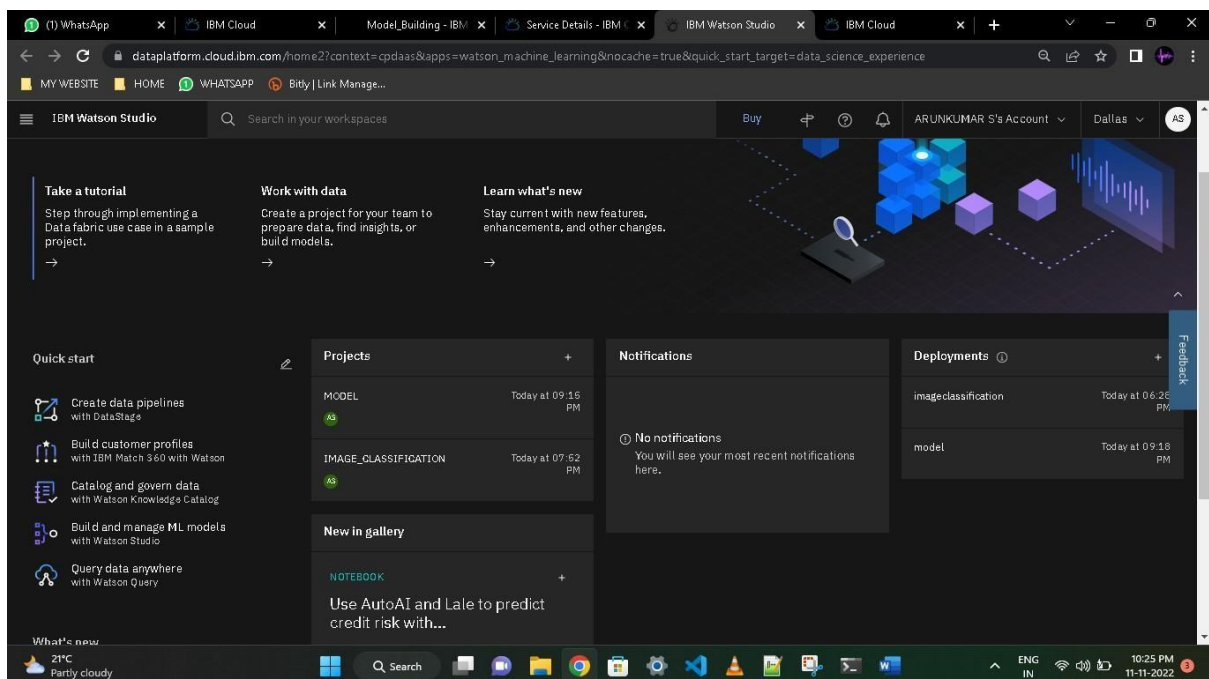


Train Model On IBM

TEAM ID : PNT2022TMID16460

PROJECT NAME : AI-powered Nutrition Analyzer for Fitness Enthusiasts



IBM Cloud

cloud.ibm.com/services/pm-20/cm%3Av1%3Abluemix%3Apublic%3Apm-20%3Aus-south%3Aa%2Fe877a29349614c2a84759a1df2cc02be%3Aef063387-dfba-4d59-a04...

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Launch in IBM Cloud Pak for Data

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IBM Watson Machine Learning is part of IBM Cloud Pak for Data and serves as the data science capability of the data fabric architecture.

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Projects / IMAGE_CLASSIFICATION Launch IDE

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Notebooks

Name	Language	Last modified
Model_Building Notebook	Python 3.9	42 minutes ago Modified by you

Items per page: 20 1-1 of 1 items 1 of 1 pages

About this project

Name IMAGE_CLASSIFICATION

Description What's the purpose of this project?

