IBM CLOUD DEPLOYMENT

Date	16 November 2022
Team ID	PNT2022TMID14644
Project Name	Efficient water quality analysis and prediction using Machine Learning

TRAINING THE MODEL ON IBM AND DEPLOYMENT

IBM Cloud Pak for Data

Projects / Custom Model Deployment / IBM_DEPLOY

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Notebook saved Not Trusted | Python 3.9

Format Code

```
Requirement already satisfied: docutils<0.16,>=0.10 in /usr/local/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0->ibm-co
s-sdk==2.7.*->ibm_watson_machine_learning) (0.15.2)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/local/lib/python3.7/dist-packages (from ibm-cos-sdk-core==2.7.0-
>ibm-cos-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_machi
ne_learning) (2022.6)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.7/dist-packages (from pandas<1.5.0,>=0.24.2->ibm_watson_mach
ine_learning) (1.21.6)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-dateutil<3.0.0,>=2.1->ibm-cos-sdk-co
re==2.7.0->ibm-cos-sdk==2.7.*->ibm_watson_machine_learning) (1.15.0)
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learn
ing) (3.0.4)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packages (from requests->ibm_watson_machine_learning)
(2.10)
Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local/lib/python3.7/dist-packages (from importlib-metadata->ibm_wat
son_machine_learning) (4.1.1)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/dist-packages (from importlib-metadata->ibm_watson_machine_lea
rning) (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_machi
ne_learning) (3.0.9)
```

In [ ]:
```
!pip install botocore
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: botocore in /usr/local/lib/python3.7/dist-packages (1.29.11)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /usr/local/lib/python3.7/dist-packages (from botocore) (0.10.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /usr/local/lib/python3.7/dist-packages (from botocore) (2.8.2)
Requirement already satisfied: urllib3<1.27,>=1.25.4 in /usr/local/lib/python3.7/dist-packages (from botocore) (1.25.11)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-dateutil<3.0.0,>=2.1->botocore) (1.1
```

Data
Files   Connections

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

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water_dataX.csv
Insert to code

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Format Code

```
Number of CV Scores used in Average: 5
```

In [ ]:
```
import pickle
pickle.dump(y_pred, open('wqi.pkl', 'wb'))
model = pickle.load(open('wqi.pkl','rb'))
```

Training model on ibm

In [ ]:
```
from ibm_watson_machine_learning import APIClient
```

In [ ]:
```
wml_credentials = {
    "apikey":"EGyk5k6320eQVTUSqS3piGoS3eAKWeZu5ywrJQHajo-3",
    "url":"https://us-south.ml.cloud.ibm.com"
}
```

In [ ]:
```
wml_client = APIClient(wml_credentials)
wml_client.spaces.list()
```

```
Python 3.7 and 3.8 frameworks are deprecated and will be removed in a future release. Use Python 3.9 framework instead.
Note: 'limit' is not provided. Only first 50 records will be displayed if the number of records exceed 50
```

Data
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Format Code

```python
In [ ]: MODEL_NAME = 'Water-Quality'
        DEPLOYMENT_NAME = 'water-quality-prediction'
        DEPLOY_MODEL = regressor
```

```python
In [ ]: software_spec_uid = wml_client.software_specifications.get_id_by_name('runtime-22.1-py3.9')
```

```python
In [ ]: model_props = {
            wml_client.repository.ModelMetaNames.NAME: MODEL_NAME,
            wml_client.repository.ModelMetaNames.TYPE: 'scikit-learn_1.0',
            wml_client.repository.ModelMetaNames.SOFTWARE_SPEC_UID: software_spec_uid
```

```python
In [ ]: model_details = wml_client.repository.store_model(
            model=DEPLOY_MODEL,
            meta_props=model_props,
            training_data=x_train,
            training_target=y_train
        )
```

Data

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```python
In [ ]: import os, types
        import pandas as pd
        from botocore.client import Config
        import ibm_boto3

        def __iter__(self): return 0

        # @hidden_cell
        # The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
        # You might want to remove those credentials before you share the notebook.
        cos_client = ibm_boto3.client(service_name='s3',
            ibm_api_key_id='EGyk5k6320eQVTUSqS3piGoS3eAKWeZu5ywrJQHajo-3',
            ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
            config=Config(signature_version='oauth'),
            endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')

        bucket = 'custommodeldeployment-donotdelete-pr-thtas59indgzc0'
        object_key = 'water_dataX.csv'

        body = cos_client.get_object(Bucket=bucket,Key=object_key)['Body']
        # add missing __iter__ method, so pandas accepts body as file-like object
        if not hasattr(body, "__iter__"): body.__iter__ = types.MethodType( __iter__, body )

        df_data_1 = pd.read_csv(body)
        df_data_1.head()
```

```python
In [ ]: df.shape
```

Data

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water_dataX.csv

Insert to code