SAVING THE MODEL

In [ ]:

*#saving the model*model.save('realtime.h5')

In [ ]:

#converting to tar!tar -zcvf realtime.tgz realtime.h5

realtime.h5

CLOUD DEPLOYMENT

In [ ]:

!pip install watson-machine-learning-client

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/

Collecting watson-machine-learning-client

　Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)

　　|██
█| 538 kB 7.3 MB/s

Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (2.23.0)

Collecting lomond

　Downloading lomond-0.3.3-py2.py3-none-any.whl (35 kB)

Requirement already satisfied: tabulate in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (0.8.10)

Requirement already satisfied: certifi in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (2022.9.24)

Collecting boto3

　Downloading boto3-1.26.8-py3-none-any.whl (132 kB)

　　|██
█| 132 kB 39.8 MB/s

Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (1.3.5)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (1.24.3)

Collecting ibm-cos-sdk

　Downloading ibm-cos-sdk-2.12.0.tar.gz (55 kB)

```
     |████████████████████████████████████████████████
██|  55 kB 4.8 MB/s
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-
packages (from watson-machine-learning-client) (4.64.1)
Collecting s3transfer<0.7.0,>=0.6.0
  Downloading s3transfer-0.6.0-py3-none-any.whl (79 kB)
     |████████████████████████████████████████████████
██|  79 kB 9.2 MB/s
Collecting botocore<1.30.0,>=1.29.8
  Downloading botocore-1.29.8-py3-none-any.whl (9.9 MB)
     |████████████████████████████████████████████████
██|  9.9 MB 53.6 MB/s
Collecting jmespath<2.0.0,>=0.7.1
  Downloading jmespath-1.0.1-py3-none-any.whl (20 kB)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from botocore<1.30.0,>=1.29.8->boto3
->watson-machine-learning-client) (2.8.2)
Collecting urllib3
  Downloading urllib3-1.26.12-py2.py3-none-any.whl (140 kB)
     |████████████████████████████████████████████████
██|  140 kB 59.3 MB/s
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.30.0,>=1.2
9.8->boto3->watson-machine-learning-client) (1.15.0)
Collecting ibm-cos-sdk-core==2.12.0
  Downloading ibm-cos-sdk-core-2.12.0.tar.gz (956 kB)
     |████████████████████████████████████████████████
██|  956 kB 54.0 MB/s
Collecting ibm-cos-sdk-s3transfer==2.12.0
  Downloading ibm-cos-sdk-s3transfer-2.12.0.tar.gz (135 kB)
     |████████████████████████████████████████████████
██|  135 kB 51.1 MB/s
Collecting jmespath<2.0.0,>=0.7.1
  Downloading jmespath-0.10.0-py2.py3-none-any.whl (24 kB)
Collecting requests
  Downloading requests-2.28.1-py3-none-any.whl (62 kB)
     |████████████████████████████████████████████████
██|  62 kB 1.4 MB/s
```

Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->watson-machine-learning-
client) (2.1.1)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->watson-machine-learning-client) (2.10)

Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas->watson-machine-learning-client) (2022.6)

Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas->watson-machine-learning-client) (1.21.
6)

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core,
 ibm-cos-sdk-s3transfer

  Building wheel for ibm-cos-sdk (setup.py) ... done

  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.12.0-py3-none
-any.whl size=73931 sha256=5d002be559f85f7e6ef7c2b32b1898204772912156
72a0c2ba61eb4944fb902c

  Stored in directory: /root/.cache/pip/wheels/ec/94/29/2b57327cf0066
4b6614304f7958abd29d77ea0e5bbece2ea57

  Building wheel for ibm-cos-sdk-core (setup.py) ... done

  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.12.
0-py3-none-any.whl size=562962 sha256=898299ee401f79fd8ad67a1115474b8
4f8bde2c5a4dfc4d9bf146ae727ab2c33

  Stored in directory: /root/.cache/pip/wheels/64/56/fb/5cd6f4f40406c
828a5289b95b2752a4d142a9afb359244ed8d

  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done

  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3tr
ansfer-2.12.0-py3-none-any.whl size=89778 sha256=87cd52eb26669ea97269
f11a6119523adac3c132633f3f52496ee0df122daa56

  Stored in directory: /root/.cache/pip/wheels/57/79/6a/ffe3370ed7ebc
00604f9f76766e1e0348dcdcad2b2e32df9e1

Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfe
r

Installing collected packages: urllib3, requests, jmespath, ibm-cos-s
dk-core, botocore, s3transfer, ibm-cos-sdk-s3transfer, lomond, ibm-co
s-sdk, boto3, watson-machine-learning-client

  Attempting uninstall: urllib3

    Found existing installation: urllib3 1.24.3

    Uninstalling urllib3-1.24.3:

      Successfully uninstalled urllib3-1.24.3

Attempting uninstall: requests

    Found existing installation: requests 2.23.0

    Uninstalling requests-2.23.0:

      Successfully uninstalled requests-2.23.0

Successfully installed boto3-1.26.8 botocore-1.29.8 ibm-cos-sdk-2.12.0 ibm-cos-sdk-core-2.12.0 ibm-cos-sdk-s3transfer-2.12.0 jmespath-0.10.0 lomond-0.3.3 requests-2.28.1 s3transfer-0.6.0 urllib3-1.26.12 watson-machine-learning-client-1.0.391

In [ ]:

!pip install ibm_watson_machine_learning

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/

Collecting ibm_watson_machine_learning

  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.8 MB)

    |██| 1.8 MB 6.3 MB/s

Requirement already satisfied: packaging in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (21.3)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (1.26.12)

Requirement already satisfied: certifi in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (2022.9.24)

Requirement already satisfied: importlib-metadata in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (4.13.0)

Requirement already satisfied: lomond in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (0.3.3)

Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (2.28.1)

Collecting ibm-cos-sdk==2.7.*

  Downloading ibm-cos-sdk-2.7.0.tar.gz (51 kB)

    |██| 51 kB 902 kB/s

Requirement already satisfied: tabulate in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (0.8.10)

Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /usr/local/lib/python3.7/dist-packages (from ibm_watson_machine_learning) (1.3.5)

Collecting ibm-cos-sdk-core==2.7.0

  Downloading ibm-cos-sdk-core-2.7.0.tar.gz (824 kB)

```
        |████████████████████████████████████████████
██| 824 kB 50.2 MB/s
Collecting ibm-cos-sdk-s3transfer==2.7.0
  Downloading ibm-cos-sdk-s3transfer-2.7.0.tar.gz (133 kB)
        |████████████████████████████████████████████
██| 133 kB 57.0 MB/s
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /usr/local/l
ib/python3.7/dist-packages (from ibm-cos-sdk==2.7.*->ibm_watson_machi
ne_learning) (0.10.0)
Collecting docutils<0.16,>=0.10
  Downloading docutils-0.15.2-py3-none-any.whl (547 kB)
        |████████████████████████████████████████████
██| 547 kB 48.1 MB/s
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0->ibm-co
s-sdk==2.7.*->ibm_watson_machine_learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_learn
ing) (2022.6)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_lea
rning) (1.21.6)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.7.
0->ibm-cos-sdk==2.7.*->ibm_watson_machine_learning) (1.15.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->ibm_watson_machine_learning) (2.10)
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learn
ing) (2.1.1)
Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local
/lib/python3.7/dist-packages (from importlib-metadata->ibm_watson_mac
hine_learning) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/
dist-packages (from importlib-metadata->ibm_watson_machine_learning)
(3.10.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /usr/local
/lib/python3.7/dist-packages (from packaging->ibm_watson_machine_lear
ning) (3.0.9)
```

