SPRINT – 2 PROJECT DOCUMENT

Date	5 November 2022
Team ID	PNT2022TMID07489
Project Name	Flight Delay Prediction Using Machine Learning

DEVELOPMENT PHASE:

SPRINT-2:

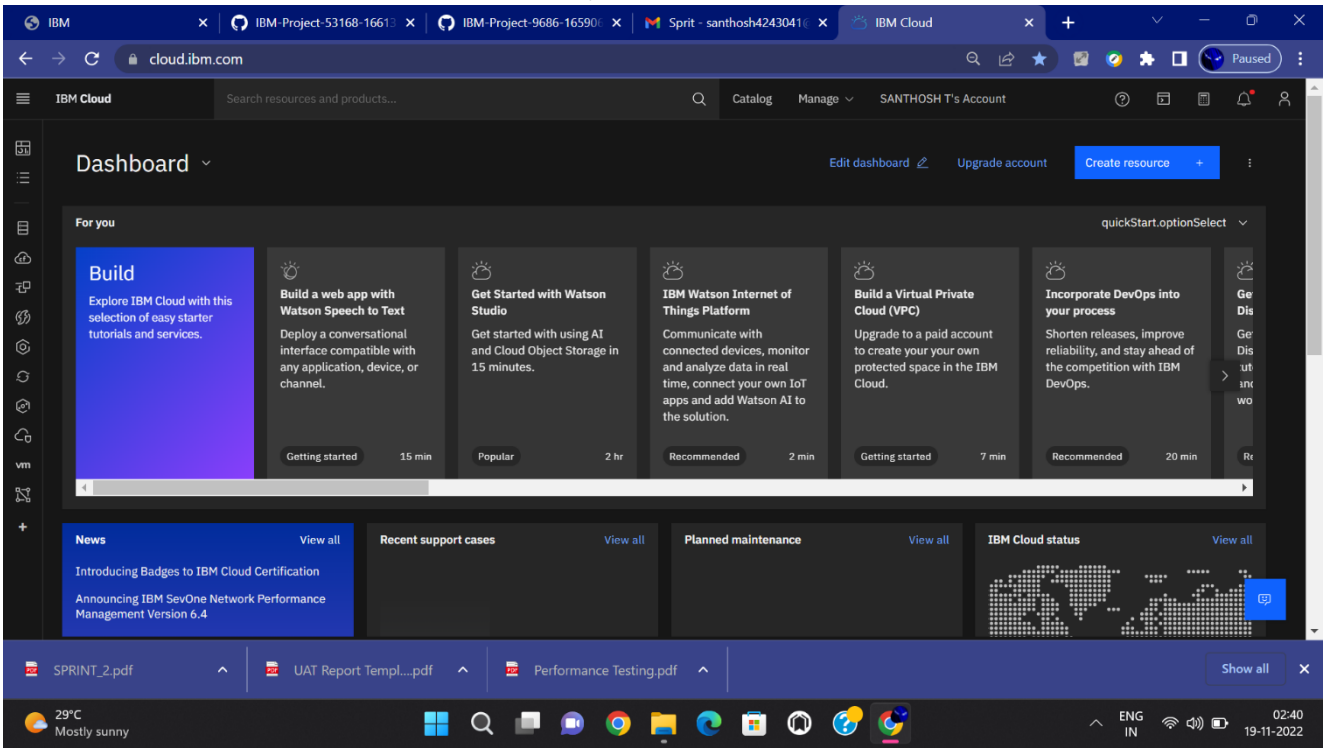
- Creating IBM cloud account & Required Resources
- Deploy our model in IBM Watson
- Creating Dashboard using HTML/CSS
- Create web app and Hosting in flask
- Testing web app

Creating IBM cloud account & Required Resources:

Creating IBM cloud account:

Frist, need to create IBM Cloud account by using SI Mail Id and SI Password which is provided by IBM in profile.

