Deploying the Model

```python
lr = pickle.load(open("university.pkl", "rb")) #logistic regression model
```

In [31]:

```
Requirement already satisfied: ibm-watson-machine-learning in /opt/conda/env
s/Python-3.9/lib/python3.9/site-packages (1.0.255)
Collecting ibm-watson-machine-learning
  Downloading ibm_watson_machine_learning-1.0.257-py3-none-any.whl (1.8 MB)
     |████████████████████████████████| 1.8 MB 25.6 MB/s eta 0:00:01
Requirement already satisfied: importlib-metadata in /opt/conda/envs/Python-
3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (4.8.2)
Requirement already satisfied: requests in /opt/conda/envs/Python-3.9/lib/pyt
hon3.9/site-packages (from ibm-watson-machine-learning) (2.26.0)
Requirement already satisfied: ibm-cos-sdk==2.11.* in /opt/conda/envs/Python-
3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (2.11.0)
Requirement already satisfied: urllib3 in /opt/conda/envs/Python-3.9/lib/pyth
on3.9/site-packages (from ibm-watson-machine-learning) (1.26.7)
Requirement already satisfied: pandas<1.5.0,>=0.24.2 in /opt/conda/envs/Pytho
n-3.9/lib/python3.9/site-packages (from ibm-watson-machine-learning) (1.3.4)
Requirement already satisfied: lomond in /opt/conda/envs/Python-3.9/lib/pytho
n3.9/site-packages (from ibm-watson-machine-learning) (0.3.3)
Requirement already satisfied: packaging in /opt/conda/envs/Python-3.9/lib/py
thon3.9/site-packages (from ibm-watson-machine-learning) (21.3)
Requirement already satisfied: certifi in /opt/conda/envs/Python-3.9/lib/pyth
on3.9/site-packages (from ibm-watson-machine-learning) (2022.9.24)
Requirement already satisfied: tabulate in /opt/conda/envs/Python-3.9/lib/pyt
hon3.9/site-packages (from ibm-watson-machine-learning) (0.8.9)
Requirement already satisfied: ibm-cos-sdk-s3transfer==2.11.0 in /opt/conda/e
nvs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-wat
son-machine-learning) (2.11.0)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /opt/conda/envs/Pyth
on-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-watson-mach
ine-learning) (0.10.0)
Requirement already satisfied: ibm-cos-sdk-core==2.11.0 in /opt/conda/envs/Py
thon-3.9/lib/python3.9/site-packages (from ibm-cos-sdk==2.11.*->ibm-watson-ma
chine-learning) (2.11.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/env
s/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk-core==2.11.0->ibm-
cos-sdk==2.11.*->ibm-watson-machine-learning) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.9/li
b/python3.9/site-packages (from pandas<1.5.0,>=0.24.2->ibm-watson-machine-lea
rning) (2021.3)
Requirement already satisfied: numpy>=1.17.3 in /opt/conda/envs/Python-3.9/li
b/python3.9/site-packages (from pandas<1.5.0,>=0.24.2->ibm-watson-machine-lea
rning) (1.20.3)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.9/lib/pyt
hon3.9/site-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-core==2.1
1.0->ibm-cos-sdk==2.11.*->ibm-watson-machine-learning) (1.15.0)
Requirement already satisfied: charset-normalizer~=2.0.0 in /opt/conda/envs/P
ython-3.9/lib/python3.9/site-packages (from requests->ibm-watson-machine-lear
ning) (2.0.4)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/li
b/python3.9/site-packages (from requests->ibm-watson-machine-learning) (3.3)
Requirement already satisfied: zipp>=0.5 in /opt/conda/envs/Python-3.9/lib/py
thon3.9/site-packages (from importlib-metadata->ibm-watson-machine-learning)
(3.6.0)
Requirement already satisfied: pyparsing!=3.0.5,>=2.0.2 in /opt/conda/envs/Py
thon-3.9/lib/python3.9/site-packages (from packaging->ibm-watson-machine-lear
```

```
ning) (3.0.4)
Installing collected packages: ibm-watson-machine-learning
  Attempting uninstall: ibm-watson-machine-learning
    Found existing installation: ibm-watson-machine-learning 1.0.255
    Uninstalling ibm-watson-machine-learning-1.0.255:
      Successfully uninstalled ibm-watson-machine-learning-1.0.255
Successfully installed ibm-watson-machine-learning-1.0.257
Note: you may need to restart the kernel to use updated packages.
```