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer
  Building wheel for ibm-cos-sdk (setup.py) ... done
  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.7.0-py2.py3-none-any.whl size=72563 sha256=85acfdaf3f232b65d3165854c3cf4651cc494f01dc7874276f118863e97fcf8c
  Stored in directory: /root/.cache/pip/wheels/47/22/bf/e1154ff0f5de93cc477acd0ca69abfbb8b799c5b28a66b44c2
  Building wheel for ibm-cos-sdk-core (setup.py) ... done
  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.7.0-py2.py3-none-any.whl size=501013 sha256=dfdd3d79b764119c0dfbc72b7436f7523e387abbbde90178014432a4d0dbbd1c
  Stored in directory: /root/.cache/pip/wheels/6c/a2/e4/c16d02f809a3ea998e17cfd02c13369281f3d232aaf5902c19
  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done
  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3transfer-2.7.0-py2.py3-none-any.whl size=88622 sha256=d873231166da3e2723cdd9e44570258db0735b07a5f7c505365cbdb0f8cb74be
  Stored in directory: /root/.cache/pip/wheels/5f/b7/14/fbe02bc1ef1af890650c7e51743d1c83890852e598d164b9da
Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfer
Installing collected packages: docutils, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer, ibm-cos-sdk, ibm-watson-machine-learning
  Attempting uninstall: docutils
    Found existing installation: docutils 0.17.1
    Uninstalling docutils-0.17.1:
      Successfully uninstalled docutils-0.17.1
  Attempting uninstall: ibm-cos-sdk-core
    Found existing installation: ibm-cos-sdk-core 2.12.0
    Uninstalling ibm-cos-sdk-core-2.12.0:
      Successfully uninstalled ibm-cos-sdk-core-2.12.0
  Attempting uninstall: ibm-cos-sdk-s3transfer
    Found existing installation: ibm-cos-sdk-s3transfer 2.12.0
    Uninstalling ibm-cos-sdk-s3transfer-2.12.0:
      Successfully uninstalled ibm-cos-sdk-s3transfer-2.12.0
  Attempting uninstall: ibm-cos-sdk
    Found existing installation: ibm-cos-sdk 2.12.0

```
      Uninstalling ibm-cos-sdk-2.12.0:
        Successfully uninstalled ibm-cos-sdk-2.12.0
Successfully installed docutils-0.15.2 ibm-cos-sdk-2.7.0 ibm-cos-sdk-
core-2.7.0 ibm-cos-sdk-s3transfer-2.7.0 ibm-watson-machine-learning-1.
0.257
```

In [ ]:

```
from ibm_watson_machine_learning import APIClient
cloud_credentials={
      "url":"https://eu-gb.ml.cloud.ibm.com",
      "apikey":"JjbZw3a4R8S9m1hkHRzyhox5pPW_15Cc39WxdpFYy_eA"}
client=APIClient(cloud_credentials)
```

Python 3.7 and 3.8 frameworks are deprecated and will be removed in a
future release. Use Python 3.9 framework instead.

In [ ]:

```
client.spaces.get_details()
```

Out[ ]:

```
{'resources': [{'entity': {'compute': [{'crn': 'crn:v1:bluemix:public:
pm-20:eu-gb:a/baf2fc8d7ee845f0b6f7ac004c72284e:66c03ce9-a400-4357-896
3-42f65995d1d6::',
      'guid': '66c03ce9-a400-4357-8963-42f65995d1d6',
      'name': 'Watson Machine Learning-oy',
      'type': 'machine_learning'}],
    'description': '',
    'name': 'realtime_deploy',
    'scope': {'bss_account_id': 'baf2fc8d7ee845f0b6f7ac004c72284e'},
    'stage': {'production': False},
    'status': {'state': 'active'},
    'storage': {'properties': {'bucket_name': 'ea8ff2b0-81e6-4923-aa7
8-fe4cbe1dcd18',
      'bucket_region': 'eu-gb-standard',
      'credentials': {'admin': {'access_key_id': 'e999e8ed9ad2445ca88
ae10af451d567',
        'api_key': 'fkP3BO6ykhgejJJwiaTEmtxAjRznQ1cnQoFxw6ZYhi2q',
        'secret_access_key': '3148c14f7dfbe93c803cd44ab7906253620836f
95549b74f',
        'service_id': 'ServiceId-a8d83975-cb8a-45b6-8a0b-2ef8c5e46143
'},
```

        'editor': {'access_key_id': 'f024630ce04d42339708fac182f0ab39',
         'api_key': 'mcCE4FeS7xgQJkxKtxFFqWepQy8KM4GlSCVBCSN-fwUj',
         'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
         'secret_access_key': '7153814f9855ae7da467ce49bbfcfbbac827584
02be72ecb',
         'service_id': 'ServiceId-c681d0d0-1da1-4b75-a76e-966b2d01ac94
'},
        'viewer': {'access_key_id': '3a85fecc33094296a617c4fb8671a6a8',
         'api_key': 'h7Q07ClgcxsXIiQxTxqrz0810f0RSup70bHelCsAsueb',
         'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
         'secret_access_key': '402f3531b91713996a937d5d03b47f6dc8f1392
371275b8a',
         'service_id': 'ServiceId-f4cdb334-b0d8-4f02-9cff-ffb579be7ad9
'}},
        'endpoint_url': 'https://s3.eu-gb.cloud-object-storage.appdomai
n.cloud',
        'guid': 'b3296065-0e0c-41e2-94ef-9ce2d0f52335',
        'resource_crn': 'crn:v1:bluemix:public:cloud-object-storage:glo
bal:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-9ce2d0
f52335::'},
       'type': 'bmcos_object_storage'}},
    'metadata': {'created_at': '2022-11-12T08:02:21.536Z',
     'creator_id': 'IBMid-663003YGW8',
     'id': '4afa8b26-897b-4309-b86e-5a89d939e183',
     'updated_at': '2022-11-12T08:02:35.769Z',
     'url': '/v2/spaces/4afa8b26-897b-4309-b86e-5a89d939e183'}}]}

In [ ]:

```python
space_uid='4afa8b26-897b-4309-b86e-5a89d939e183' space_uid
```

Out[ ]:

'4afa8b26-897b-4309-b86e-5a89d939e183'

In [ ]:

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

Out[ ]:

'SUCCESS'

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

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

```
model_details=client.repository.store_model(model='realtime.tgz',me
ta_props={
    client.repository.ModelMetaNames.NAME:"REALTIME_CLOUD",
    client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",

client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_space_u
id})
```

```
model_details
```

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'software_spec': {'id': 'acd9c798-6974-5d2f-a657-ce06e986df4d',
   'name': 'tensorflow_rt22.1-py3.9'},
  'type': 'tensorflow_2.7'},
 'metadata': {'created_at': '2022-11-12T08:27:11.689Z',
  'id': '1966b2e6-917e-402f-9587-bfaca4a14953',
  'modified_at': '2022-11-12T08:27:17.972Z',
  'name': 'REALTIME_CLOUD',
  'owner': 'IBMid-663003YGW8',
  'resource_key': '46bcf134-f27f-4620-a04e-8b9798c79b9a',
  'space_id': '4afa8b26-897b-4309-b86e-5a89d939e183'},
 'system': {'warnings': []}}
```

```
model_id=client.repository.get_model_id(model_details)model_id
```

```
'1966b2e6-917e-402f-9587-bfaca4a14953'
```

```
client.repository.download(model_id,'REALTIME_CLOUD.tar.gb')
Successfully saved model content to file: 'REALTIME_CLOUD.tar.gb'
```

'/content/REALTIME_CLOUD.tar.gb'

SAVING THE MODEL

*#saving the model*model.save('realtime.h5')

#converting to tar!tar -zcvf realtime.tgz realtime.h5

realtime.h5

CLOUD DEPLOYMENT

!pip install watson-machine-learning-client

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.de v/colab-wheels/public/simple/

Collecting watson-machine-learning-client

  Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)

    |██ ██| 538 kB 7.3 MB/s

Requirement already satisfied: requests in /usr/local/lib/python3.7/d ist-packages (from watson-machine-learning-client) (2.23.0)

Collecting lomond

  Downloading lomond-0.3.3-py2.py3-none-any.whl (35 kB)

Requirement already satisfied: tabulate in /usr/local/lib/python3.7/d ist-packages (from watson-machine-learning-client) (0.8.10)

Requirement already satisfied: certifi in /usr/local/lib/python3.7/di st-packages (from watson-machine-learning-client) (2022.9.24)

Collecting boto3

  Downloading boto3-1.26.8-py3-none-any.whl (132 kB)

    |██ ██| 132 kB 39.8 MB/s

Requirement already satisfied: pandas in /usr/local/lib/python3.7/dis t-packages (from watson-machine-learning-client) (1.3.5)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/di st-packages (from watson-machine-learning-client) (1.24.3)

Collecting ibm-cos-sdk

  Downloading ibm-cos-sdk-2.12.0.tar.gz (55 kB)