Below dashboard of an account after created,



Creating IBM Cloud Required Resources:

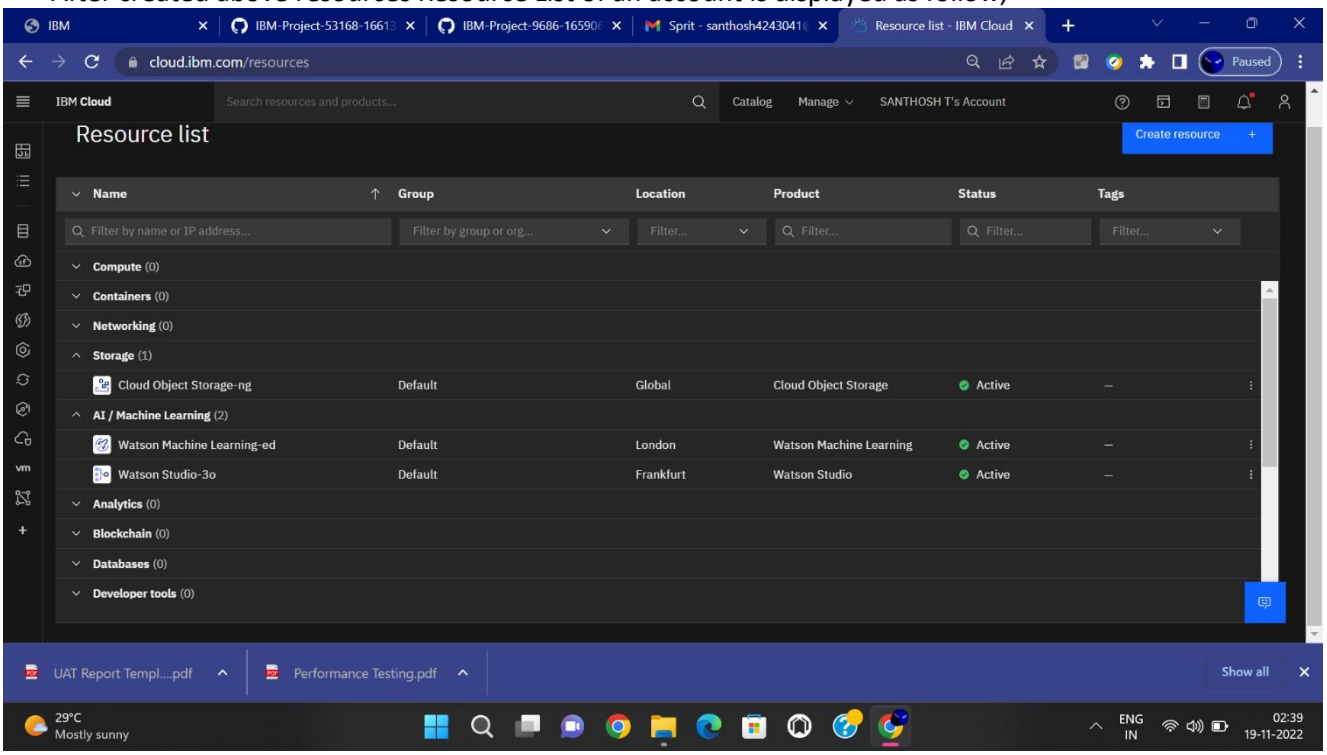
After creating IBM cloud account, to deploy ML model, need to create following resources such as,

Cloud Object Storage

Watson Machine Learning

Watson Studio

After created above resources Resource List of an account is displayed as follow,



All the resource are in active state.

All the required cloud resources are created successfully.

Deploy our model in IBM Watson:

To deploy ML model in IBM cloud, need to create project in IBM Watson. After successful creation of project import .ipynb file of sprint-1 which ML models are build in Jupyter notebook.

Upload required datasets and import it.

