

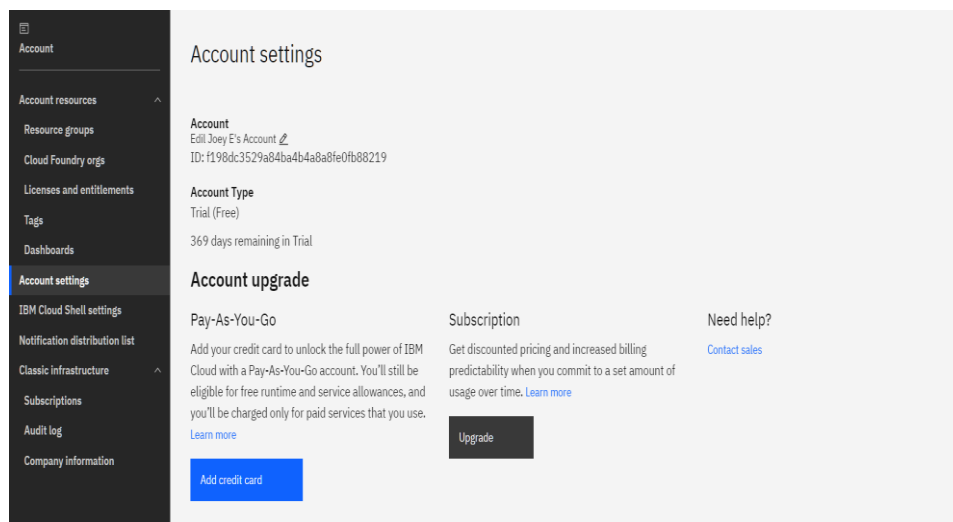
# Project Development Phase

## Sprint-4

### Model Building

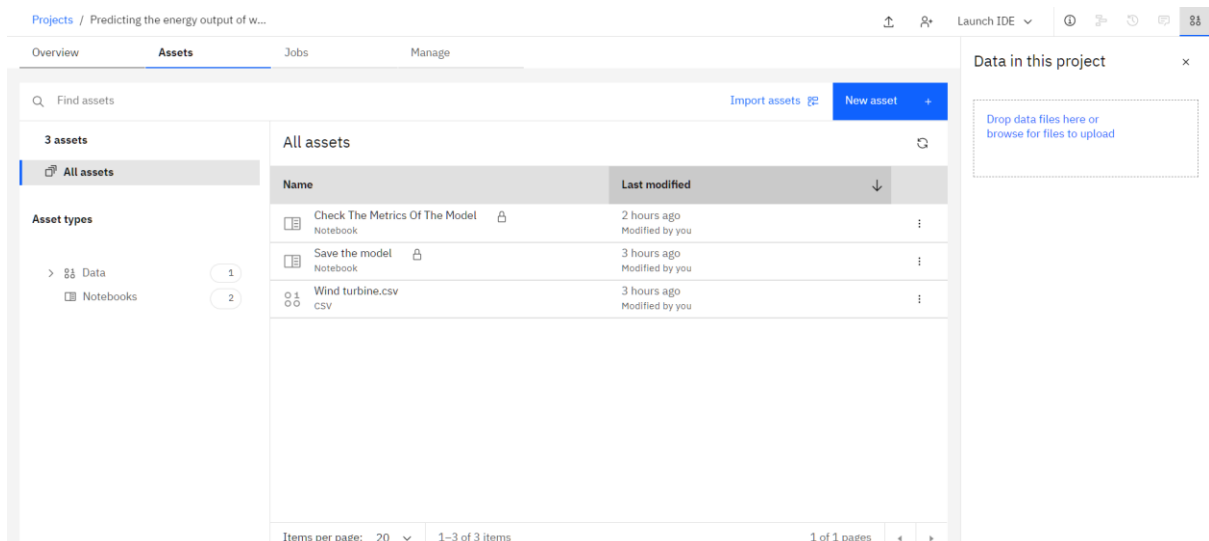
Date	17-11-2022
Team ID	PNT2022TMID34159
Project	Predictiong th energy output of wind turbine based on weather condition

## Register For IBM Cloud



The screenshot shows the IBM Cloud Account settings page. On the left is a dark sidebar with navigation links: Account, Account resources, Resource groups, Cloud Foundry orgs, Licenses and entitlements, Tags, Dashboards, Account settings (highlighted), IBM Cloud Shell settings, Notification distribution list, Classic infrastructure, Subscriptions, Audit log, and Company information. The main content area is titled 'Account settings' and includes: Account information (Edit, ID: f198dc3529a84ba4b4a8a8fe0fb88219), Account Type (Trial (Free), 369 days remaining in Trial), and an 'Account upgrade' section. The upgrade section has three cards: 'Pay-As-You-Go' (Add credit card), 'Subscription' (Get discounted pricing), and 'Need help?' (Contact sales). There are 'Add credit card' and 'Upgrade' buttons.