```
       |████████████████████████████████████████████████
██| 55 kB 4.8 MB/s
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-
packages (from watson-machine-learning-client) (4.64.1)
Collecting s3transfer<0.7.0,>=0.6.0
   Downloading s3transfer-0.6.0-py3-none-any.whl (79 kB)
       |████████████████████████████████████████████████
██| 79 kB 9.2 MB/s
Collecting botocore<1.30.0,>=1.29.8
   Downloading botocore-1.29.8-py3-none-any.whl (9.9 MB)
       |████████████████████████████████████████████████
██| 9.9 MB 53.6 MB/s
Collecting jmespath<2.0.0,>=0.7.1
   Downloading jmespath-1.0.1-py3-none-any.whl (20 kB)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from botocore<1.30.0,>=1.29.8->boto3
->watson-machine-learning-client) (2.8.2)
Collecting urllib3
   Downloading urllib3-1.26.12-py2.py3-none-any.whl (140 kB)
       |████████████████████████████████████████████████
██| 140 kB 59.3 MB/s
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.30.0,>=1.2
9.8->boto3->watson-machine-learning-client) (1.15.0)
Collecting ibm-cos-sdk-core==2.12.0
   Downloading ibm-cos-sdk-core-2.12.0.tar.gz (956 kB)
       |████████████████████████████████████████████████
██| 956 kB 54.0 MB/s
Collecting ibm-cos-sdk-s3transfer==2.12.0
   Downloading ibm-cos-sdk-s3transfer-2.12.0.tar.gz (135 kB)
       |████████████████████████████████████████████████
██| 135 kB 51.1 MB/s
Collecting jmespath<2.0.0,>=0.7.1
   Downloading jmespath-0.10.0-py2.py3-none-any.whl (24 kB)
Collecting requests
   Downloading requests-2.28.1-py3-none-any.whl (62 kB)
       |████████████████████████████████████████████████
██| 62 kB 1.4 MB/s
```

Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->watson-machine-learning-
client) (2.1.1)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->watson-machine-learning-client) (2.10)

Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas->watson-machine-learning-client) (2022.6)

Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas->watson-machine-learning-client) (1.21.
6)

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core,
 ibm-cos-sdk-s3transfer

  Building wheel for ibm-cos-sdk (setup.py) ... done

  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.12.0-py3-none
-any.whl size=73931 sha256=5d002be559f85f7e6ef7c2b32b1898204772912156
72a0c2ba61eb4944fb902c

  Stored in directory: /root/.cache/pip/wheels/ec/94/29/2b57327cf0066
4b6614304f7958abd29d77ea0e5bbece2ea57

  Building wheel for ibm-cos-sdk-core (setup.py) ... done

  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.12.
0-py3-none-any.whl size=562962 sha256=898299ee401f79fd8ad67a1115474b8
4f8bde2c5a4dfc4d9bf146ae727ab2c33

  Stored in directory: /root/.cache/pip/wheels/64/56/fb/5cd6f4f40406c
828a5289b95b2752a4d142a9afb359244ed8d

  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done

  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3tr
ansfer-2.12.0-py3-none-any.whl size=89778 sha256=87cd52eb26669ea97269
f11a6119523adac3c132633f3f52496ee0df122daa56

  Stored in directory: /root/.cache/pip/wheels/57/79/6a/ffe3370ed7ebc
00604f9f76766e1e0348dcdcad2b2e32df9e1

Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfe
r

Installing collected packages: urllib3, requests, jmespath, ibm-cos-s
dk-core, botocore, s3transfer, ibm-cos-sdk-s3transfer, lomond, ibm-co
s-sdk, boto3, watson-machine-learning-client

  Attempting uninstall: urllib3

    Found existing installation: urllib3 1.24.3

    Uninstalling urllib3-1.24.3:

      Successfully uninstalled urllib3-1.24.3

```
  Attempting uninstall: requests
    Found existing installation: requests 2.23.0
    Uninstalling requests-2.23.0:
      Successfully uninstalled requests-2.23.0
Successfully installed boto3-1.26.8 botocore-1.29.8 ibm-cos-sdk-2.12.
0 ibm-cos-sdk-core-2.12.0 ibm-cos-sdk-s3transfer-2.12.0 jmespath-0.10.
0 lomond-0.3.3 requests-2.28.1 s3transfer-0.6.0 urllib3-1.26.12 watso
n-machine-learning-client-1.0.391
```

```
!pip install ibm_watson_machine_learning
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.de
v/colab-wheels/public/simple/
```

```
Collecting ibm_watson_machine_learning
  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.
8 MB)
     |████████████████████████████████████████████████
██| 1.8 MB 6.3 MB/s
```

```
Requirement already satisfied: packaging in /usr/local/lib/python3.7/
dist-packages (from ibm_watson_machine_learning) (21.3)
```

```
Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (1.26.12)
```

```
Requirement already satisfied: certifi in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (2022.9.24)
```

```
Requirement already satisfied: importlib-metadata in /usr/local/lib/p
ython3.7/dist-packages (from ibm_watson_machine_learning) (4.13.0)
```

```
Requirement already satisfied: lomond in /usr/local/lib/python3.7/dis
t-packages (from ibm_watson_machine_learning) (0.3.3)
```

```
Requirement already satisfied: requests in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (2.28.1)
```

```
Collecting ibm-cos-sdk==2.7.*
  Downloading ibm-cos-sdk-2.7.0.tar.gz (51 kB)
     |████████████████████████████████████████████████
██| 51 kB 902 kB/s
```

```
Requirement already satisfied: tabulate in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (0.8.10)
```

```
Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /usr/local/li
b/python3.7/dist-packages (from ibm_watson_machine_learning) (1.3.5)
```

```
Collecting ibm-cos-sdk-core==2.7.0
  Downloading ibm-cos-sdk-core-2.7.0.tar.gz (824 kB)
```

██
■| 824 kB 50.2 MB/s
Collecting ibm-cos-sdk-s3transfer==2.7.0
  Downloading ibm-cos-sdk-s3transfer-2.7.0.tar.gz (133 kB)
██
■| 133 kB 57.0 MB/s
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /usr/local/l
ib/python3.7/dist-packages (from ibm-cos-sdk==2.7.*->ibm_watson_machi
ne_learning) (0.10.0)
Collecting docutils<0.16,>=0.10
  Downloading docutils-0.15.2-py3-none-any.whl (547 kB)
██
■| 547 kB 48.1 MB/s
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0->ibm-co
s-sdk==2.7.*->ibm_watson_machine_learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_learn
ing) (2022.6)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_lea
rning) (1.21.6)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.7.
0->ibm-cos-sdk==2.7.*->ibm_watson_machine_learning) (1.15.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->ibm_watson_machine_learning) (2.10)
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learn
ing) (2.1.1)
Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local
/lib/python3.7/dist-packages (from importlib-metadata->ibm_watson_mac
hine_learning) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/
dist-packages (from importlib-metadata->ibm_watson_machine_learning)
(3.10.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /usr/local
/lib/python3.7/dist-packages (from packaging->ibm_watson_machine_lear
ning) (3.0.9)

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer

Building wheel for ibm-cos-sdk (setup.py) ... done

Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.7.0-py2.py3-none-any.whl size=72563 sha256=85acfdaf3f232b65d3165854c3cf4651cc494f01dc7874276f118863e97fcf8c

Stored in directory: /root/.cache/pip/wheels/47/22/bf/e1154ff0f5de93cc477acd0ca69abfbb8b799c5b28a66b44c2

Building wheel for ibm-cos-sdk-core (setup.py) ... done

Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.7.0-py2.py3-none-any.whl size=501013 sha256=dfdd3d79b764119c0dfbc72b7436f7523e387abbbde90178014432a4d0dbbd1c

Stored in directory: /root/.cache/pip/wheels/6c/a2/e4/c16d02f809a3ea998e17cfd02c13369281f3d232aaf5902c19

Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done

Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3transfer-2.7.0-py2.py3-none-any.whl size=88622 sha256=d873231166da3e2723cdd9e44570258db0735b07a5f7c505365cbdb0f8cb74be

Stored in directory: /root/.cache/pip/wheels/5f/b7/14/fbe02bc1ef1af890650c7e51743d1c83890852e598d164b9da

Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfer

Installing collected packages: docutils, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer, ibm-cos-sdk, ibm-watson-machine-learning

Attempting uninstall: docutils

Found existing installation: docutils 0.17.1

Uninstalling docutils-0.17.1:

Successfully uninstalled docutils-0.17.1

Attempting uninstall: ibm-cos-sdk-core

Found existing installation: ibm-cos-sdk-core 2.12.0

Uninstalling ibm-cos-sdk-core-2.12.0:

Successfully uninstalled ibm-cos-sdk-core-2.12.0

Attempting uninstall: ibm-cos-sdk-s3transfer

Found existing installation: ibm-cos-sdk-s3transfer 2.12.0

Uninstalling ibm-cos-sdk-s3transfer-2.12.0:

Successfully uninstalled ibm-cos-sdk-s3transfer-2.12.0

Attempting uninstall: ibm-cos-sdk

Found existing installation: ibm-cos-sdk 2.12.0

