

SPRINT-2 PROJECT DOCUMENT

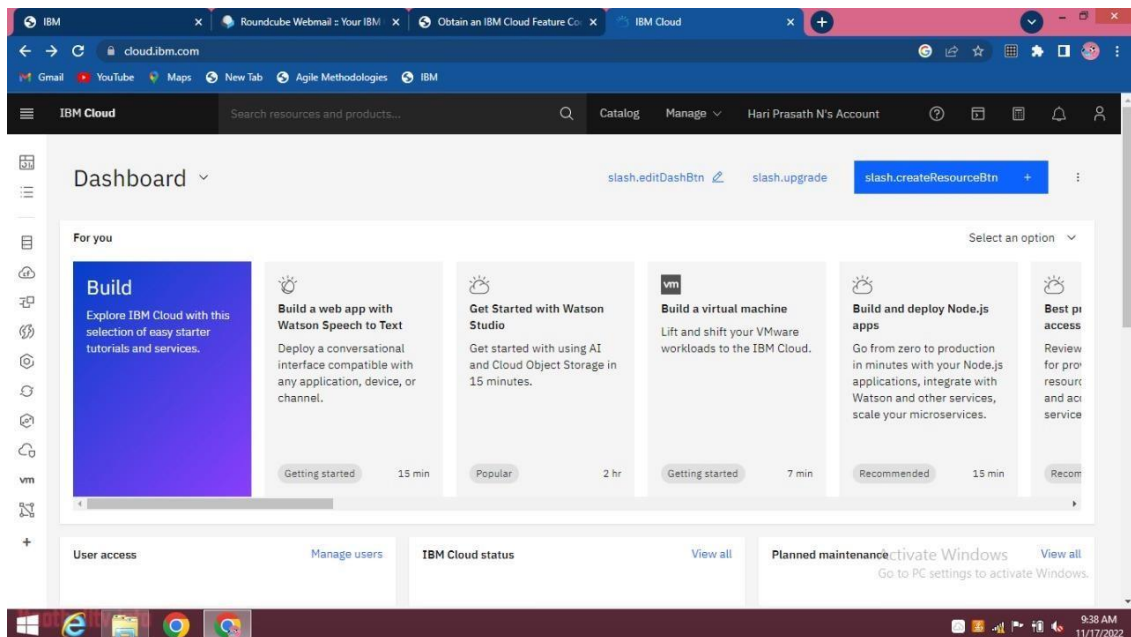
Team ID	PNT2022TMID44333
Project Name	Developing a Flight Delay Prediction Model Using Machine Learning

Sprint-2 Development Phase:-

Outline:

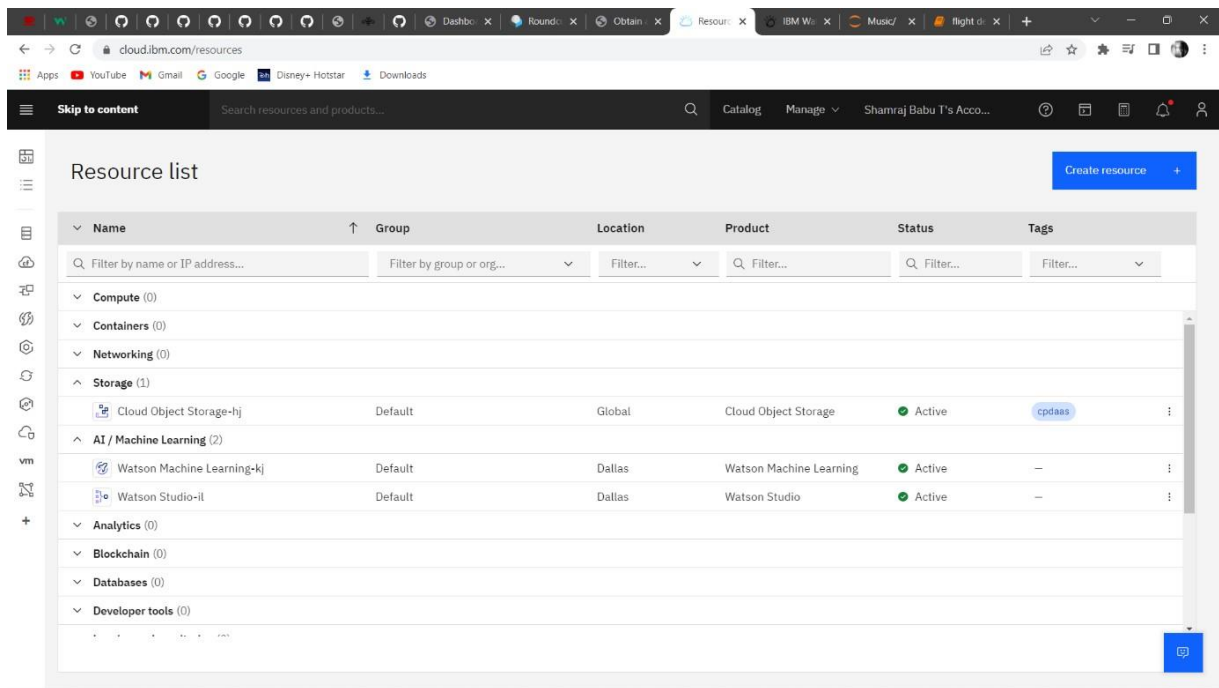
- Building the Model
- Evaluating the Model
- Creating IBM Cloud Account
- Model Deployment on IBM Cloud

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]:

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

In [64]:

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

In [65]:

```
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]:

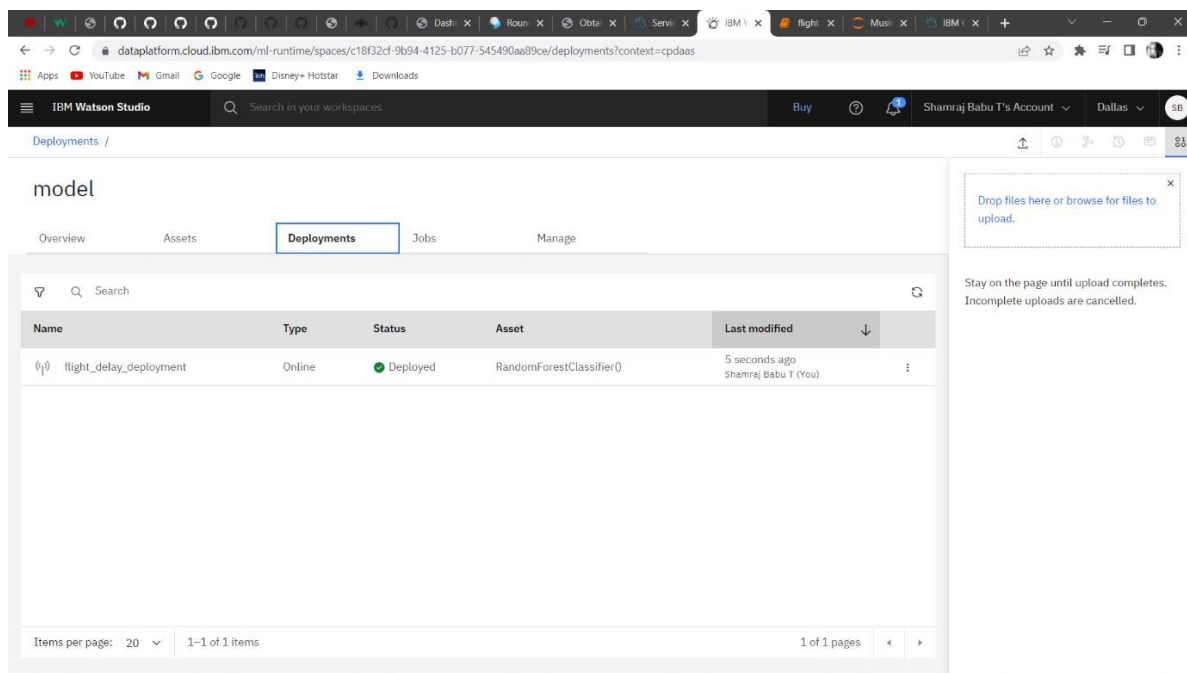
```
deployment_props = {  
    wml_client.deployments.ConfigurationMetaNames.NAME: DEPLOYMENT_NAME,
```

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

In [101]:

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

Deployment The Model:

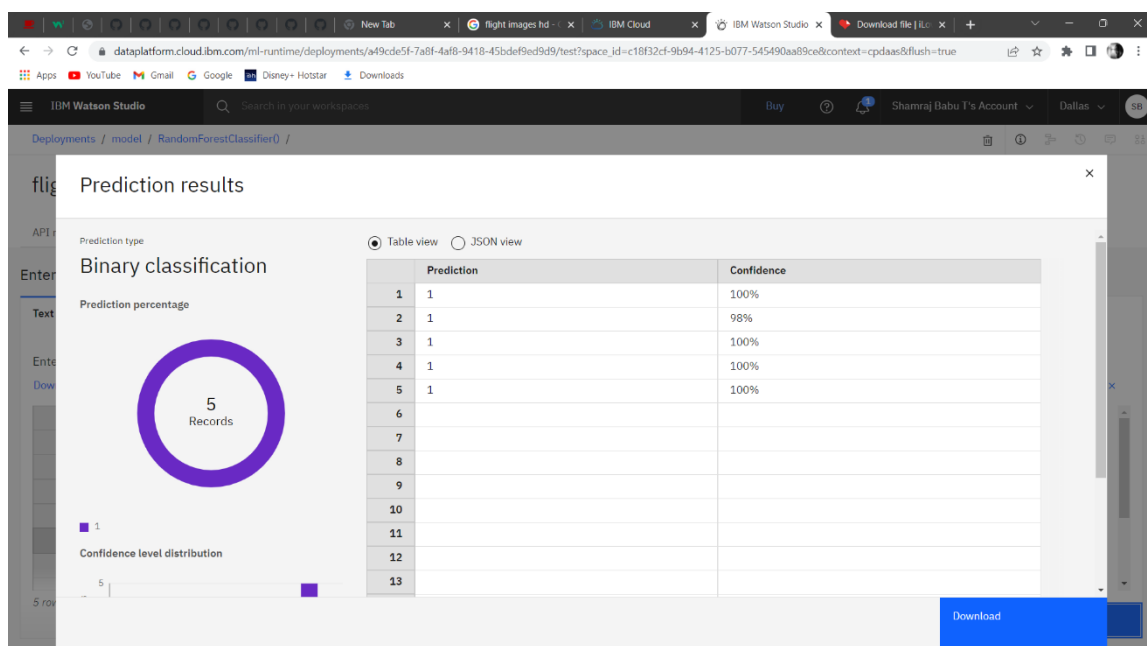


The screenshot shows the IBM Watson Studio interface. The 'Deployments' tab is selected, displaying a table with the following data:

Name	Type	Status	Asset	Last modified
flight_delay_deployment	Online	Deployed	RandomForestClassifier0	5 seconds ago Shamraj Babu T (You)

At the bottom of the table, it indicates 'Items per page: 20' and '1-1 of 1 items'. A notification box on the right says 'Drop files here or browse for files to upload.' and 'Stay on the page until upload completes. Incomplete uploads are cancelled.'

Testing the Deployment Model:



The screenshot shows the 'Prediction results' page for the 'flight_delay_deployment' model. The 'Prediction type' is 'Binary classification'. The 'Prediction percentage' is shown as a donut chart with '5 Records'. The 'Confidence level distribution' is shown as a bar chart. The 'Table view' is selected, displaying the following data:

	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		

A 'Download' button is visible at the bottom right of the table.