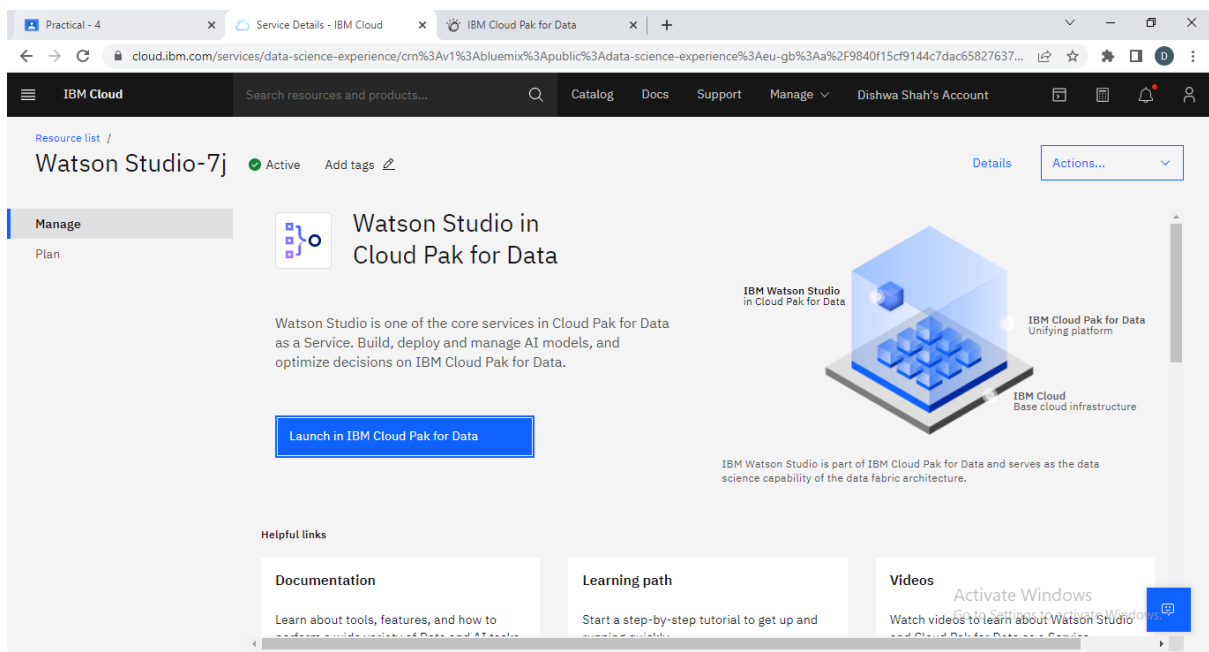


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B. Tech Computer Science and Engineering
Sub: Cognitive Computing (2CSE70E23)

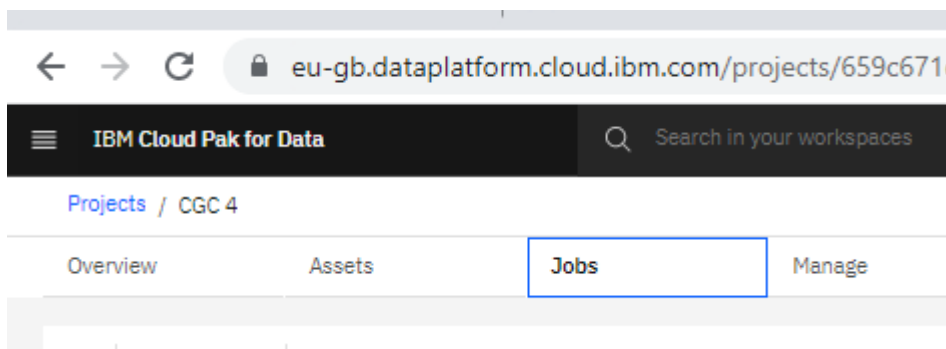
PRACTICAL 4

Jesal got a task from his team that he needs to deploy a machine learning model for the iris flower type. that can detect flower type as per the petal height and width. Use Watson Machine learning and Watson studio to train and deploy the model.

Go to IBM Cloud and search for Machine Learning. Go to Resource List and Launch in IBM Cloud Pak for Data.