```
    Uninstalling ibm-cos-sdk-2.12.0:
      Successfully uninstalled ibm-cos-sdk-2.12.0
Successfully installed docutils-0.15.2 ibm-cos-sdk-2.7.0 ibm-cos-sdk-
core-2.7.0 ibm-cos-sdk-s3transfer-2.7.0 ibm-watson-machine-learning-1.
0.257
```

In [ ]:

```python
from ibm_watson_machine_learning import APIClient
cloud_credentials={
    "url":"https://eu-gb.ml.cloud.ibm.com",
    "apikey":"JjbZw3a4R8S9m1hkHRzyhox5pPW_15Cc39WxdpFYy_eA"}
client=APIClient(cloud_credentials)
```

Python 3.7 and 3.8 frameworks are deprecated and will be removed in a
future release. Use Python 3.9 framework instead.

In [ ]:

```python
client.spaces.get_details()
```

Out[ ]:

```
{'resources': [{'entity': {'compute': [{'crn': 'crn:v1:bluemix:public:
pm-20:eu-gb:a/baf2fc8d7ee845f0b6f7ac004c72284e:66c03ce9-a400-4357-896
3-42f65995d1d6::',
      'guid': '66c03ce9-a400-4357-8963-42f65995d1d6',
      'name': 'Watson Machine Learning-oy',
      'type': 'machine_learning'}],
    'description': '',
    'name': 'realtime_deploy',
    'scope': {'bss_account_id': 'baf2fc8d7ee845f0b6f7ac004c72284e'},
    'stage': {'production': False},
    'status': {'state': 'active'},
    'storage': {'properties': {'bucket_name': 'ea8ff2b0-81e6-4923-aa7
8-fe4cbe1dcd18',
      'bucket_region': 'eu-gb-standard',
      'credentials': {'admin': {'access_key_id': 'e999e8ed9ad2445ca88
ae10af451d567',
        'api_key': 'fkP3B06ykhgejJJwiaTEmtxAjRznQ1cnQoFxw6ZYhi2q',
        'secret_access_key': '3148c14f7dfbe93c803cd44ab7906253620836f
95549b74f',
        'service_id': 'ServiceId-a8d83975-cb8a-45b6-8a0b-2ef8c5e46143
'},
```

        'editor': {'access_key_id': 'f024630ce04d42339708fac182f0ab39',
        'api_key': 'mcCE4FeS7xgQJkxKtxFFqWepQy8KM4G1SCVBCSN-fwUj',
        'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
        'secret_access_key': '7153814f9855ae7da467ce49bbfcfbbac827584
02be72ecb',
        'service_id': 'ServiceId-c681d0d0-1da1-4b75-a76e-966b2d01ac94
'},
        'viewer': {'access_key_id': '3a85fecc33094296a617c4fb8671a6a8',
        'api_key': 'h7Q07ClgcxsXIiQxTxqrz0810f0RSup70bHe1CsAsueb',
        'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
        'secret_access_key': '402f3531b91713996a937d5d03b47f6dc8f1392
371275b8a',
        'service_id': 'ServiceId-f4cdb334-b0d8-4f02-9cff-ffb579be7ad9
'}},
        'endpoint_url': 'https://s3.eu-gb.cloud-object-storage.appdomai
n.cloud',
        'guid': 'b3296065-0e0c-41e2-94ef-9ce2d0f52335',
        'resource_crn': 'crn:v1:bluemix:public:cloud-object-storage:glo
bal:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-9ce2d0
f52335::'},
     'type': 'bmcos_object_storage'}},
   'metadata': {'created_at': '2022-11-12T08:02:21.536Z',
    'creator_id': 'IBMid-663003YGW8',
    'id': '4afa8b26-897b-4309-b86e-5a89d939e183',
    'updated_at': '2022-11-12T08:02:35.769Z',
    'url': '/v2/spaces/4afa8b26-897b-4309-b86e-5a89d939e183'}}]]}

In [ ]:

space_uid='4afa8b26-897b-4309-b86e-5a89d939e183' space_uid

Out[ ]:

'4afa8b26-897b-4309-b86e-5a89d939e183'

In [ ]:

client.set.default_space(space_uid)

Out[ ]:

'SUCCESS'

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

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

```
model_details=client.repository.store_model(model='realtime.tgz',me
ta_props={
    client.repository.ModelMetaNames.NAME:"REALTIME_CLOUD",
    client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",

client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_space_u
id})
```

```
model_details
```

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'software_spec': {'id': 'acd9c798-6974-5d2f-a657-ce06e986df4d',
   'name': 'tensorflow_rt22.1-py3.9'},
  'type': 'tensorflow_2.7'},
 'metadata': {'created_at': '2022-11-12T08:27:11.689Z',
  'id': '1966b2e6-917e-402f-9587-bfaca4a14953',
  'modified_at': '2022-11-12T08:27:17.972Z',
  'name': 'REALTIME_CLOUD',
  'owner': 'IBMid-663003YGW8',
  'resource_key': '46bcf134-f27f-4620-a04e-8b9798c79b9a',
  'space_id': '4afa8b26-897b-4309-b86e-5a89d939e183'},
 'system': {'warnings': []}}
```

```
model_id=client.repository.get_model_id(model_details)model_id
```

```
'1966b2e6-917e-402f-9587-bfaca4a14953'
```

```
client.repository.download(model_id,'REALTIME_CLOUD.tar.gb')
Successfully saved model content to file: 'REALTIME_CLOUD.tar.gb'
```

'/content/REALTIME_CLOUD.tar.gb'

SAVING THE MODEL

*#saving the model*model.save('realtime.h5')

#converting to tar!tar -zcvf realtime.tgz realtime.h5

realtime.h5

CLOUD DEPLOYMENT

!pip install watson-machine-learning-client

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/

Collecting watson-machine-learning-client

  Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)

     |██| 538 kB 7.3 MB/s

Requirement already satisfied: requests in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (2.23.0)

Collecting lomond

  Downloading lomond-0.3.3-py2.py3-none-any.whl (35 kB)

Requirement already satisfied: tabulate in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (0.8.10)

Requirement already satisfied: certifi in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (2022.9.24)

Collecting boto3

  Downloading boto3-1.26.8-py3-none-any.whl (132 kB)

     |██| 132 kB 39.8 MB/s

Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (1.3.5)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/dist-packages (from watson-machine-learning-client) (1.24.3)

