

SPRINT-2 PROJECT DOCUMENT

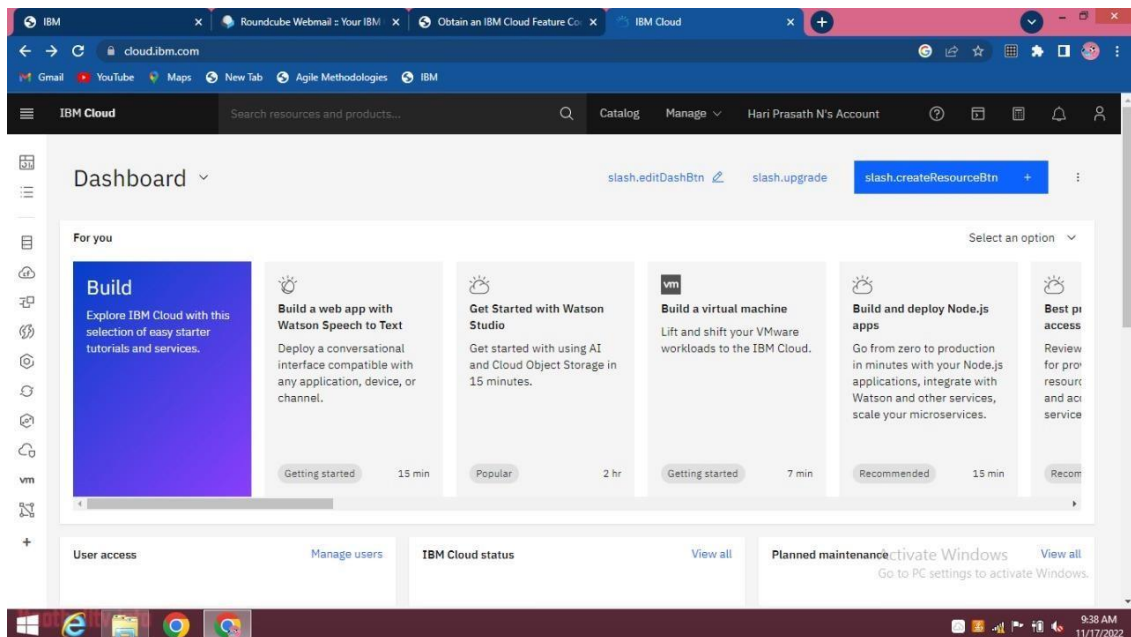
Team ID	PNT2022TMID44333
Project Name	Developing a Flight Delay Prediction Model Using Machine Learning

Sprint-2 Development Phase:-

Outline:

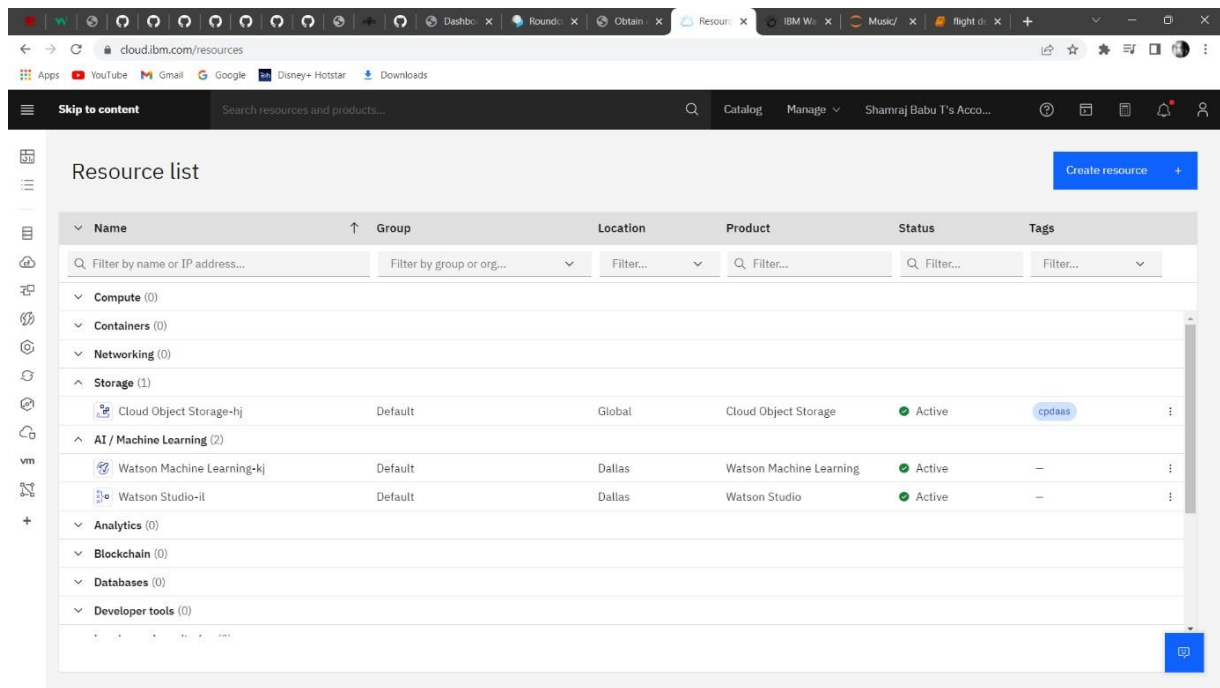
- Building the Model
- Evaluating the Model
- Creating IBM Cloud Account
- Model Deployment on IBM Cloud