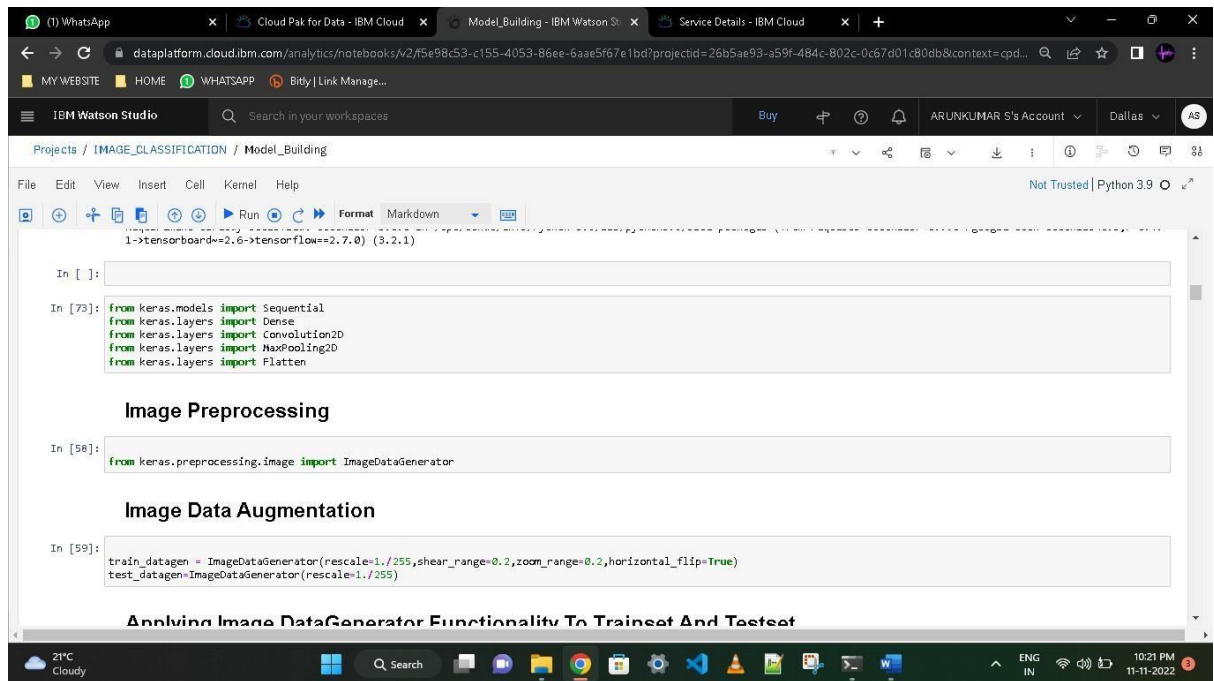
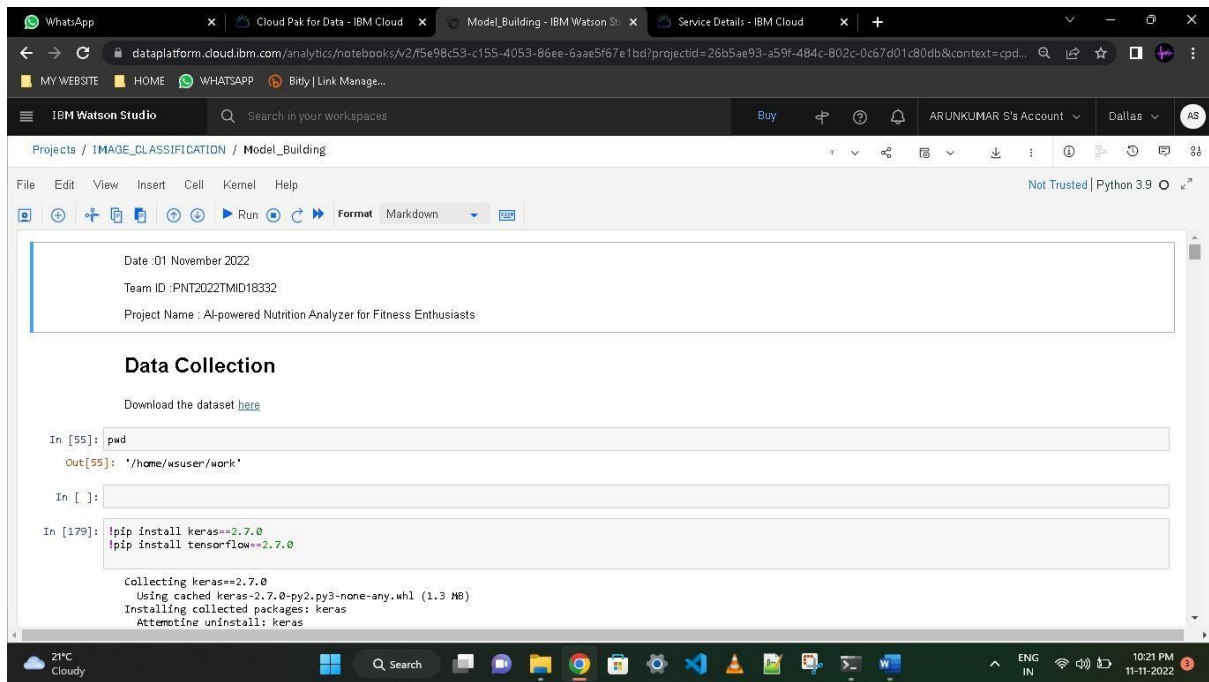
Collaborators ARUNKUMAR S (you) Admin

Controls

Cloud object storage 89.2 MB used

IBM Cloud account Name: ARUNKUMAR S's Account ID: e877a29349614c2a84759a1df2cc02

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IBM Watson Studio interface showing a Jupyter Notebook titled "Applying Image DataGenerator Functionality To Trainset And Testset". The notebook is running Python 3.9 and is in the "Model_Building" project under the "IMAGE_CLASSIFICATION" workspace.

The notebook content includes the following code:

```
test_datagen=ImageDataGenerator(rescale=1./255)

In [60]:
import os, types
import pandas as pd
from boto3.client import Config
import 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 = boto3.client(service_name='s3',
    aws_access_key_id='Gau27L_S7syPxtIQiss3Az5E16m9cNj532640UOYD2H1',
    aws_secret_access_key='https://iam.cloud.ibm.com/oidc/token',
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')

bucket = 'imageclassification-donotdelete-pr-v1604oqevxyin'
object_key = 'Dataset.zip'

streaming_body_8 = cos_client.get_object(Bucket=bucket, Key=object_key)['Body']

# Your data file was loaded into a boto3.client.StreamingBody object.
```

The notebook output shows the following steps:

- Uninstalling keras, keras-nightly, keras-Preprocessing, keras-vis, tensorflow, and h5py.
- Installing keras 2.7.0, keras-Preprocessing 1.1.2, and tensorflow 2.7.0.
- Uninstalling tensorflow 2.7.0 and installing tensorflow 2.7.0.
- Uninstalling tensorflow 2.7.0 and installing tensorflow 2.7.0.