Collecting ibm-cos-sdk

  Downloading ibm-cos-sdk-2.12.0.tar.gz (55 kB)

```
      |████████████████████████████████████████████
██|  55 kB 4.8 MB/s
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-
packages (from watson-machine-learning-client) (4.64.1)
Collecting s3transfer<0.7.0,>=0.6.0
  Downloading s3transfer-0.6.0-py3-none-any.whl (79 kB)
      |████████████████████████████████████████████
██|  79 kB 9.2 MB/s
Collecting botocore<1.30.0,>=1.29.8
  Downloading botocore-1.29.8-py3-none-any.whl (9.9 MB)
      |████████████████████████████████████████████
██|  9.9 MB 53.6 MB/s
Collecting jmespath<2.0.0,>=0.7.1
  Downloading jmespath-1.0.1-py3-none-any.whl (20 kB)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from botocore<1.30.0,>=1.29.8->boto3
->watson-machine-learning-client) (2.8.2)
Collecting urllib3
  Downloading urllib3-1.26.12-py2.py3-none-any.whl (140 kB)
      |████████████████████████████████████████████
██|  140 kB 59.3 MB/s
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.30.0,>=1.2
9.8->boto3->watson-machine-learning-client) (1.15.0)
Collecting ibm-cos-sdk-core==2.12.0
  Downloading ibm-cos-sdk-core-2.12.0.tar.gz (956 kB)
      |████████████████████████████████████████████
██|  956 kB 54.0 MB/s
Collecting ibm-cos-sdk-s3transfer==2.12.0
  Downloading ibm-cos-sdk-s3transfer-2.12.0.tar.gz (135 kB)
      |████████████████████████████████████████████
██|  135 kB 51.1 MB/s
Collecting jmespath<2.0.0,>=0.7.1
  Downloading jmespath-0.10.0-py2.py3-none-any.whl (24 kB)
Collecting requests
  Downloading requests-2.28.1-py3-none-any.whl (62 kB)
      |████████████████████████████████████████████
██|  62 kB 1.4 MB/s
```

Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local /lib/python3.7/dist-packages (from requests->watson-machine-learning- client) (2.1.1)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3. 7/dist-packages (from requests->watson-machine-learning-client) (2.10)

Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3. 7/dist-packages (from pandas->watson-machine-learning-client) (2022.6)

Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python 3.7/dist-packages (from pandas->watson-machine-learning-client) (1.21. 6)

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer

  Building wheel for ibm-cos-sdk (setup.py) ... done

  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.12.0-py3-none -any.whl size=73931 sha256=5d002be559f85f7e6ef7c2b32b1898204772912156 72a0c2ba61eb4944fb902c

  Stored in directory: /root/.cache/pip/wheels/ec/94/29/2b57327cf0066 4b6614304f7958abd29d77ea0e5bbece2ea57

  Building wheel for ibm-cos-sdk-core (setup.py) ... done

  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.12. 0-py3-none-any.whl size=562962 sha256=898299ee401f79fd8ad67a1115474b8 4f8bde2c5a4dfc4d9bf146ae727ab2c33

  Stored in directory: /root/.cache/pip/wheels/64/56/fb/5cd6f4f40406c 828a5289b95b2752a4d142a9afb359244ed8d

  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done

  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3tr ansfer-2.12.0-py3-none-any.whl size=89778 sha256=87cd52eb26669ea97269 f11a6119523adac3c132633f3f52496ee0df122daa56

  Stored in directory: /root/.cache/pip/wheels/57/79/6a/ffe3370ed7ebc 00604f9f76766e1e0348dcdcad2b2e32df9e1

Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfe r

Installing collected packages: urllib3, requests, jmespath, ibm-cos-s dk-core, botocore, s3transfer, ibm-cos-sdk-s3transfer, lomond, ibm-co s-sdk, boto3, watson-machine-learning-client

  Attempting uninstall: urllib3

    Found existing installation: urllib3 1.24.3

    Uninstalling urllib3-1.24.3:

      Successfully uninstalled urllib3-1.24.3

```
    Attempting uninstall: requests
      Found existing installation: requests 2.23.0
      Uninstalling requests-2.23.0:
        Successfully uninstalled requests-2.23.0
Successfully installed boto3-1.26.8 botocore-1.29.8 ibm-cos-sdk-2.12.
0 ibm-cos-sdk-core-2.12.0 ibm-cos-sdk-s3transfer-2.12.0 jmespath-0.10.
0 lomond-0.3.3 requests-2.28.1 s3transfer-0.6.0 urllib3-1.26.12 watso
n-machine-learning-client-1.0.391
```

```
!pip install ibm_watson_machine_learning
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.de
v/colab-wheels/public/simple/
```

```
Collecting ibm_watson_machine_learning
  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.
8 MB)
    |████████████████████████████████████████████████
█| 1.8 MB 6.3 MB/s
```

```
Requirement already satisfied: packaging in /usr/local/lib/python3.7/
dist-packages (from ibm_watson_machine_learning) (21.3)
```

```
Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (1.26.12)
```

```
Requirement already satisfied: certifi in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (2022.9.24)
```

```
Requirement already satisfied: importlib-metadata in /usr/local/lib/p
ython3.7/dist-packages (from ibm_watson_machine_learning) (4.13.0)
```

```
Requirement already satisfied: lomond in /usr/local/lib/python3.7/dis
t-packages (from ibm_watson_machine_learning) (0.3.3)
```

```
Requirement already satisfied: requests in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (2.28.1)
```

```
Collecting ibm-cos-sdk==2.7.*
  Downloading ibm-cos-sdk-2.7.0.tar.gz (51 kB)
    |████████████████████████████████████████████████
█| 51 kB 902 kB/s
```

```
Requirement already satisfied: tabulate in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (0.8.10)
```

```
Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /usr/local/li
b/python3.7/dist-packages (from ibm_watson_machine_learning) (1.3.5)
```

```
Collecting ibm-cos-sdk-core==2.7.0
  Downloading ibm-cos-sdk-core-2.7.0.tar.gz (824 kB)
```

```
        |███████████████████████████████████████████
■| 824 kB 50.2 MB/s
Collecting ibm-cos-sdk-s3transfer==2.7.0
  Downloading ibm-cos-sdk-s3transfer-2.7.0.tar.gz (133 kB)
        |███████████████████████████████████████████
■| 133 kB 57.0 MB/s
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /usr/local/l
ib/python3.7/dist-packages (from ibm-cos-sdk==2.7.*->ibm_watson_machi
ne_learning) (0.10.0)
Collecting docutils<0.16,>=0.10
  Downloading docutils-0.15.2-py3-none-any.whl (547 kB)
        |███████████████████████████████████████████
■| 547 kB 48.1 MB/s
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0->ibm-co
s-sdk==2.7.*->ibm_watson_machine_learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_learn
ing) (2022.6)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_lea
rning) (1.21.6)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.7.
0->ibm-cos-sdk==2.7.*->ibm_watson_machine_learning) (1.15.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->ibm_watson_machine_learning) (2.10)
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learn
ing) (2.1.1)
Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local
/lib/python3.7/dist-packages (from importlib-metadata->ibm_watson_mac
hine_learning) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/
dist-packages (from importlib-metadata->ibm_watson_machine_learning)
(3.10.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /usr/local
/lib/python3.7/dist-packages (from packaging->ibm_watson_machine_lear
ning) (3.0.9)
```