Deploy model using following code,

```
!pip install -U ibm-watson-machine-learning
from ibm_watson_machine_learning import APIClient
import json
import numpy as np
wml_cred={
   "apikey":"okbr7ARnOQjyplTOyvNFC2QVkCF6q7afpci065Hucby8",
   "url":"https://us-south.ml.cloud.ibm.com"
}
wml_clients=APIClient(wml_cred)
wml_clients.spaces.list()
space_id="6d7c1218-3aca-4256-be3d-d610732530b1"
```

```
wml_clients.set.default_space(space_id)
wml_clients.software_specifications.list(500)
MODEL_NAME="randomforest"
DEPLOYMENT_NAME="rf_deployment"
DEMO_MODEL=rf
soft_sepc_id=wml_clients.software_specifications.get_id_by_name("runtime-22.1-py3.9")
```

In [115]:

```
model_props={
   wml_clients.repository.ModelMetaNames.NAME:MODEL_NAME,
   wml_clients.repository.ModelMetaNames.TYPE:"scikit-learn_1.0",
   wml_clients.repository.ModelMetaNames.SOFTWARE_SPEC_UID: soft_sepc_id

}
```

In [116]:

```
model_details=wml_clients.repository.store_model(model=DEMO_MODEL,meta_props=model_props,trai
ning_data=x_train,
                                 training_target=y_train.values.ravel())
```

In [117]:

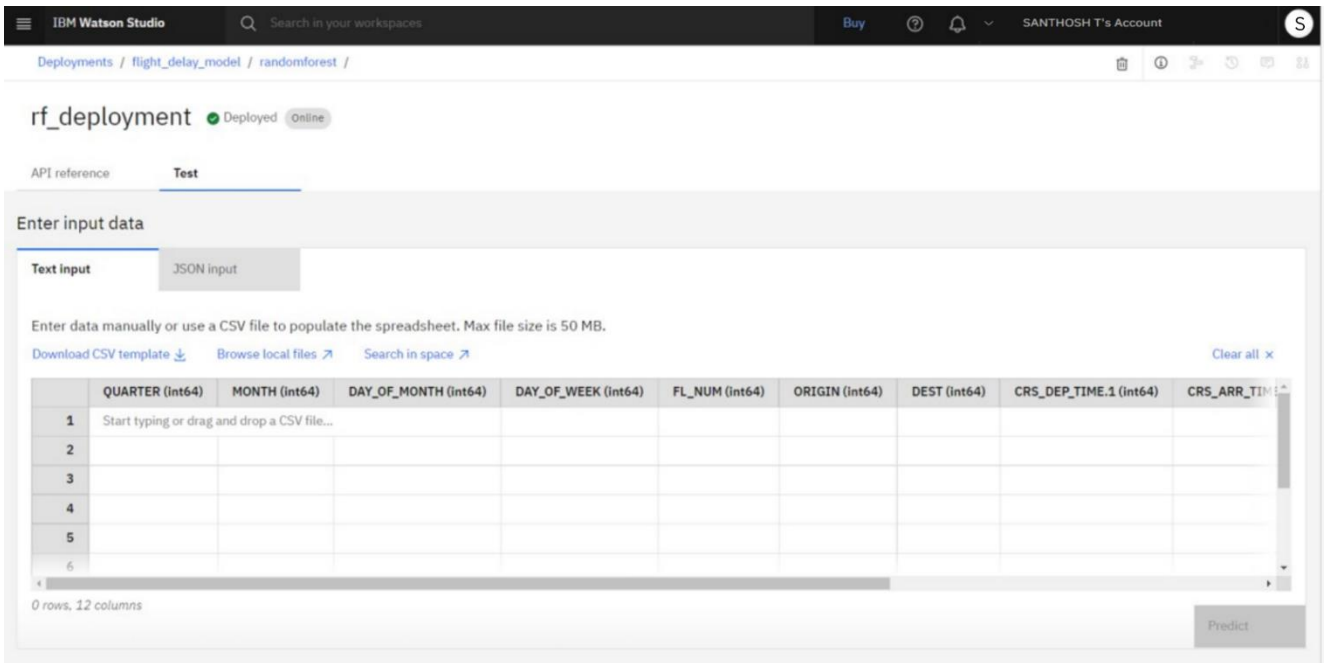
```
model_details
model_id=wml_clients.repository.get_model_id(model_details)
dep_props={
   wml_clients.deployments.ConfigurationMetaNames.NAME:DEPLOYMENT_NAME,
   wml_clients.deployments.ConfigurationMetaNames.ONLINE:{}
}
```

