IBM DEPLOYMENT

Input;

!pip install watson-machine-learning-client

Output;

Collecting watson-machine-learning-client

Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)
███████████████████████████████████ | 538 kB 16.8 MB/s eta 0:00:01
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: tqdm in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (4.62.3)
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: certifi in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2022.9.24)
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: pandas in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.3.4)
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: 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: urllib3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.26.7)
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: 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: 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-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: 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: charset-normalizer~=2.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->watson-machine-learning-client) (2.0.4)
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) (3.3)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas->watson-machine-learning-client) (2021.3)

Requirement already satisfied: numpy>=1.17.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-pack
ages (from pandas->watson-machine-learning-client) (1.20.3)
Installing collected packages: watson-machine-learning-client
Successfully installed watson-machine-learning-client-1.0.391

```python
from ibm_watson_machine_learning import APIClient
wml_credentials={
"url":"https://us-south.ml.cloud.ibm.com",
"apikey":"R5ep2OIuDK0SzPR6_yGxrz8qrIKR7qfZlV7L88KTrBEO"
}

client=APIClient(wml_credentials)
```

```python
client
```

```python
def guid_space_name(client,Digit_deploy):
space=client.spaces.get_details()
return(next(item for item in space['resources'] if
item['entity']['name']==Digit_deploy)['metadata']['id'])
```

Input;

```python
space_uid=guid_space_name(client,'Digit_deploy')
print("Space UID "+space_uid)
```

Output;

Space UID 0bd78937-53fe-415f-8dfc-d064c7fd214a

Input;

```python
client.set.default_space(space_uid)
```

Output;

'SUCCESS'