The right sidebar shows the "Data" panel with a "Files" tab. It indicates that one file at a time can be uploaded, with a maximum file size of 5 GB. The "Dataset.zip" file is listed, and the "Insert to code" button is visible.

IBM Watson Studio interface showing a Jupyter Notebook session. The notebook is titled "Model_Building" and is part of a project named "IMAGE_CLASSIFICATION". The code in the notebook is:

```
In [69]: !pip install keras==2.0.8
!pip install h5py==2.10.0

Collecting keras==2.0.8
  Downloading keras-2.0.8-py3-none-any.whl (276 kB)
    Requirement already satisfied: numpy>=1.9.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.0.8) (1.20.3)
    Requirement already satisfied: pyyaml in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.0.8) (5.4.1)
    Requirement already satisfied: scipy>=0.14 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.0.8) (1.7.3)
    Requirement already satisfied: six>=1.9.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.0.8) (1.15.0)
Installing collected packages: keras
Successfully installed keras-2.0.8
Collecting h5py==2.10.0
  Downloading h5py-2.10.0.tar.gz (301 kB)
    Requirement already satisfied: numpy>=1.7 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from h5py==2.10.0) (1.20.3)
    Requirement already satisfied: six in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from h5py==2.10.0) (1.15.0)
Building wheels for collected packages: h5py
  Building wheel for h5py (setup.py) ... done
  Created wheel for h5py: filename=h5py-2.10.0-cp39-cp39-linux_x86_64.whl size=1298125 sha256=d5165b1d61c7f8750fe235eb9603b11b9a567cc95ad905c7693b880f647e0420
  Stored in directory: /tmp/bsuser/.cache/pip/wheels/91/57/54/aa5901c840e9c1e931141d848b27421f68ad9ebd285cc4036
Successfully built h5py
Installing collected packages: h5py
Successfully installed h5py-2.10.0
```

IBM Watson Studio interface showing a Jupyter Notebook session. The notebook is titled "Model_Building" and is part of a project named "IMAGE_CLASSIFICATION". The code in the notebook is:

```
In [70]: 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 4118 images belonging to 5 classes.
Found 929 images belonging to 5 classes.

In [ ]:

In [71]: print(x_train.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

In [ ]: print(x_test.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

In [ ]: from collections import Counter as c
c(x_train.labels)
```


IBM Watson Studio interface showing a Jupyter Notebook titled "Model Building". The notebook is in the "Model_Building" project under the "IMAGE_CLASSIFICATION" workspace. The code in the notebook is as follows:

```
In [75]: 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
```

The code execution resulted in a `ModuleNotFoundError` with the following traceback:

```
ModuleNotFoundError: Traceback (most recent call last)
/tmp/ksuser/ipykernel_165/3963299783.py in <module>
      1 import numpy as np
      2 import tensorflow as tf
----> 3 from tensorflow.keras.models import Sequential
      4 from tensorflow.keras import layers
      5 from tensorflow.keras.layers import Dense, Flatten

ModuleNotFoundError: No module named 'tensorflow.keras'
```

The right sidebar shows the "Data" panel with a "Files" tab. It indicates that one file can be uploaded at a time, with a maximum file size of 5 GB. A "Dataset.zip" file is listed, and an "Insert to code" button is available.

IBM Watson Studio interface showing the continuation of the Jupyter Notebook "Model Building". The notebook is in the "Model_Building" project under the "IMAGE_CLASSIFICATION" workspace. The code in the notebook is as follows:

```
In [78]: model = Sequential()
```

The code execution resulted in a `ValueError` with the following traceback:

```
ValueError: 2022-11-11 11:55:55.729213: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'lib
cuda.so.1'; dlderror: libcuda.so.1: cannot open shared object file: No such file or directory; LD_LIBRARY_PATH: /opt/ibm/dsdrive
r/lib:/opt/oracle/lib:/opt/conda/envs/Python-3.9/lib/python3.9/site-packages/tensorflow
2022-11-11 11:55:55.729279: W tensorflow/stream_executor/cuda/cuda_driver.cc:263] failed call to cuInit: UNKNOWN ERROR (383)
```

The right sidebar shows the "Data" panel with a "Files" tab. It indicates that one file can be uploaded at a time, with a maximum file size of 5 GB. A "Dataset.zip" file is listed, and an "Insert to code" button is available.

IBM Watson Studio interface showing a Jupyter Notebook titled "4. Adding Dense Layers". The notebook contains the following code:

```
In [80]: classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))

In [ ]:

In [81]: classifier.summary()
```

The output of the `summary()` method is displayed as a table:

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 (MaxPooling2D)	(None, 14, 14, 32)	0
flatten (Flatten)	(None, 6272)	0
dense (Dense)	(None, 128)	802944

The right sidebar shows the "Data" panel with "Files" and "Connections" tabs. The "Files" tab is active, showing a message: "Upload one file at a time. All file types accepted. 5 GB max file size." and a button "Drag and drop files here or upload.".