In [125]:

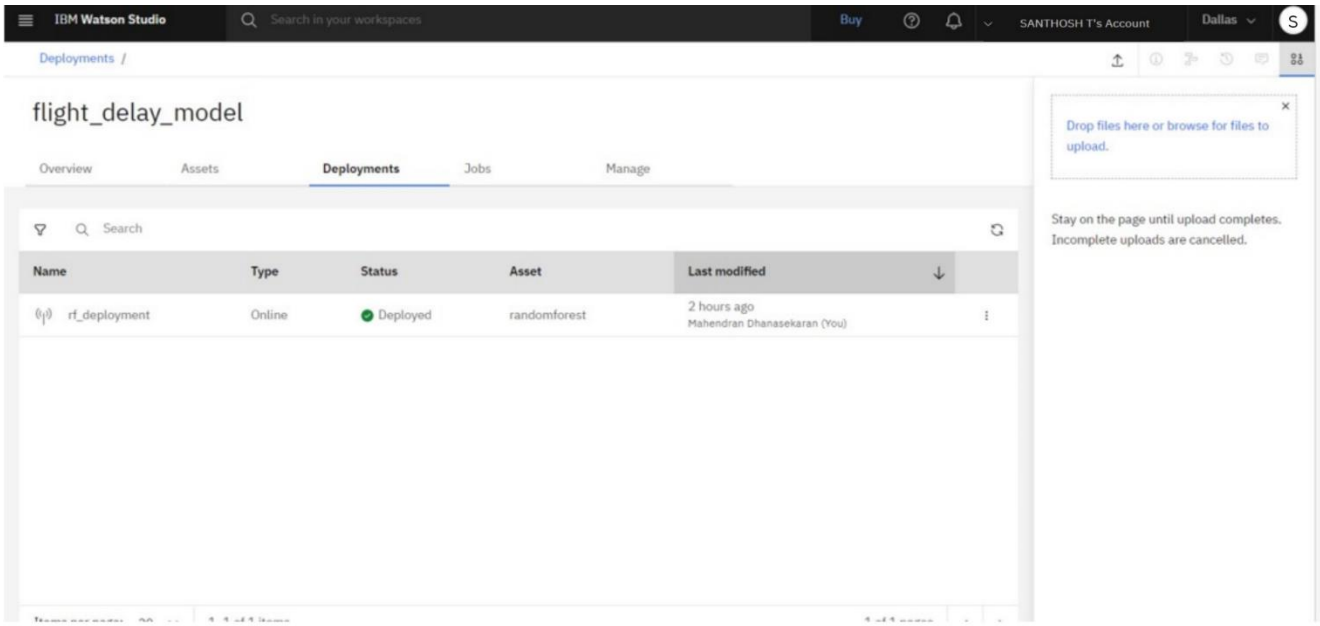
```
deployment=wml_clients.deployments.create(artifact_uid=model_id,meta_props=dep_props)
```

NOTE: APIKey must need to create to deploy and connect API

After successful of deployment, deployed is appeared in Deployment section as follow,



Testing of deployed model as follow, by giving values of all the features and it gives prediction.