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer
  Building wheel for ibm-cos-sdk (setup.py) ... done
  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.7.0-py2.py3-none-any.whl size=72563 sha256=85acfdaf3f232b65d3165854c3cf4651cc494f01dc7874276f118863e97fcf8c
  Stored in directory: /root/.cache/pip/wheels/47/22/bf/e1154ff0f5de93cc477acd0ca69abfbb8b799c5b28a66b44c2
  Building wheel for ibm-cos-sdk-core (setup.py) ... done
  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.7.0-py2.py3-none-any.whl size=501013 sha256=dfdd3d79b764119c0dfbc72b7436f7523e387abbbde90178014432a4d0dbbd1c
  Stored in directory: /root/.cache/pip/wheels/6c/a2/e4/c16d02f809a3ea998e17cfd02c13369281f3d232aaf5902c19
  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done
  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3transfer-2.7.0-py2.py3-none-any.whl size=88622 sha256=d873231166da3e2723cdd9e44570258db0735b07a5f7c505365cbdb0f8cb74be
  Stored in directory: /root/.cache/pip/wheels/5f/b7/14/fbe02bc1ef1af890650c7e51743d1c83890852e598d164b9da
Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfer
Installing collected packages: docutils, ibm-cos-sdk-core, ibm-cos-sdk-s3transfer, ibm-cos-sdk, ibm-watson-machine-learning
  Attempting uninstall: docutils
    Found existing installation: docutils 0.17.1
    Uninstalling docutils-0.17.1:
      Successfully uninstalled docutils-0.17.1
  Attempting uninstall: ibm-cos-sdk-core
    Found existing installation: ibm-cos-sdk-core 2.12.0
    Uninstalling ibm-cos-sdk-core-2.12.0:
      Successfully uninstalled ibm-cos-sdk-core-2.12.0
  Attempting uninstall: ibm-cos-sdk-s3transfer
    Found existing installation: ibm-cos-sdk-s3transfer 2.12.0
    Uninstalling ibm-cos-sdk-s3transfer-2.12.0:
      Successfully uninstalled ibm-cos-sdk-s3transfer-2.12.0
  Attempting uninstall: ibm-cos-sdk
    Found existing installation: ibm-cos-sdk 2.12.0

```
    Uninstalling ibm-cos-sdk-2.12.0:
       Successfully uninstalled ibm-cos-sdk-2.12.0
Successfully installed docutils-0.15.2 ibm-cos-sdk-2.7.0 ibm-cos-sdk-
core-2.7.0 ibm-cos-sdk-s3transfer-2.7.0 ibm-watson-machine-learning-1.
0.257
```

In [ ]:

```python
from ibm_watson_machine_learning import APIClient
cloud_credentials={
    "url":"https://eu-gb.ml.cloud.ibm.com",
    "apikey":"JjbZw3a4R8S9m1hkHRzyhox5pPW_15Cc39WxdpFYy_eA"}
client=APIClient(cloud_credentials)
```

Python 3.7 and 3.8 frameworks are deprecated and will be removed in a
future release. Use Python 3.9 framework instead.

In [ ]:

```python
client.spaces.get_details()
```

Out[ ]:

```
{'resources': [{'entity': {'compute': [{'crn': 'crn:v1:bluemix:public:
pm-20:eu-gb:a/baf2fc8d7ee845f0b6f7ac004c72284e:66c03ce9-a400-4357-896
3-42f65995d1d6::',
       'guid': '66c03ce9-a400-4357-8963-42f65995d1d6',
       'name': 'Watson Machine Learning-oy',
       'type': 'machine_learning'}],
    'description': '',
    'name': 'realtime_deploy',
    'scope': {'bss_account_id': 'baf2fc8d7ee845f0b6f7ac004c72284e'},
    'stage': {'production': False},
    'status': {'state': 'active'},
    'storage': {'properties': {'bucket_name': 'ea8ff2b0-81e6-4923-aa7
8-fe4cbe1dcd18',
       'bucket_region': 'eu-gb-standard',
       'credentials': {'admin': {'access_key_id': 'e999e8ed9ad2445ca88
ae10af451d567',
          'api_key': 'fkP3BO6ykhgejJJwiaTEmtxAjRznQlcnQoFxw6ZYhi2q',
          'secret_access_key': '3148c14f7dfbe93c803cd44ab7906253620836f
95549b74f',
          'service_id': 'ServiceId-a8d83975-cb8a-45b6-8a0b-2ef8c5e46143
'},
```

'editor': {'access_key_id': 'f024630ce04d42339708fac182f0ab39',
  'api_key': 'mcCE4FeS7xgQJkxKtxFFqWepQy8KM4GlSCVBCSN-fwUj',
  'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
  'secret_access_key': '7153814f9855ae7da467ce49bbfcfbbac827584
02be72ecb',
  'service_id': 'ServiceId-c681d0d0-1da1-4b75-a76e-966b2d01ac94
'},
  'viewer': {'access_key_id': '3a85fecc33094296a617c4fb8671a6a8',
  'api_key': 'h7Q07ClgcxsXIiQxTxqrz0810f0RSup70bHelCsAsueb',
  'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
  'secret_access_key': '402f3531b91713996a937d5d03b47f6dc8f1392
371275b8a',
  'service_id': 'ServiceId-f4cdb334-b0d8-4f02-9cff-ffb579be7ad9
'}},
  'endpoint_url': 'https://s3.eu-gb.cloud-object-storage.appdomai
n.cloud',
  'guid': 'b3296065-0e0c-41e2-94ef-9ce2d0f52335',
  'resource_crn': 'crn:v1:bluemix:public:cloud-object-storage:glo
bal:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-9ce2d0
f52335::'},
  'type': 'bmcos_object_storage'}},
  'metadata': {'created_at': '2022-11-12T08:02:21.536Z',
  'creator_id': 'IBMid-663003YGW8',
  'id': '4afa8b26-897b-4309-b86e-5a89d939e183',
  'updated_at': '2022-11-12T08:02:35.769Z',
  'url': '/v2/spaces/4afa8b26-897b-4309-b86e-5a89d939e183'}}]]}

In [ ]:

```
space_uid='4afa8b26-897b-4309-b86e-5a89d939e183' space_uid
```

Out[ ]:

'4afa8b26-897b-4309-b86e-5a89d939e183'

In [ ]:

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

Out[ ]:

'SUCCESS'

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

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

```
model_details=client.repository.store_model(model='realtime.tgz',me
ta_props={
    client.repository.ModelMetaNames.NAME:"REALTIME_CLOUD",
    client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",

client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_space_u
id})
```

```
model_details
```

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'software_spec': {'id': 'acd9c798-6974-5d2f-a657-ce06e986df4d',
   'name': 'tensorflow_rt22.1-py3.9'},
  'type': 'tensorflow_2.7'},
 'metadata': {'created_at': '2022-11-12T08:27:11.689Z',
  'id': '1966b2e6-917e-402f-9587-bfaca4a14953',
  'modified_at': '2022-11-12T08:27:17.972Z',
  'name': 'REALTIME_CLOUD',
  'owner': 'IBMid-663003YGW8',
  'resource_key': '46bcf134-f27f-4620-a04e-8b9798c79b9a',
  'space_id': '4afa8b26-897b-4309-b86e-5a89d939e183'},
 'system': {'warnings': []}}
```

```
model_id=client.repository.get_model_id(model_details)model_id
```

```
'1966b2e6-917e-402f-9587-bfaca4a14953'
```

```
client.repository.download(model_id,'REALTIME_CLOUD.tar.gb')
Successfully saved model content to file: 'REALTIME_CLOUD.tar.gb'
```

'/content/REALTIME_CLOUD.tar.gb'

SAVING THE MODEL

*#saving the model*model.save('realtime.h5')

#converting to tar!tar -zcvf realtime.tgz realtime.h5

realtime.h5

CLOUD DEPLOYMENT

!pip install watson-machine-learning-client

Looking in indexes: https://pypi.org/simple, https://us-python.pkg.de
v/colab-wheels/public/simple/

Collecting watson-machine-learning-client

  Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl
  (538 kB)

      |██
██| 538 kB 7.3 MB/s

Requirement already satisfied: requests in /usr/local/lib/python3.7/d
ist-packages (from watson-machine-learning-client) (2.23.0)

Collecting lomond

  Downloading lomond-0.3.3-py2.py3-none-any.whl (35 kB)

Requirement already satisfied: tabulate in /usr/local/lib/python3.7/d
ist-packages (from watson-machine-learning-client) (0.8.10)

Requirement already satisfied: certifi in /usr/local/lib/python3.7/di
st-packages (from watson-machine-learning-client) (2022.9.24)

Collecting boto3

  Downloading boto3-1.26.8-py3-none-any.whl (132 kB)

      |███
██| 132 kB 39.8 MB/s

Requirement already satisfied: pandas in /usr/local/lib/python3.7/dis
t-packages (from watson-machine-learning-client) (1.3.5)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/di
st-packages (from watson-machine-learning-client) (1.24.3)

Collecting ibm-cos-sdk

  Downloading ibm-cos-sdk-2.12.0.tar.gz (55 kB)