IBM Watson Studio interface showing the same Jupyter Notebook, now displaying the output of a training process. The output shows the progress of training over 12 epochs, including loss and accuracy metrics.

```
Epoch 1/20
824/824 [=====] - 51s 62ms/step - loss: 0.4291 - accuracy: 0.8407 - val_loss: 0.4409 - val_accuracy: 0.8202
Epoch 2/20
824/824 [=====] - 48s 53ms/step - loss: 0.3797 - accuracy: 0.8565 - val_loss: 0.5238 - val_accuracy: 0.8073
Epoch 3/20
824/824 [=====] - 49s 59ms/step - loss: 0.3626 - accuracy: 0.8621 - val_loss: 0.4525 - val_accuracy: 0.8052
Epoch 4/20
824/824 [=====] - 48s 58ms/step - loss: 0.3440 - accuracy: 0.8691 - val_loss: 0.4087 - val_accuracy: 0.8450
Epoch 5/20
824/824 [=====] - 48s 58ms/step - loss: 0.3269 - accuracy: 0.8820 - val_loss: 0.4273 - val_accuracy: 0.8418
Epoch 6/20
824/824 [=====] - 47s 57ms/step - loss: 0.3166 - accuracy: 0.8871 - val_loss: 0.5578 - val_accuracy: 0.7578
Epoch 7/20
824/824 [=====] - 46s 56ms/step - loss: 0.2916 - accuracy: 0.8898 - val_loss: 0.4375 - val_accuracy: 0.8579
Epoch 8/20
824/824 [=====] - 48s 58ms/step - loss: 0.2822 - accuracy: 0.8963 - val_loss: 0.4105 - val_accuracy: 0.8525
Epoch 9/20
824/824 [=====] - 46s 56ms/step - loss: 0.2595 - accuracy: 0.8995 - val_loss: 0.4174 - val_accuracy: 0.8547
Epoch 10/20
824/824 [=====] - 45s 54ms/step - loss: 0.2508 - accuracy: 0.9034 - val_loss: 0.4238 - val_accuracy: 0.8579
```

The right sidebar shows the "Data" panel with "Files" and "Connections" tabs. The "Files" tab is active, showing a message: "Upload one file at a time. All file types accepted. 5 GB max file size." and a button "Drag and drop files here or upload.".

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Projects / IMAGE_CLASSIFICATION / Model_Building

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In [82]:

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

In [83]:

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

Epoch 1/20

/tmp/wsuser/ipykernel_165/727910627.py:1: UserWarning: 'Model.fit_generator' is deprecated and will be removed in a future version. Please use 'Model.fit', which supports generators.
classifier.fit_generator(generator=x_train, steps_per_epoch = len(x_train), epochs=20, validation_data=x_test, validation_steps = len(x_test))
WARNING:tensorflow:AutoGraph could not transform <function Model.make_train_function.<locals>.train_function at 0x7f06d4f7cdc0> and will run it as-is.
Please report this to the TensorFlow team. When filing the bug, set the verbosity to 10 (on Linux, 'export AUTOGRAPH_VERBOSITY=10') and attach the full output.
Cause: closure mismatch, requested ('self', 'step_function'), but source function had ()
To silence this warning, decorate the function with @tf.autograph.experimental.do_not_convert
WARNING: AutoGraph could not transform <function Model.make_train_function.<locals>.train_function at 0x7f06d4f7cdc0> and will run it as-is.

Data

FilesConnections

Upload one file at a time. All file types accepted. 5 GB max file size.

Drag and drop files here or upload.

Dataset.zip

Insert to code

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Data assets1

Notebooks1

Data assets

Name	Last modified
Dataset.zip application/x-zip-compressed	6 hours ago Modified by you

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About this project

Name

IMAGE_CLASSIFICATION

Description

What's the purpose of this project?