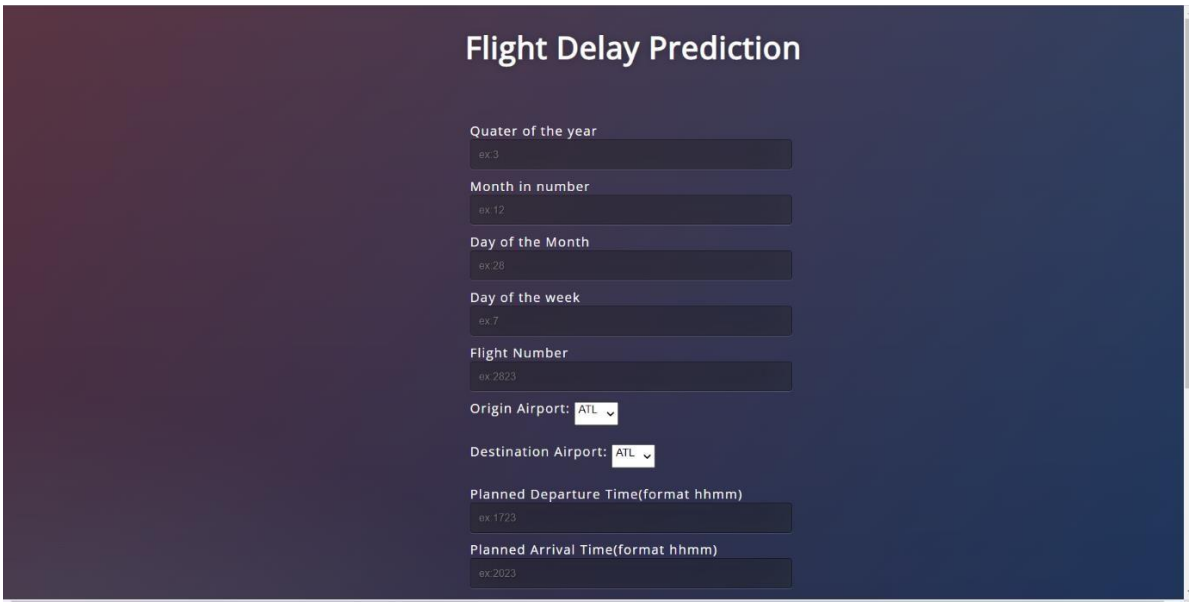


After these, need to copy API requesting codes on required language(python).

Creating Dashboard using HTML/CSS:

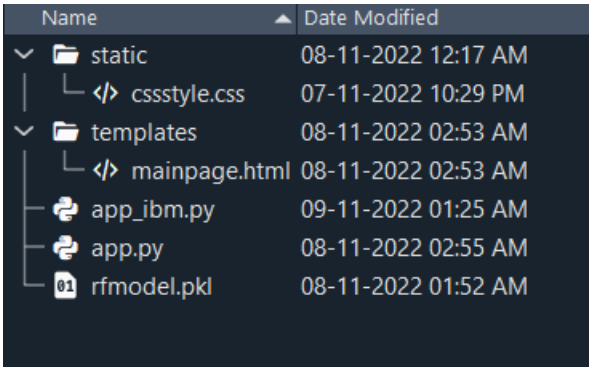
Frontend Dashboard is created using HTML/CSS,