Creating IBM Cloud Account:



IBM Cloud Required Resources:

- Watson Studio
- Watson Machine Learning
- Cloud Object Storage



Deploy the Model on IBM Watson Studio:

```
pip install -U ibm-watson-machine-learning
from ibm_watson_machine_learning import APIClient
import json
```

In [63]:

In [64]:

```
wml_credentials = {
    "apikey": "4fJbepuok7oCO1UkeKU831Sq5rz5-JP0R_hljeB2oaEL",
    "url": "https://us-south.ml.cloud.ibm.com"
}
```

In [65]:

```
wml_client = APIClient(wml_credentials)
wml_client.spaces.list()
```

```
SPACE_ID="deaaa6e0-4843-467d-94d8-71d0272de83b"
```

In [67]:

```
wml_client.set.default_space(SPACE_ID)
```

In [68]:

```
wml_client.software_specifications.list(500)
import sys
```

In [70]:

```
sys.version
```

In [71]:

```
pip install ibm-watson-machine-learning
```

```
import sklearn  
sklearn.__version__
```

In [93]:

```
MODEL_NAME = "RandomForestClassifier()  
DEPLOYMENT_NAME = 'flight delay'  
DEMO_MODEL = model
```

In [94]:

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

In [95]:

```
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  
}
```

In [96]:

```
model_details = wml_client.repository.store_model(  
    model=DEMO_MODEL,  
    meta_props=model_props,  
    training_data=x_train,  
    training_target=y_train  
)
```

In [97]:

```
model_details
```

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

In [99]:

```
deployment_props = {  
    wml_client.deployments.ConfigurationMetaNames.NAME: DEPLOYMENT_NAME,
```

```
wml_client.deployments.ConfigurationMetaNames.ONLINE: {}
}
```

In [101]:

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

Deployment The Model:

The screenshot shows the IBM Watson Studio interface. The top navigation bar includes the IBM Watson Studio logo, a search bar, and user information. The main content area is titled 'model' and has tabs for Overview, Assets, Deployments, Jobs, and Manage. The 'Deployments' tab is active, showing a table with one deployment: 'flight_delay_deployment'. The deployment is 'Online' and 'Deployed', using the 'RandomForestClassifier()' asset. A sidebar on the right contains a file upload prompt: 'Drop files here or browse for files to upload. Stay on the page until upload completes. Incomplete uploads are cancelled.'

Name	Type	Status	Asset	Last modified
flight_delay_deployment	Online	Deployed	RandomForestClassifier()	5 seconds ago Shamraj Babu T (You)

Testing the Deployment Model:

The screenshot shows the 'Test' page for the 'flight_delay_deployment' model. The page has tabs for 'API reference' and 'Test'. The 'Test' tab is active, showing a section for 'Enter input data'. There are two input methods: 'Text input' and 'JSON input'. Below the input methods, there is a prompt to 'Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.' and links to 'Download CSV template', 'Browse local files', and 'Search in space'. A table with 9 columns (f0 to f8) and 5 rows of data is displayed. The data is as follows:

	f0 (float)	f1 (float)	f2 (float)	f3 (float)	f4 (float)	f5 (float)	f6 (float)	f7 (float)	f8 (float)
1	1399	1	2	2	1	5	1	22	1
2	1823	3	4	23	2	4	23	6	3
3	1597	4	7	14	3	3	14	3	14
4	1768	6	5	7	4	2	18	8	19
5	1399	2	3	13	5	1	5	13	4

The table indicates '5 rows, 9 columns'. A 'Predict' button is located at the bottom right of the input area.

IBM Watson Studio

Search in your workspaces

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58

Deployments / model / RandomForestClassifier0 /

flig

API

Enter

Text

Enter

Download

5 rows

Prediction results

Prediction type

Binary classification

Prediction percentage

5

Records

1

Confidence level distribution

Table view

JSON view

	Prediction	Confidence
1	1	100%
2	1	98%
3	1	100%
4	1	100%
5	1	100%
6		
7		
8		
9		
10		
11		
12		
13		

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