Collaborators

ARUNKUMAR S (you)
Admin

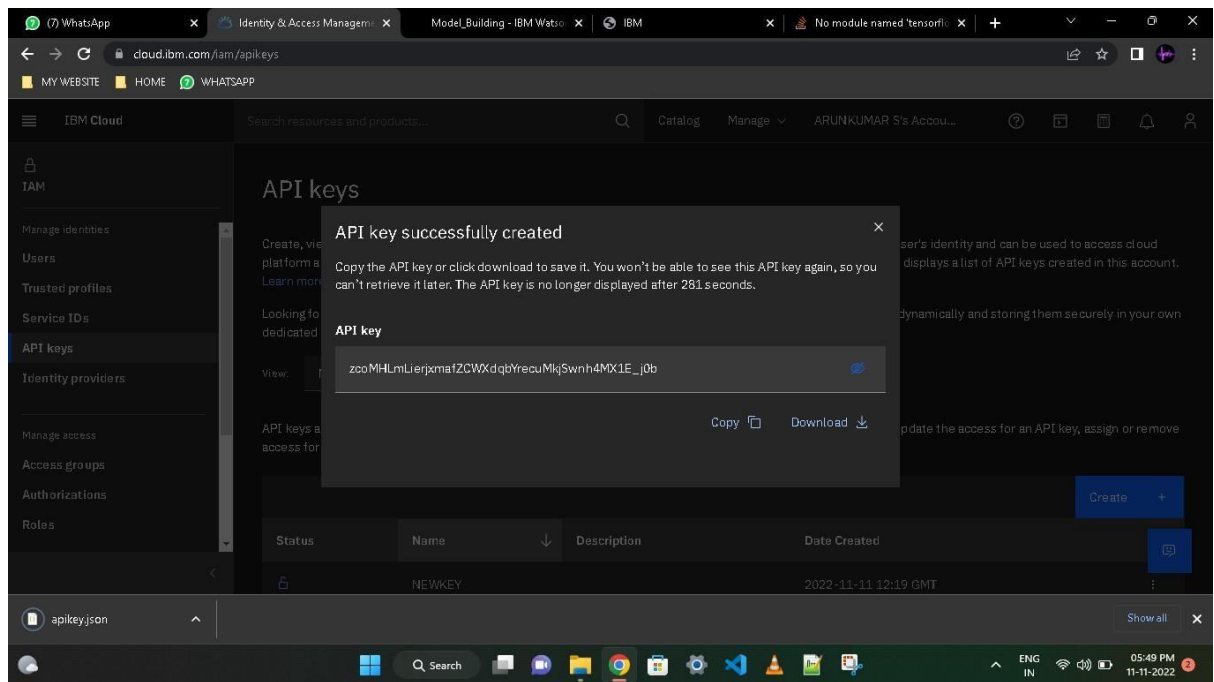
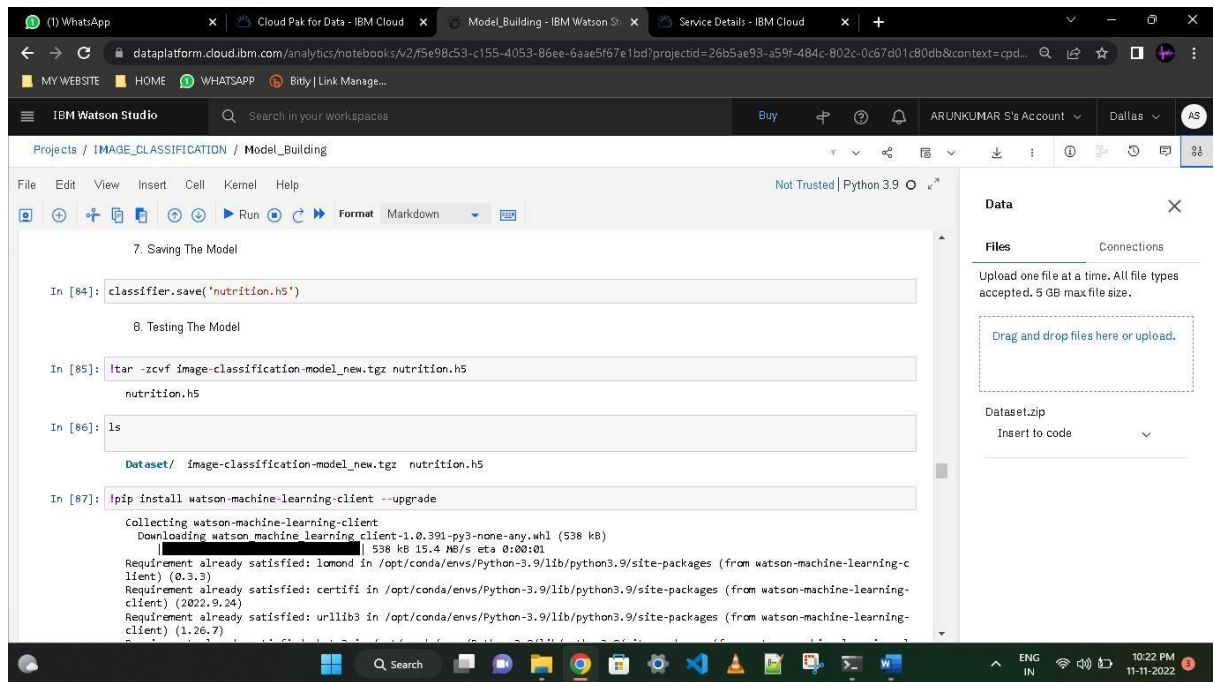
Controls