Result as web page like,



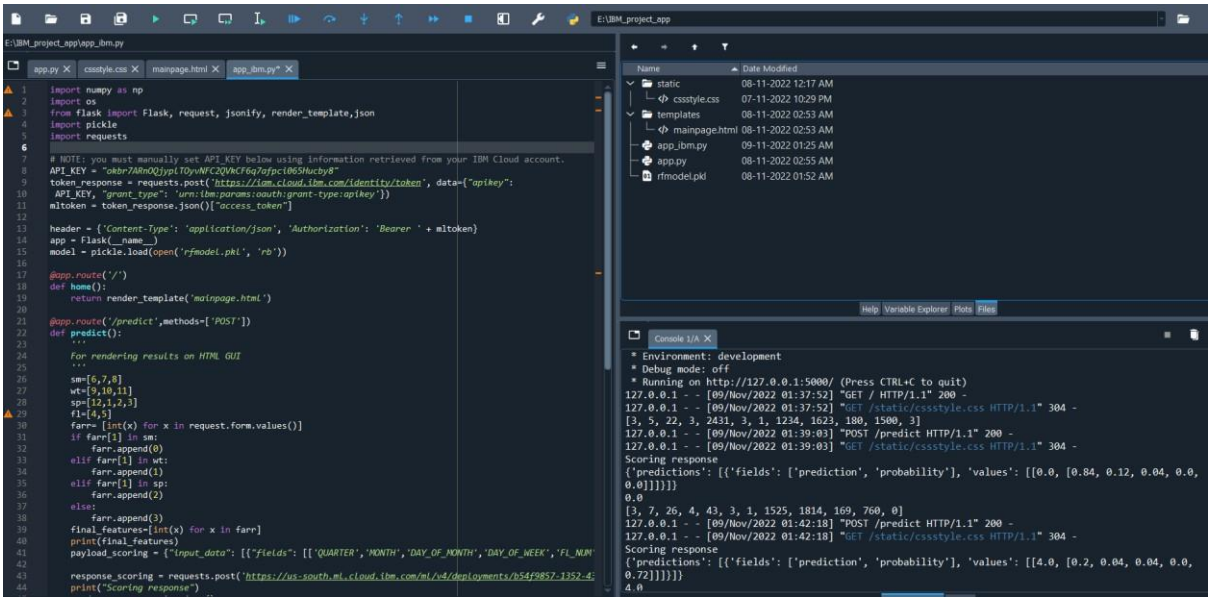
Create web app and Hosting in flask:

First thing, need to create directory as follow,



Then, code the required logic in app.py file with API connection , request and response code.

Spyder IDE looks like,



Run the app.py file.

Localhost URL is displayed in console, copy and paste in browser then search it , frond end HTML?CSSpage is displayed. Successfully created and hosted web app in flask.

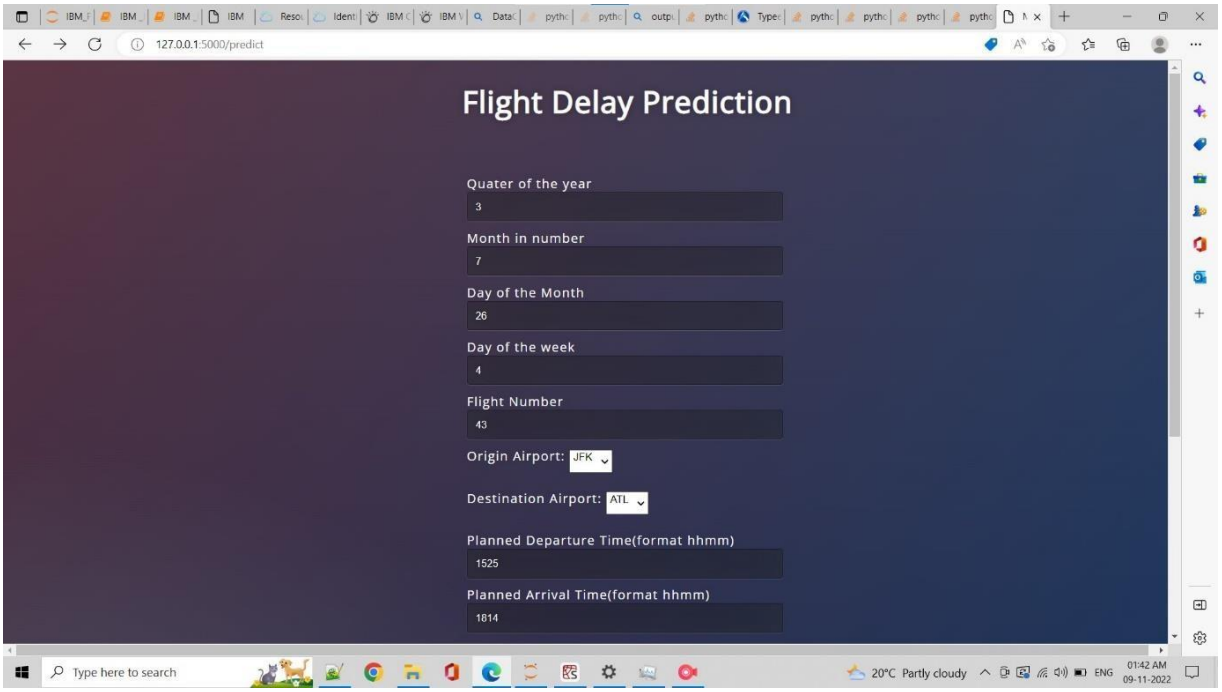
If any error caused as flask in production mode, then