Input;

```python
client.software_specifications.list(200)
```

Output;

```
------------------------------  ----------------------------------  ----
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
spark-mllib_3.0-scala_2.12  09f4cff0-90a7-5899-b9ed-1ef348aebdee  base
pytorch-onnx_rt22.1-py3.9  0b848dd4-e681-5599-be41-b5f6fccc6471   base
ai-function_0.1-py3.6     0cdb0f1e-5376-4f4d-92dd-da3b69aa9bda    base
shiny-r3.6                0e6e79df-875e-4f24-8ae9-62dcc2148306    base
tensorflow_2.4-py3.7-horovod  1092590a-307d-563d-9b62-4eb7d64b3f22  base
pytorch_1.1-py3.6         10ac12d6-6b30-4ccd-8392-3e922c096a92    base
tensorflow_1.15-py3.6-ddl  111e41b3-de2d-5422-a4d6-bf776828c4b7   base
runtime-22.1-py3.9        12b83a17-24d8-5082-900f-0ab31fbfd3cb    base
scikit-learn_0.22-py3.6   154010fa-5b3b-4ac1-82af-4d5ee5abbc85    base
default_r3.6              1b70aec3-ab34-4b87-8aa0-a4a3c8296a36    base
pytorch-onnx_1.3-py3.6    1bc6029a-cc97-56da-b8e0-39c3880dbbe7    base
kernel-spark3.3-r3.6      1c9e5454-f216-59dd-a20e-474a5cdf5988    base
pytorch-onnx_rt22.1-py3.9-edt  1d362186-7ad5-5b59-8b6c-9d0880bde37f  base
tensorflow_2.1-py3.6      1eb25b84-d6ed-5dde-b6a5-3fbdf1665666    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   26215f05-08c3-5a41-a1b0-da66306ce658    base
do_py3.8                  295addb5-9ef9-547e-9bf4-92ae3563e720    base
autoai-ts_3.8-py3.8       2aa0c932-798f-5ae9-abd6-15e0c2402fb5    base
tensorflow_1.15-py3.6     2b73a275-7cbf-420b-a912-eae7f436e0bc    base
kernel-spark3.3-py3.9     2b7961e2-e3b1-5a8c-a491-482c8368839a    base
pytorch_1.2-py3.6         2c8ef57d-2687-4b7d-acce-01f94976dac1    base
spark-mllib_2.3           2e51f700-bca0-4b0d-88dc-5c6791338875    base
pytorch-onnx_1.1-py3.6-edt  32983cea-3f32-4400-8965-dde874a8d67e  base
spark-mllib_3.0-py37      36507ebe-8770-55ba-ab2a-eafe787600e9    base
spark-mllib_2.4           390d21f8-e58b-4fac-9c55-d7ceda621326    base
xgboost_0.82-py3.6        39e31acd-5f30-41dc-ae44-60233c80306e    base
pytorch-onnx_1.2-py3.6-edt  40589d0e-7019-4e28-8daa-fb03b6f4fe12  base
default_r36py38           41c247d3-45f8-5a71-b065-8580229facf0    base
autoai-ts_rt22.1-py3.9    4269d26e-07ba-5d40-8f66-2d495b0c71f7    base
autoai-obm_3.0            42b92e18-d9ab-567f-988a-4240ba1ed5f7    base
pmml-3.0_4.3              493bcb95-16f1-5bc5-bee8-81b8af80e9c7    base
spark-mllib_2.4-r_3.6     49403dff-92e9-4c87-a3d7-a42d0021c095    base
xgboost_0.90-py3.6        4ff8d6c2-1343-4c18-85e1-689c965304d3    base
pytorch-onnx_1.1-py3.6    50f95b2a-bc16-43bb-bc94-b0bed208c60b    base
autoai-ts_3.9-py3.8       52c57136-80fa-572e-8728-a5e7cbb42cde    base
spark-mllib_2.4-scala_2.11  55a70f99-7320-4be5-9fb9-9edb5a443af5  base
spark-mllib_3.0           5c1b0ca2-4977-5c2e-9439-ffd44ea8ffe9    base
autoai-obm_2.0            5c2e37fa-80b8-5e77-840f-d912469614ee    base
spss-modeler_18.1         5c3cad7e-507f-4b2a-a9a3-ab53a21dee8b    base
cuda-py3.8                5d3232bf-c86b-5df4-a2cd-7bb870a1cd4e    base
autoai-kb_3.1-py3.7       632d4b22-10aa-5180-88f0-f52dfb6444d7    base
pytorch-onnx_1.7-py3.8    634d3cdc-b562-5bf9-a2d4-ea90a478456b    base
spark-mllib_2.3-r_3.6     6586b9e3-ccd6-4f92-900f-0f8cb2bd6f0c    base
tensorflow_2.4-py3.7      65e171d7-72d1-55d9-8ebb-f813d620c9bb    base
spss-modeler_18.2         687eddc9-028a-4117-b9dd-e57b36f1efa5    base
```

```
pytorch-onnx_1.2-py3.6        692a6a4d-2c4d-45ff-a1ed-b167ee55469a              base
spark-mllib_2.3-scala_2.11    7963efe5-bbec-417e-92cf-0574e21b4e8d              base
spark-mllib_2.4-py37          7abc992b-b685-532b-a122-a396a3cdbaab              base
caffe_1.0-py3.6               7bb3dbe2-da6e-4145-918d-b6d84aa93b6b              base
pytorch-onnx_1.7-py3.7        812c6631-42b7-5613-982b-02098e6c909c              base
cuda-py3.6                    82c79ece-4d12-40e6-8787-a7b9e0f62770              base
tensorflow_1.15-py3.6-horovod 8964680e-d5e4-5bb8-919b-8342c6c0dfd8              base
hybrid_0.1                    8c1a58c6-62b5-4dc4-987a-df751c2756b6              base