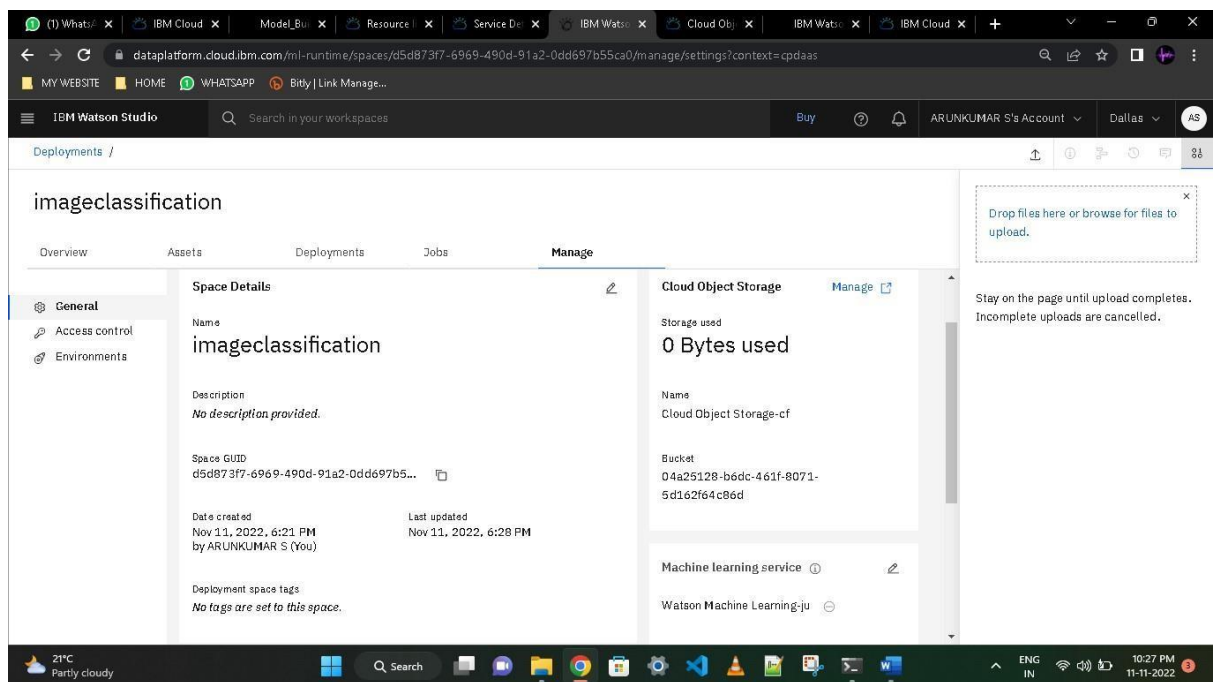
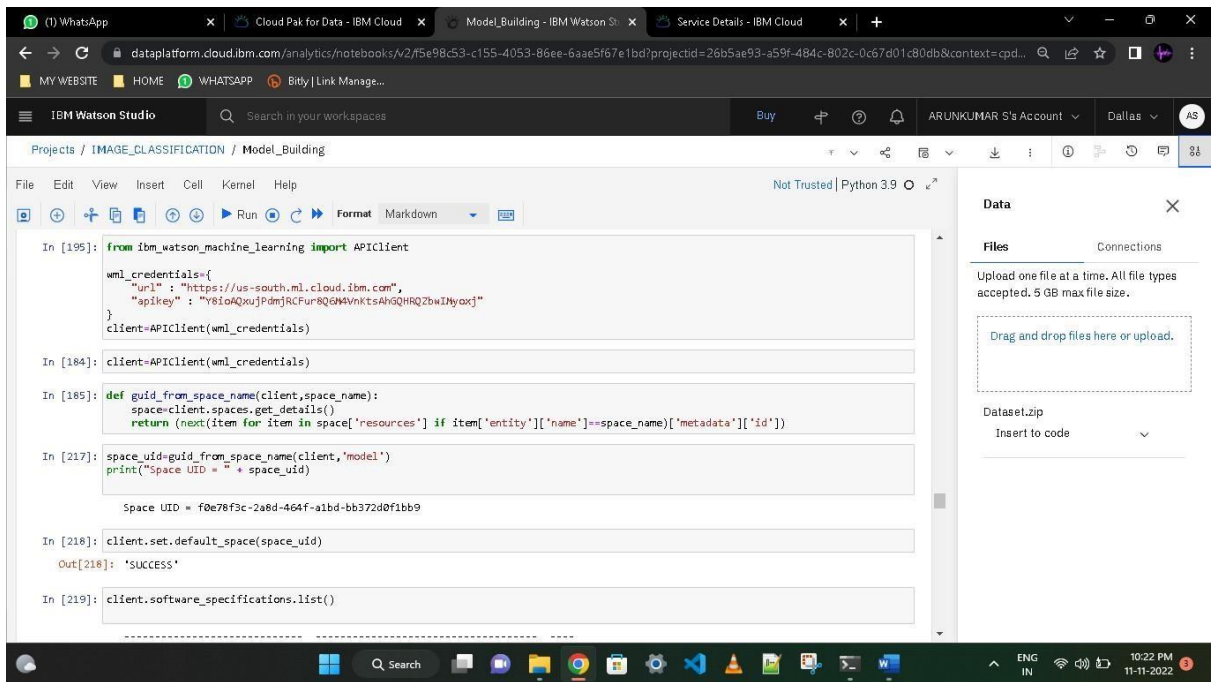
Cloud object storage

89.2 MB used

IBM Cloud account

Name: ARUNKUMAR S's Account
ID: e877a29349614c2a84759a1df2cc02





IBM Watson Studio interface showing a project named "Model_Building" under the "IMAGE_CLASSIFICATION" workspace. The interface includes a file explorer, a code editor, and a data panel.

File Explorer: Lists various software specifications (NAME) and their corresponding Asset IDs (ASSET_ID) and Types (TYPE).