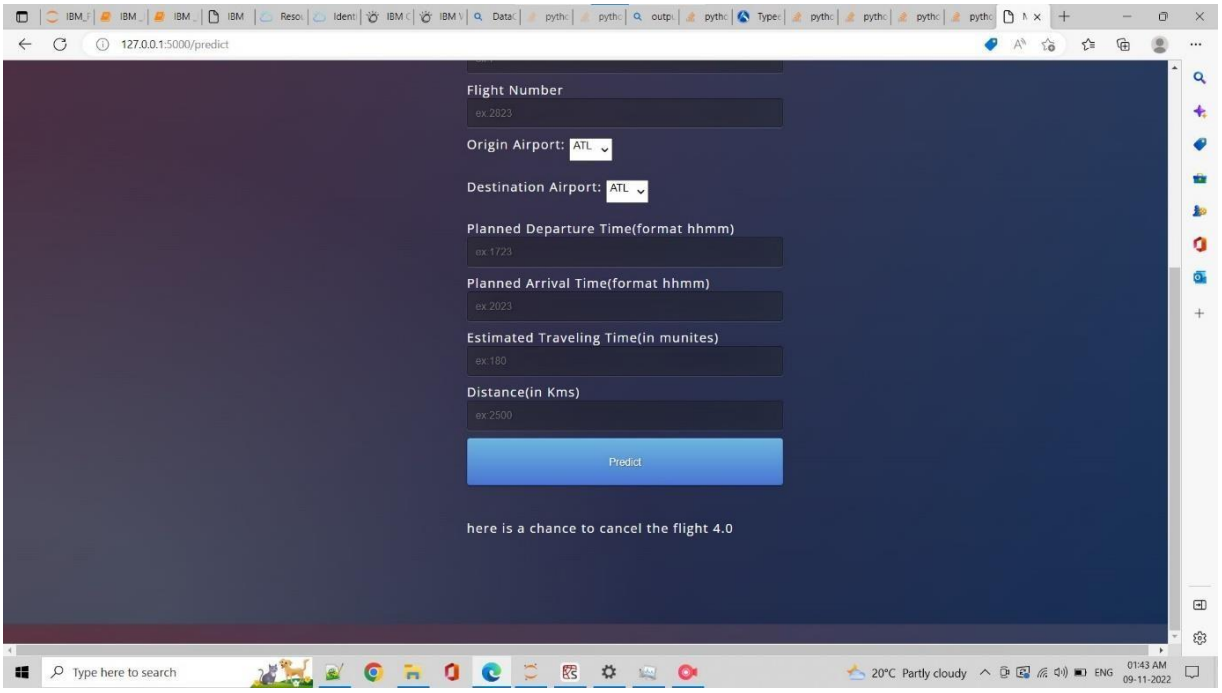
Set FLASK_ENV=Development,

Then run the app

Testing web app:

Enter the data on the required fields,





Output is predicted by ML model successfully.