

Sprint-4

Deployment – IBM Cloud

Date	13 November 2022
Team ID	PNT2022TMID27756
Project Name	AI-powered Nutrition Analyzer for Fitness Enthusiasts
Maximum Marks	

The screenshot shows the IBM Watson Studio interface. At the top, there's a navigation bar with 'IBM Watson Studio', a search bar, and user account information. Below this, the breadcrumb 'Projects / Image_Prediction / Model_Building' is visible. The main area contains a Jupyter Notebook with a terminal output. The terminal shows the execution of 'pwd' and 'pip install keras==2.2.4' and 'pip install tensorflow==1.14.0'. The output indicates that the packages are being collected and installed, with some dependencies already satisfied. The terminal output is as follows:

```
In [31]: pwd
Out[31]: '/home/wsuser/work'

In [23]: !pip install keras==2.2.4
!pip install tensorflow==1.14.0

Collecting keras==2.2.4
  Using cached Keras-2.2.4-py2.py3-none-any.whl (312 kB)
Requirement already satisfied: six>=1.9.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (1.15.0)
Requirement already satisfied: keras-preprocessing>=1.0.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (1.1.2)
Requirement already satisfied: h5py in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (3.2.1)
Requirement already satisfied: keras-applications>=1.0.6 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (1.0.8)
Requirement already satisfied: scipy>=0.14 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (1.7.3)
Requirement already satisfied: numpy>=1.9.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (1.20.3)
Requirement already satisfied: pyyaml in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from keras==2.2.4) (5.4.1)
Installing collected packages: keras
  Attempting uninstall: keras
    Found existing installation: keras 2.7.0
    Uninstalling keras-2.7.0:
      Successfully uninstalled keras-2.7.0
```


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()
```

← → ↻ 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 [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 and
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

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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)
    [redacted] 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-clie
nt) (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-clie
nt) (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-clie
nt) (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->boto
3->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,>=1.2
1.21->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-learnin
g-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-learnin
g-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.
```

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In [10]:

```
from ibm_watson_machine_learning import APIClient
wml_credentials = {
    "url": "https://us-south.ml.cloud.ibm.com",
    "apikey": "25L9812df8spf3YMybahpDQFRVcUOkISZOm_ywLYjP3S"
}
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-a9b9-46c416adcdb9	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-pv3.6	09c5a1d0-9c1e-4473-a344-eb7b665ff687	base