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-e7b665ff687	base
spark-mllib_3.0-scala_2.12	09f4cf0-90a7-5899-b0ed-1ef348aebdee	base
pytorch-onnx_rt22.1-py3.9	0b8464d4-ed81-5599-be11-b5f6fccc6a71	base
ai-function_0.1-py3.6	0c0b0f1e-5376-4f4d-92dd-da3b69aa9bda	base
shiny-r3.6	0e6e79df-875e-4f24-8ae9-62d2c2148306	base
tensorflow_2.4-py3.7-horovod	1092590a-307d-563d-9b62-4eb7d6ab3f22	base
pytorch_1.1-py3.6	10ac12d6-6b30-4ccd-8392-3e922c896a92	base
tensorflow_1.15-py3.6-ddl	111e41b3-de2d-5422-a4d6-bf776826c4b7	base
autoai-kb_rt22.2-py3.10	125b6d9a-5b1f-5e8d-972a-b251688cc140	base
runtime-22.1-py3.9	12b83a17-24d8-5082-900f-0ab31fbfd3cb	base
scikit-learn_0.22-py3.6	154010fa-5b3b-4ac1-82af-4d5ee5abbca5	base
default_r3.6	1b70aec3-ab34-4b87-8aa0-a4a3c8296a36	base
pytorch-onnx_1.3-py3.6	1bc6029a-cc97-56da-b8e0-39c388d8bbe7	base
kernel-spark3.3-r3.6	1c9e5454-f216-59dd-a20e-474a5cdf958b	base
pytorch-onnx_rt22.1-py3.9-edt	1d362186-7ad5-5d59-8a6c-9d080b0de37f	base
tensorflow_2.1-py3.6	1eb25b84-d6ed-5dde-b6a5-3fbd1f665666	base
spark-mllib_3.2	20047f72-0a98-58c7-9ff5-a77b012eb8f5	base
tensorflow_2.4-py3.8-horovod	217c16f6-178f-56bf-824a-b19f20564c49	base
runtime-22.1-py3.9-cuda	26215f05-08c3-5441-a1b0-da66306ce658	base
do_py3.8	295addb5-9ef9-547e-9bf4-92ae3563e720	base
autoai-ts_3.8-py3.8	2aa0c302-798f-5ae9-abd6-15e0c24027b5	base
tensorflow_1.15-py3.6	2b73a275-7c6f-420b-a912-eae7f436e8bc	base
kernel-spark3.3-py3.9	2b7961e2-e3b1-5a8c-a491-482c8368683a	base
subspark_1.3-py3.6	2c0cf731-2002-4b71-a388-2c6f0072d3a5	base

Code Editor: Shows a Jupyter Notebook cell with the following code:

```
Note: Only first 50 records were displayed. To display more use 'limit' parameter.
```

```
In [220]: software_spec_uid = client.software_specifications.get_uid_by_name("default_py3.6")
          software_spec_uid
```

```
Out[220]: '0062b8c9-8b7d-44a0-a9b9-46c416adcbd9'
```

```
In [ ]:
```

```
In [ ]:
```

```
In [222]: pip install ibm_watson_machine_learning
```

Data Panel: Shows a "Files" section with a message: "Upload one file at a time. All file types accepted. 5 GB max file size." and a "Dataset.zip" file listed below.

IBM Watson Studio interface showing a Jupyter Notebook for image classification. The notebook is titled "Model_Building" and is part of a project named "IMAGE_CLASSIFICATION". The interface includes a file explorer, a code editor, and a data panel on the right.

The code in the notebook is as follows:

```
In [ ]: client.repository.download(model_id, 'my_model.tar.gz')

In [ ]: from keras.models import load_model
        from keras.preprocessing import image

In [ ]: model=load_model("nutrition.h5")

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: from tensorflow.keras.models import load_model
        from keras.preprocessing import image
        model = load_model("nutrition.h5")

In [ ]:

In [ ]: import numpy as np
        x = image.img_to_array(img)
```

The output of the notebook shows the model's prediction for a given image:

```
Out[58]: array([0])

In [ ]: index=['APPLES', 'BANANA', 'ORANGE', 'PINEAPPLE', 'WATERMELON']
        result=str(index[classes_x[0]])
        result
```

The data panel on the right shows a "Files" section with a message: "Upload one file at a time. All file types accepted. 5 GB max file size." and a "Dataset.zip" section with a message: "Insert to code".

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Model_Building - IBM Watson St

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Name	Group	Location	Product	Status	Tags
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Watson Studio-ot	Default	Dallas	Watson Studio	Active	
Watson Machine Learning-ju	Default	Dallas	Watson Machine Learning	Active	

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Cloud Object Storage

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Cloud Object Storage-of

Buckets

Integrations

Endpoints

Usage details

Service credentials

Connections

Plan

Buckets

Buckets serve as containers for objects, and can be individually configured in terms of their location, resiliency, billing rates, security, and object lifecycle rules.