```
     |████████████████████████████████████████████
██| 55 kB 4.8 MB/s
Requirement already satisfied: tqdm in /usr/local/lib/python3.7/dist-
packages (from watson-machine-learning-client) (4.64.1)
Collecting s3transfer<0.7.0,>=0.6.0
   Downloading s3transfer-0.6.0-py3-none-any.whl (79 kB)
     |████████████████████████████████████████████
██| 79 kB 9.2 MB/s
Collecting botocore<1.30.0,>=1.29.8
   Downloading botocore-1.29.8-py3-none-any.whl (9.9 MB)
     |████████████████████████████████████████████
██| 9.9 MB 53.6 MB/s
Collecting jmespath<2.0.0,>=0.7.1
   Downloading jmespath-1.0.1-py3-none-any.whl (20 kB)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from botocore<1.30.0,>=1.29.8->boto3
->watson-machine-learning-client) (2.8.2)
Collecting urllib3
   Downloading urllib3-1.26.12-py2.py3-none-any.whl (140 kB)
     |████████████████████████████████████████████
██| 140 kB 59.3 MB/s
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.30.0,>=1.2
9.8->boto3->watson-machine-learning-client) (1.15.0)
Collecting ibm-cos-sdk-core==2.12.0
   Downloading ibm-cos-sdk-core-2.12.0.tar.gz (956 kB)
     |████████████████████████████████████████████
██| 956 kB 54.0 MB/s
Collecting ibm-cos-sdk-s3transfer==2.12.0
   Downloading ibm-cos-sdk-s3transfer-2.12.0.tar.gz (135 kB)
     |████████████████████████████████████████████
██| 135 kB 51.1 MB/s
Collecting jmespath<2.0.0,>=0.7.1
   Downloading jmespath-0.10.0-py2.py3-none-any.whl (24 kB)
Collecting requests
   Downloading requests-2.28.1-py3-none-any.whl (62 kB)
     |████████████████████████████████████████████
██| 62 kB 1.4 MB/s
```

Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->watson-machine-learning-
client) (2.1.1)

Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->watson-machine-learning-client) (2.10)

Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas->watson-machine-learning-client) (2022.6)

Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas->watson-machine-learning-client) (1.21.
6)

Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core,
 ibm-cos-sdk-s3transfer

  Building wheel for ibm-cos-sdk (setup.py) ... done

  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.12.0-py3-none
-any.whl size=73931 sha256=5d002be559f85f7e6ef7c2b32b1898204772912156
72a0c2ba61eb4944fb902c

  Stored in directory: /root/.cache/pip/wheels/ec/94/29/2b57327cf0066
4b6614304f7958abd29d77ea0e5bbece2ea57

  Building wheel for ibm-cos-sdk-core (setup.py) ... done

  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.12.
0-py3-none-any.whl size=562962 sha256=898299ee401f79fd8ad67a1115474b8
4f8bde2c5a4dfc4d9bf146ae727ab2c33

  Stored in directory: /root/.cache/pip/wheels/64/56/fb/5cd6f4f40406c
828a5289b95b2752a4d142a9afb359244ed8d

  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done

  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3tr
ansfer-2.12.0-py3-none-any.whl size=89778 sha256=87cd52eb26669ea97269
f11a6119523adac3c132633f3f52496ee0df122daa56

  Stored in directory: /root/.cache/pip/wheels/57/79/6a/ffe3370ed7ebc
00604f9f76766e1e0348dcdcad2b2e32df9e1

Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfe
r

Installing collected packages: urllib3, requests, jmespath, ibm-cos-s
dk-core, botocore, s3transfer, ibm-cos-sdk-s3transfer, lomond, ibm-co
s-sdk, boto3, watson-machine-learning-client

  Attempting uninstall: urllib3

    Found existing installation: urllib3 1.24.3

    Uninstalling urllib3-1.24.3:

      Successfully uninstalled urllib3-1.24.3

```
  Attempting uninstall: requests
    Found existing installation: requests 2.23.0
    Uninstalling requests-2.23.0:
      Successfully uninstalled requests-2.23.0
Successfully installed boto3-1.26.8 botocore-1.29.8 ibm-cos-sdk-2.12.
0 ibm-cos-sdk-core-2.12.0 ibm-cos-sdk-s3transfer-2.12.0 jmespath-0.10.
0 lomond-0.3.3 requests-2.28.1 s3transfer-0.6.0 urllib3-1.26.12 watso
n-machine-learning-client-1.0.391
```

```
!pip install ibm_watson_machine_learning
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.de
v/colab-wheels/public/simple/
```

```
Collecting ibm_watson_machine_learning
  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.
8 MB)
     |████████████████████████████████████████████████████
██| 1.8 MB 6.3 MB/s
```

```
Requirement already satisfied: packaging in /usr/local/lib/python3.7/
dist-packages (from ibm_watson_machine_learning) (21.3)
```

```
Requirement already satisfied: urllib3 in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (1.26.12)
```

```
Requirement already satisfied: certifi in /usr/local/lib/python3.7/di
st-packages (from ibm_watson_machine_learning) (2022.9.24)
```

```
Requirement already satisfied: importlib-metadata in /usr/local/lib/p
ython3.7/dist-packages (from ibm_watson_machine_learning) (4.13.0)
```

```
Requirement already satisfied: lomond in /usr/local/lib/python3.7/dis
t-packages (from ibm_watson_machine_learning) (0.3.3)
```

```
Requirement already satisfied: requests in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (2.28.1)
```

```
Collecting ibm-cos-sdk==2.7.*
  Downloading ibm-cos-sdk-2.7.0.tar.gz (51 kB)
     |████████████████████████████████████████████████████
██| 51 kB 902 kB/s
```

```
Requirement already satisfied: tabulate in /usr/local/lib/python3.7/d
ist-packages (from ibm_watson_machine_learning) (0.8.10)
```

```
Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /usr/local/li
b/python3.7/dist-packages (from ibm_watson_machine_learning) (1.3.5)
```

```
Collecting ibm-cos-sdk-core==2.7.0
  Downloading ibm-cos-sdk-core-2.7.0.tar.gz (824 kB)
```

```
       |████████████████████████████████████████████
██| 824 kB 50.2 MB/s
Collecting ibm-cos-sdk-s3transfer==2.7.0
  Downloading ibm-cos-sdk-s3transfer-2.7.0.tar.gz (133 kB)
       |████████████████████████████████████████████
██| 133 kB 57.0 MB/s
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /usr/local/l
ib/python3.7/dist-packages (from ibm-cos-sdk==2.7.*->ibm_watson_machi
ne_learning) (0.10.0)
Collecting docutils<0.16,>=0.10
  Downloading docutils-0.15.2-py3-none-any.whl (547 kB)
       |████████████████████████████████████████████
██| 547 kB 48.1 MB/s
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/lo
cal/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0->ibm-co
s-sdk==2.7.*->ibm_watson_machine_learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.
7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_learn
ing) (2022.6)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python
3.7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_machine_lea
rning) (1.21.6)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/d
ist-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.7.
0->ibm-cos-sdk==2.7.*->ibm_watson_machine_learning) (1.15.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.
7/dist-packages (from requests->ibm_watson_machine_learning) (2.10)
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local
/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learn
ing) (2.1.1)
Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local
/lib/python3.7/dist-packages (from importlib-metadata->ibm_watson_mac
hine_learning) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/
dist-packages (from importlib-metadata->ibm_watson_machine_learning)
(3.10.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /usr/local
/lib/python3.7/dist-packages (from packaging->ibm_watson_machine_lear
ning) (3.0.9)
```