In [91]:

```python
from ibm_watson_machine_learning import APIClient
```

In [92]:

```python
uml_credentials = {
    "url": "https://eu-de.ml.cloud.ibm.com",
    "apikey": "jhbVAnr0FGf_IHm7hQyyH-4emOxRTTHxn-beT3_RGP2G"
}
```

In [93]:

```python
def guid_from_space_name(client, space_name):
    space = client.spaces.get_details()
    idr = []
    for i in space['resources']:
        idr.append(i['metadata']['id'])
```

In [94]:

```python
space_uid = guid_from_space_name(client, "university")
```

```
254e8ab3-f915-4425-9564-577b68cbbbf2
```

In [95]:

In [96]:

```
Note: 'limit' is not provided. Only first 50 records will be displayed if the n
umber of records exceed 50
------------------------------------  ------------  ------------------------
ID                                    NAME          CREATED
50fe1fae-1790-4858-8af1-ede9b17ea63e  B2-insurance  2022-10-29T06:06:13.859Z
254e8ab3-f915-4425-9564-577b68cbbbf2  iris_demo     2022-10-27T06:26:23.393Z
------------------------------------  ------------  ------------------------
```

In [97]:

Out[97]:

```
'SUCCESS'
```

```
---------------------------    -------------------------------------  ----
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
---------------------------    -------------------------------------  ----
```

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

In [99]:

```
import sklearn
```

Out[99]:

'1.0.2'

In [100]:

```
MODEL_NAME = 'universitypredict'
DEPLOYMENT_NAME = 'uni_new'
```

In [101]:

```
software_spec_uid = client.software_specifications.get_id_by_name('runtime-22.1-py3.9')
```

In [102]:

```
model_props = {
    client.repository.ModelMetaNames.NAME: MODEL_NAME,
    client.repository.ModelMetaNames.TYPE: 'scikit-learn_1.0 ',
    client.repository.ModelMetaNames.SOFTWARE_SPEC_UID: software_spec_uid
}
```

```python
model_details = client.repository.store_model(
    model = DEMO_MODEL,
    meta_props = model_props,
    training_data = X_train,
    training_target = y_train
)
model_details
```

Out[103]:

```
{'entity': {'hybrid_pipeline_software_specs': [],
  'label_column': 'Chance of Admit ',
  'schemas': {'input': [{'fields': [{'name': 'GRE Score', 'type': 'int64'},
      {'name': 'TOEFL Score', 'type': 'int64'},
      {'name': 'University Rating', 'type': 'int64'},
      {'name': 'SOP', 'type': 'float64'},
      {'name': 'LOR ', 'type': 'float64'},
      {'name': 'CGPA', 'type': 'float64'},
      {'name': 'Research', 'type': 'int64'}],
     'id': '1',
     'type': 'struct'}],
   'output': []},
  'software_spec': {'id': '12b83a17-24d8-5082-900f-0ab31fbfd3cb',
   'name': 'runtime-22.1-py3.9'},
  'type': 'scikit-learn_1.0'},
 'metadata': {'created_at': '2022-11-10T09:06:10.793Z',
  'id': '84d89169-e725-45ad-832e-944628eb350d',
  'modified_at': '2022-11-10T09:06:13.535Z',
  'name': 'universitypredict',
  'owner': 'IBMid-666002J3G7',
  'resource_key': '654a0e20-4cb1-4954-a3c8-3ac94af46da4',
  'space_id': '254e8ab3-f915-4425-9564-577b68cbbbf2'},
 'system': {'warnings': []}}
```

In [104]:

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

Out[104]:

```
'84d89169-e725-45ad-832e-944628eb350d'
```

```
deployment_props = {
    client.deployments.ConfigurationMetaNames.NAME:DEPLOYMENT_NAME,
    client.deployments.ConfigurationMetaNames.ONLINE: {}
}

deployment = client.deployments.create(
    artifact_uid = model_id,
    meta_props = deployment_props
)
```

```
######################################################################################
########

Synchronous deployment creation for uid: '84d89169-e725-45ad-832e-944628eb350d'
started

######################################################################################
########


initializing
Note: online_url is deprecated and will be removed in a future release. Use ser
ving_urls instead.

ready


--------------------------------------------------------------------------------
-----------------
Successfully finished deployment creation, deployment_uid='dcc0e91e-b606-4291-9
b97-0ec6ebef14f4'
--------------------------------------------------------------------------------
-----------------
```