Search

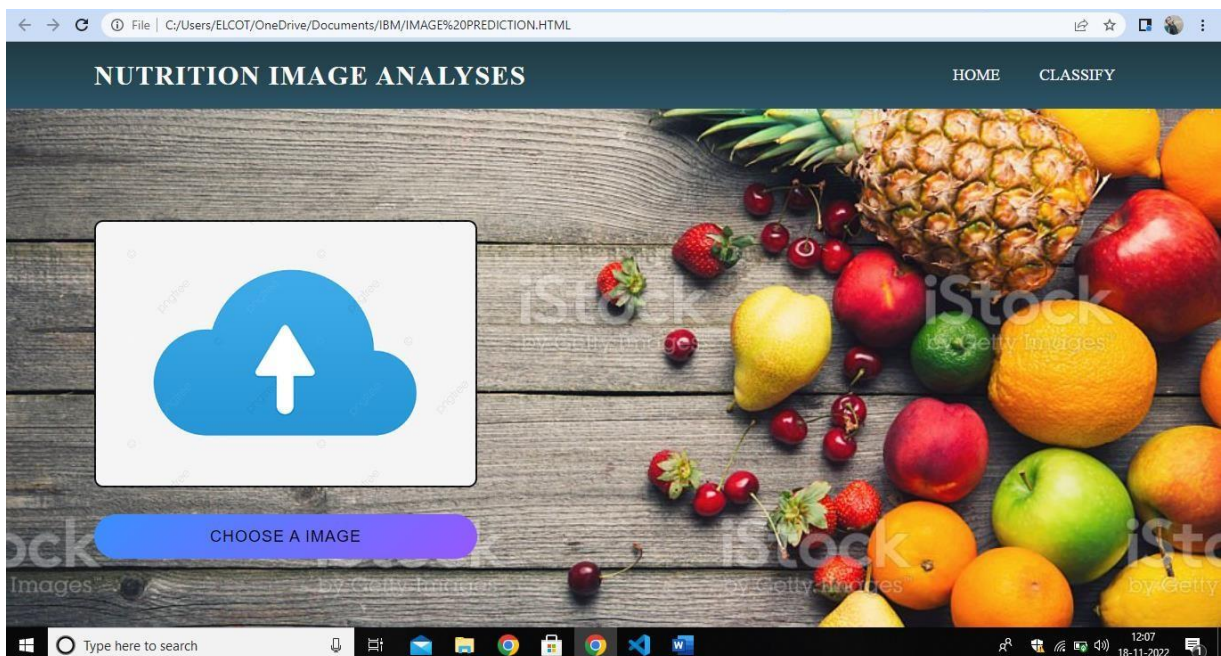
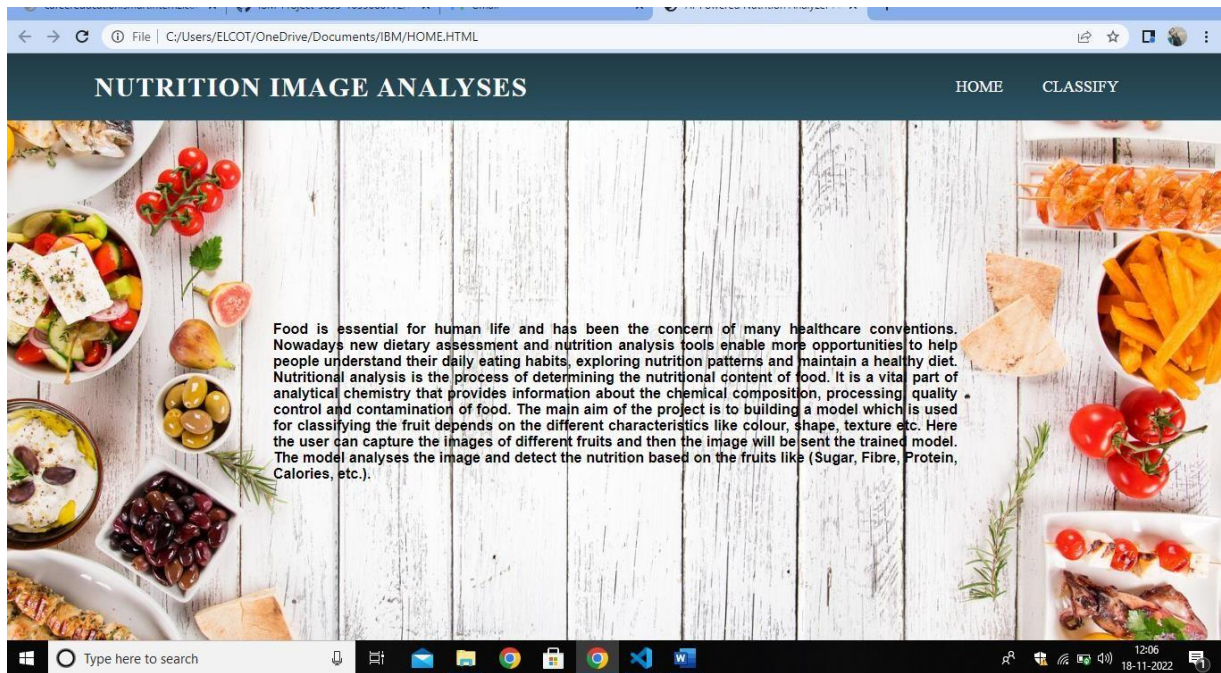
Create bucket

Name	Public access	Location	Storage class	Created
04a2512b-b6dc-461f-8071-5d162f64c86d	No	us-south	Standard	2022-11-11 6:21 PM
b093cbba-2293-4e6b-b5c1-a47c74f2a51c	No	us-south	Standard	2022-11-11 9:18 PM
imageclassification-donotdelete-pr-v1604oqevxtyin	No	us-geo	Standard	2022-11-11 3:44 PM
model-donotdelete-pr-wkmi3rbetzs49	No	us-geo	Standard	2022-11-11 9:12 PM

21°C Partly cloudy

Search

ENG IN 10:27 PM 11-11-2022



Upload Image to classify:

Choose...



Food Classified is:

APPLES

```
[{'sugar_g': 10.3, 'fiber_g': 2.4, 'serving_size_g': 100.0, 'sodium_mg': 1, 'name': 'apples', 'potassium_mg': 11, 'fat_saturated_g': 0.0, 'fat_total_g': 0.2, 'calories': 53.4, 'cholesterol_mg': 0, 'protein_g': 0.3, 'carbohydrates_total_g': 13.8}]
```

Activity
Data