pytorch-onnx_1.3-py3.7        8d5d8a87-a912-54cf-81ec-3914adaa988d              base
caffe-ibm_1.0-py3.6           8d863266-7927-4d1e-97d7-56a7f4c0a19b              base
spss-modeler_17.1             902d0051-84bd-4af6-ab6b-8f6aa6fdeabb              base
do_12.10                      9100fd72-8159-4eb9-8a0b-a87e12eefa36              base
do_py3.7                      9447fa8b-2051-4d24-9eef-5acb0e3c59f8              base
spark-mllib_3.0-r_3.6         94bb6052-c837-589d-83f1-f4142f219e32              base
cuda-py3.7-opence             94e9652b-7f2d-59d5-ba5a-23a414ea488f              base
nlp-py3.8                     96e60351-99d4-5a1c-9cc0-473ac1b5a864              base
cuda-py3.7                    9a44990c-1aa1-4c7d-baf8-c4099011741c              base
hybrid_0.2                    9b3f9040-9cee-4ead-8d7a-780600f542f7              base
spark-mllib_3.0-py38          9f7a8fc1-4d3c-5e65-ab90-41fa8de2d418              base
autoai-kb_3.3-py3.7           a545cca3-02df-5c61-9e88-998b09dc79af              base
spark-mllib_3.0-py39          a6082a27-5acc-5163-b02c-6b96916eb5e0              base
runtime-22.1-py3.9-do         a7e7dbf1-1d03-5544-994d-e5ec845ce99a              base
default_py3.8                 ab9e1b80-f2ce-592c-a7d2-4f2344f77194              base
tensorflow_rt22.1-py3.9       acd9c798-6974-5d2f-a657-ce06e986df4d              base
kernel-spark3.2-py3.9         ad7033ee-794e-58cf-812e-a95f4b64b207              base
autoai-obm_2.0 with Spark 3.0 af10f35f-69fa-5d66-9bf5-acb58434263a              base
default_py3.7_opence          c2057dd4-f42c-5f77-a02f-72bdbd3282c9              base
tensorflow_2.1-py3.7          c4032338-2a40-500a-beef-b01ab2667e27              base
do_py3.7_opence               cc8f8976-b74a-551a-bb66-6377f8d865b4              base
spark-mllib_3.3               d11f2434-4fc7-58b7-8a62-755da64fdaf8              base
autoai-kb_3.0-py3.6           d139f196-e04b-5d8b-9140-9a10ca1fa91a              base
spark-mllib_3.0-py36          d82546d5-dd78-5fbb-9131-2ec309bc56ed              base
autoai-kb_3.4-py3.8           da9b39c3-758c-5a4f-9cfd-457dd4d8c395              base
kernel-spark3.2-r3.6          db2fe4d6-d641-5d05-9972-73c654c60e0a              base
autoai-kb_rt22.1-py3.9        db6afe93-665f-5910-b117-d879897404d9              base
tensorflow_rt22.1-py3.9-horovod dda170cc-ca67-5da7-9b7a-cf84c6987fae            base
autoai-ts_1.0-py3.7           deef04f0-0c42-5147-9711-89f9904299db              base
tensorflow_2.1-py3.7-horovod  e384fce5-fdd1-53f8-bc71-11326c9c635f              base
default_py3.7                 e4429883-c883-42b6-87a8-f419d64088cd              base
do_22.1                       e51999ba-6452-5f1f-8287-17228b88b652              base
autoai-obm_3.2                eae86aab-da30-5229-a6a6-1d0d4e368983              base
do_20.1                       f686cdd9-7904-5f9d-a732-01b0d6b10dc5              base
scikit-learn_0.19-py3.6       f963fa9d-4bb7-5652-9c5d-8d9289ef6ad9              base
tensorflow_2.4-py3.8          fe185c44-9a99-5425-986b-59bd1d2eda46              base
------------------------------ ------------------------------------ ----
```

software_space_uid=client**.**software_specifications**.**get_uid_by_name('tensorflow_rt22.1-py3.9')

Input;

software_space_uid

Output;

'acd9c798-6974-5d2f-a657-ce06e986df4d'

Input;

!tar -zcvf digit-recognition.tgz mnistCNN.h5

Output;

mnistCNN.h5

Input;

ls

Output;

digit-recognition.tgz mnistCNN.h5 models/

Input;

```
model_details=client.repository.store_model(model='digit-recognition.tgz',meta_props={
client.repository.ModelMetaNames.NAME:"CNN Model Building",
client.repository.ModelMetaNames.TYPE:'tensorflow_2.7',
client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_space_uid
})
model_id=client.repository.get_model_id(model_details)
```

Input;

model_id

Output;

'2550f0a7-813c-409c-bfe6-e3fcb3b7e615'

Input;

client**.**repository**.**download(model_id,'digit.tar.gb')

Output;

Successfully saved model content to file: 'digit.tar.gb'
'/home/wsuser/work/digit.tar.gb'

Input;

Is

Output;

digit-recognition.tgz digit.tar.gb mnistCNN.h5 models/