## Train The ML Model On IBM



The screenshot shows the IBM Cloud Project Assets page for a project titled 'Predicting the energy output of w...'. The top navigation bar includes 'Overview', 'Assets' (selected), 'Jobs', and 'Manage'. Below the navigation is a search bar and buttons for 'Import assets' and 'New asset'. The left sidebar shows '3 assets' and 'All assets' selected. Under 'Asset types', there are 'Data' (1) and 'Notebooks' (2). The main area displays a table of assets:

Name	Last modified
Check The Metrics Of The Model Notebook	2 hours ago Modified by you
Save the model Notebook	3 hours ago Modified by you
Wind turbine.csv	3 hours ago Modified by you

At the bottom, it shows 'Items per page: 20' and '1-3 of 3 items'. On the right, there is a 'Data in this project' section with a dashed box for uploading files.

## Loading the dataset in IBM cloud

```
import os, types
import pandas as pd
from boto3.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='Z4ZuC9XB08iW00mbozzdDeCgUd77ECzvpG16l37wKjA0',
                              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 = 'predictingtheenergyoutputofwindtu-donotdelete-pr-hba2rrilk1rlwt'
object_key = 'Wind turbine.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 = pd.read_csv(body)
df.head()
```

## Working on Watson Studio with Model in IBM Cloud

The screenshot shows the IBM Watson Studio interface. The top navigation bar includes the IBM Watson Studio logo, a search bar, and user account information (Edit Joey E's Account, Dallas). The main workspace displays a Jupyter notebook with the following code and output:

```
In [22]: from ibm_watson_machine_learning import APIClient

In [23]: wml_credentials = {
          "url": "https://us-south.ml.cloud.ibm.com",
          "apikey": "6AYpPSBjHwUtb2_rt8f8CK0-Qgw_USPOeML0nBVpQc3H"
        }

In [25]: wml_client = APIClient(wml_credentials)

In [26]: wml_client.spaces.list()

Note: 'limit' is not provided. Only first 50 records will be displayed if the number of records exceed 50
-----
ID    NAME    CREATED
-----
-----

In [28]: space_id="91cc7351-dee4-4ab9-85e2-4d7748ce713b"
wml_client.set.default_space(space_id)

Out[28]: 'SUCCESS'

In [29]: wml_client.software_specifications.list()

-----
NAME                                ASSET_ID                                TYPE
default_py3.6                      0062b8c9-8b7d-44a0-a9b9-46c416adcbd9    base
kernel-spark3.2-scala2.12          020d09ce-7ac1-5e08-ac1a-31189867356a    base
pytorch-ommx_1.3-py3.7-edt        009ea134-3346-5748-b513-49128e15d288    base
criteo-learn-on-mx-2.6             00c5c1d0-a21a-4673-a368-0b7b6c6ff607    base
```

# Getting API Key

The screenshot shows the IBM Cloud IAM console. The left sidebar contains navigation links: IAM, Manage identities, Users, Trusted profiles, Service IDs, API keys (selected), Identity providers, Manage access, Access groups, Authorizations, Roles, Gain insight, Inactive identities, Inactive policies, and Settings. The main content area is titled "API keys" and includes a search bar, a "Create" button, and a table of API keys. The table has columns for Status, Name, Description, and Date Created. A single key named "newKey" is listed with a description "for Nalayiathiran Project" and a creation date of "2022-11-17 10:52 GMT". Below the table, it shows "Items per page: 25" and "1-25 items".

IBM Cloud

Search resources and products...