```
Building wheels for collected packages: ibm-cos-sdk, ibm-cos-sdk-core,
 ibm-cos-sdk-s3transfer
  Building wheel for ibm-cos-sdk (setup.py) ... done
  Created wheel for ibm-cos-sdk: filename=ibm_cos_sdk-2.7.0-py2.py3-n
one-any.whl size=72563 sha256=85acfdaf3f232b65d3165854c3cf4651cc494f0
1dc7874276f118863e97fcf8c
  Stored in directory: /root/.cache/pip/wheels/47/22/bf/e1154ff0f5de9
3cc477acd0ca69abfbb8b799c5b28a66b44c2
  Building wheel for ibm-cos-sdk-core (setup.py) ... done
  Created wheel for ibm-cos-sdk-core: filename=ibm_cos_sdk_core-2.7.0
-py2.py3-none-any.whl size=501013 sha256=dfdd3d79b764119c0dfbc72b7436
f7523e387abbbde90178014432a4d0dbbd1c
  Stored in directory: /root/.cache/pip/wheels/6c/a2/e4/c16d02f809a3e
a998e17cfd02c13369281f3d232aaf5902c19
  Building wheel for ibm-cos-sdk-s3transfer (setup.py) ... done
  Created wheel for ibm-cos-sdk-s3transfer: filename=ibm_cos_sdk_s3tr
ansfer-2.7.0-py2.py3-none-any.whl size=88622 sha256=d873231166da3e272
3cdd9e44570258db0735b07a5f7c505365cbdb0f8cb74be
  Stored in directory: /root/.cache/pip/wheels/5f/b7/14/fbe02bc1ef1af
890650c7e51743d1c83890852e598d164b9da
Successfully built ibm-cos-sdk ibm-cos-sdk-core ibm-cos-sdk-s3transfe
r
Installing collected packages: docutils, ibm-cos-sdk-core, ibm-cos-sd
k-s3transfer, ibm-cos-sdk, ibm-watson-machine-learning
  Attempting uninstall: docutils
    Found existing installation: docutils 0.17.1
    Uninstalling docutils-0.17.1:
      Successfully uninstalled docutils-0.17.1
  Attempting uninstall: ibm-cos-sdk-core
    Found existing installation: ibm-cos-sdk-core 2.12.0
    Uninstalling ibm-cos-sdk-core-2.12.0:
      Successfully uninstalled ibm-cos-sdk-core-2.12.0
  Attempting uninstall: ibm-cos-sdk-s3transfer
    Found existing installation: ibm-cos-sdk-s3transfer 2.12.0
    Uninstalling ibm-cos-sdk-s3transfer-2.12.0:
      Successfully uninstalled ibm-cos-sdk-s3transfer-2.12.0
  Attempting uninstall: ibm-cos-sdk
    Found existing installation: ibm-cos-sdk 2.12.0
```

```
    Uninstalling ibm-cos-sdk-2.12.0:
      Successfully uninstalled ibm-cos-sdk-2.12.0
Successfully installed docutils-0.15.2 ibm-cos-sdk-2.7.0 ibm-cos-sdk-
core-2.7.0 ibm-cos-sdk-s3transfer-2.7.0 ibm-watson-machine-learning-1.
0.257
```

In [ ]:

```
from ibm_watson_machine_learning import APIClient
cloud_credentials={
    "url":"https://eu-gb.ml.cloud.ibm.com",
    "apikey":"JjbZw3a4R8S9m1hkHRzyhox5pPW_15Cc39WxdpFYy_eA"}
client=APIClient(cloud_credentials)
```

Python 3.7 and 3.8 frameworks are deprecated and will be removed in a
future release. Use Python 3.9 framework instead.

In [ ]:

```
client.spaces.get_details()
```

Out[ ]:

```
{'resources': [{'entity': {'compute': [{'crn': 'crn:v1:bluemix:public:
pm-20:eu-gb:a/baf2fc8d7ee845f0b6f7ac004c72284e:66c03ce9-a400-4357-896
3-42f65995d1d6::',
      'guid': '66c03ce9-a400-4357-8963-42f65995d1d6',
      'name': 'Watson Machine Learning-oy',
      'type': 'machine_learning'}],
   'description': '',
   'name': 'realtime_deploy',
   'scope': {'bss_account_id': 'baf2fc8d7ee845f0b6f7ac004c72284e'},
   'stage': {'production': False},
   'status': {'state': 'active'},
   'storage': {'properties': {'bucket_name': 'ea8ff2b0-81e6-4923-aa7
8-fe4cbe1dcd18',
      'bucket_region': 'eu-gb-standard',
      'credentials': {'admin': {'access_key_id': 'e999e8ed9ad2445ca88
ae10af451d567',
        'api_key': 'fkP3BO6ykhgejJJwiaTEmtxAjRznQ1cnQoFxw6ZYhi2q',
        'secret_access_key': '3148c14f7dfbe93c803cd44ab7906253620836f
95549b74f',
        'service_id': 'ServiceId-a8d83975-cb8a-45b6-8a0b-2ef8c5e46143
'},
```

'editor': {'access_key_id': 'f024630ce04d42339708fac182f0ab39',
        'api_key': 'mcCE4FeS7xgQJkxKtxFFqWepQy8KM4GlSCVBCSN-fwUj',
        'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
        'secret_access_key': '7153814f9855ae7da467ce49bbfcfbbac827584
02be72ecb',
        'service_id': 'ServiceId-c681d0d0-1da1-4b75-a76e-966b2d01ac94
'},
        'viewer': {'access_key_id': '3a85fecc33094296a617c4fb8671a6a8',
        'api_key': 'h7Q07ClgcxsXIiQxTxqrz0810f0RSup70bHelCsAsueb',
        'resource_key_crn': 'crn:v1:bluemix:public:cloud-object-stora
ge:global:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-
9ce2d0f52335::',
        'secret_access_key': '402f3531b91713996a937d5d03b47f6dc8f1392
371275b8a',
        'service_id': 'ServiceId-f4cdb334-b0d8-4f02-9cff-ffb579be7ad9
'}},
        'endpoint_url': 'https://s3.eu-gb.cloud-object-storage.appdomai
n.cloud',
        'guid': 'b3296065-0e0c-41e2-94ef-9ce2d0f52335',
        'resource_crn': 'crn:v1:bluemix:public:cloud-object-storage:glo
bal:a/baf2fc8d7ee845f0b6f7ac004c72284e:b3296065-0e0c-41e2-94ef-9ce2d0
f52335::'},
        'type': 'bmcos_object_storage'}},
    'metadata': {'created_at': '2022-11-12T08:02:21.536Z',
    'creator_id': 'IBMid-663003YGW8',
    'id': '4afa8b26-897b-4309-b86e-5a89d939e183',
    'updated_at': '2022-11-12T08:02:35.769Z',
    'url': '/v2/spaces/4afa8b26-897b-4309-b86e-5a89d939e183'}}]]}

In [ ]:

```
space_uid='4afa8b26-897b-4309-b86e-5a89d939e183' space_uid
```

Out[ ]:

'4afa8b26-897b-4309-b86e-5a89d939e183'

In [ ]:

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

Out[ ]:

'SUCCESS'

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

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

```
model_details=client.repository.store_model(model='realtime.tgz',me
ta_props={
    client.repository.ModelMetaNames.NAME:"REALTIME_CLOUD",
    client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",

client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_space_u
id})
```

```
model_details
```

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'software_spec': {'id': 'acd9c798-6974-5d2f-a657-ce06e986df4d',
   'name': 'tensorflow_rt22.1-py3.9'},
  'type': 'tensorflow_2.7'},
 'metadata': {'created_at': '2022-11-12T08:27:11.689Z',
  'id': '1966b2e6-917e-402f-9587-bfaca4a14953',
  'modified_at': '2022-11-12T08:27:17.972Z',
  'name': 'REALTIME_CLOUD',
  'owner': 'IBMid-663003YGW8',
  'resource_key': '46bcf134-f27f-4620-a04e-8b9798c79b9a',
  'space_id': '4afa8b26-897b-4309-b86e-5a89d939e183'},
 'system': {'warnings': []}}
```

```
model_id=client.repository.get_model_id(model_details)model_id
```

```
'1966b2e6-917e-402f-9587-bfaca4a14953'
```

```
client.repository.download(model_id,'REALTIME_CLOUD.tar.gb')
Successfully saved model content to file: 'REALTIME_CLOUD.tar.gb'
```

'/content/REALTIME_CLOUD.tar.gb'