API keys

Create, view, and work with API keys that you have access to manage. IBM Cloud API keys are associated with a user's identity and can be used to access cloud platform and classic infrastructure APIs, depending on the access that is assigned to the user. The following table displays a list of API keys created in this account. [Learn more.](#)

Looking for more options to manage API Keys? Try [IBM Cloud® Secrets Manager](#) for creating and leasing API keys dynamically and storing them securely in your own dedicated instance.

View: My IBM Cloud API keys

API keys associated with a user's identity have the same access that the user is assigned across all accounts. To update the access for an API key, assign or remove access for the user.

Create +

Status	Name	Description	Date Created
	newKey	for Nalayiathiran Project	2022-11-17 10:52 GMT

Items per page: 25 1-25 items Page 1

# Deployment in IBM Cloud

The screenshot shows the IBM Cloud Deployments console for a project named "Sample". The top navigation bar includes "Deployments /" and various icons. The main content area has tabs for "Overview" (selected), "Assets", "Deployments", "Jobs", and "Manage". The "Overview" tab displays a summary of the deployment status. On the left, under "Assets", there is a list of assets including "Power\_Prediction" (2 hours ago) and a "View all (1)" link. In the center, the "Deployments" section shows a summary of deployment status: 1 Deployed and 0 Failed. Below this, the "Job runs" section shows 0 Active and 0 Failed (last 24 hours). On the right, the "Space activity" section shows two events: "Online deployment ready" (The online deployment "Train The Model" in space "Sample" is ready to accept requests. Today at 05:00 PM) and "Online deployment created" (You created online deployment "Train The Model" in space "Sample". You must wait for the deployment to enter ready state before submitting requests. Today at 05:00 PM).

Deployments /

Sample  
for Nalayiathiran Project

Overview Assets Deployments Jobs Manage

Assets

- Power\_Prediction  
2 hours ago

[View all \(1\)](#)

Deployments

All

1 Deployed 0 Failed

[View deployments](#)

Job runs

0 Active 0 Failed last 24 hours

[View jobs](#)

Space activity

- Online deployment ready**  
The online deployment [Train The Model](#) in space [Sample](#) is ready to accept requests  
Today at 05:00 PM
- Online deployment created**  
You created online deployment ["Train The Model"](#) in space [Sample](#). You must wait for the deployment to enter ready state before submitting requests.  
Today at 05:00 PM

# API Reference In Deployments

Deployments / Sample / Power\_Prediction /

Train The Model Deployed Online

API reference

Test

Direct link

Endpoint Bearer <token>

https://us-south.ml.cloud.ibm.com/ml/v4/deployments/ca088e16-8237-4b30-9445-1d7974195e33/predictions?version=1

IAM

Code snippets

cURL

Java

JavaScript

Python

Scala

```
import requests

# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account.
API_KEY = "your API key"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey":
API_KEY, "grant_type": 'urn:ibm:params:oauth:grant-type:apikey'})
mltoken = token_response.json()["access_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

# NOTE: manually define and pass the array(s) of values to be scored in the next line
payload_scoring = {"input_data": [{"fields": [array_of_input_fields], "values": [array_of_values_to_be_scored, another_array_of_val

response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/ca088e16-8237-4b30-9445-1d7974195e33/predicti
headers={'Authorization': 'Bearer ' + mltoken})
```

Train The Model

Created  
Nov 17, 2022, 5:00 PM

Updated  
Nov 17, 2022, 5:00 PM

Deployment ID  
ca088e16-8237-4b30-9445-1d...

Software specification  
runtime-22.1-py3.9

Copies  
1

Serving name  
No serving name.

Description  
No description provided.

Tags  
Add tags to make assets easier to find.

Associated asset  
Power\_Prediction  
010ed9c8-50ea-4f0a-8b19-33a...

## Results for the Model in IBM Cloud

IBM Watson Studio

Search your workspace

Buy

Edit Jony P's Account

Dallas

Deployments / Sample / Power\_Prediction /

Train The Model

Prediction results

Prediction type

Regression

Prediction distribution

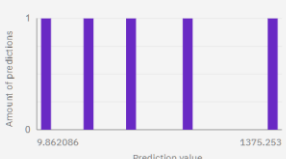


Table view

JSON view

	Prediction
1	336.05319865753154
2	528.5074870826161
3	1375.2531466611729
4	930.4506443873478
5	9.862086909495819
6	
7	
8	
9	
10	
11	
12	

Download

# Results for the Model in IBM Cloud in JSON view