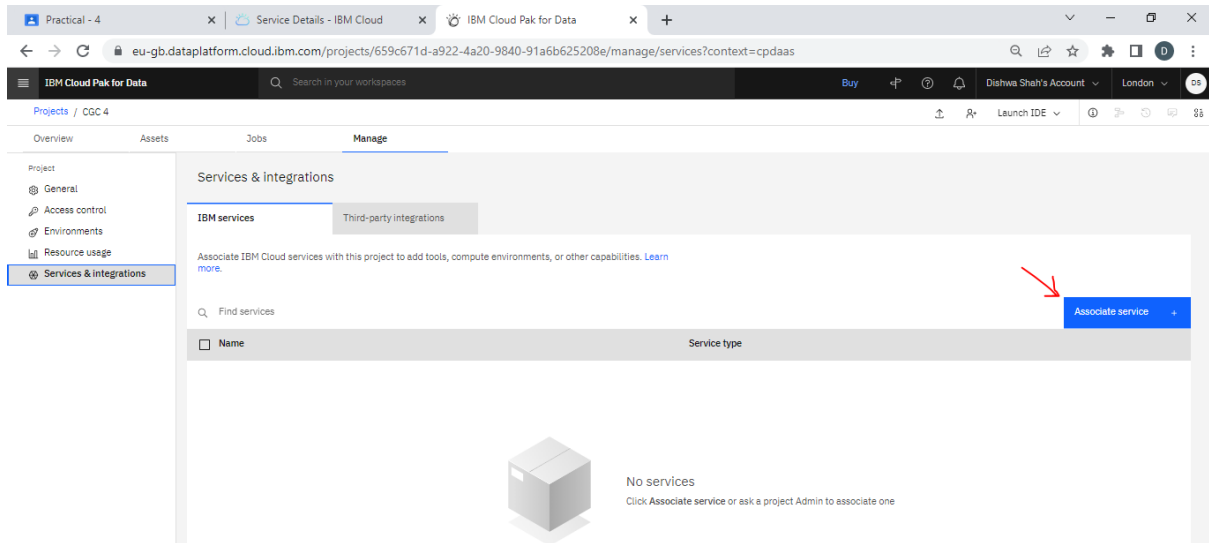


Create a new empty project and go to Jobs.



Jobs: Information regarding if there are any running jobs or not
Manage: Project managing things

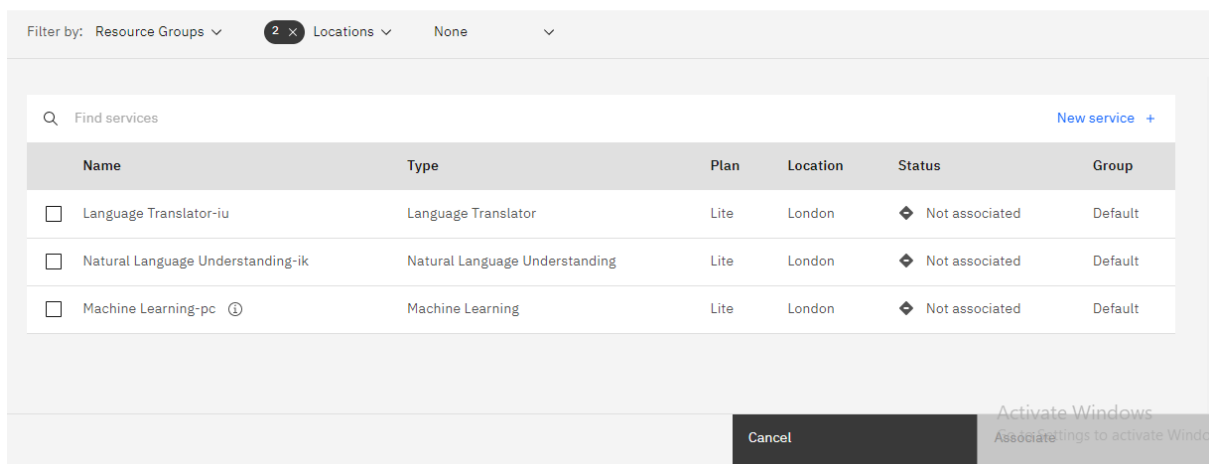
Go to Manage tab and go to Services and integrations and click on Associate services.



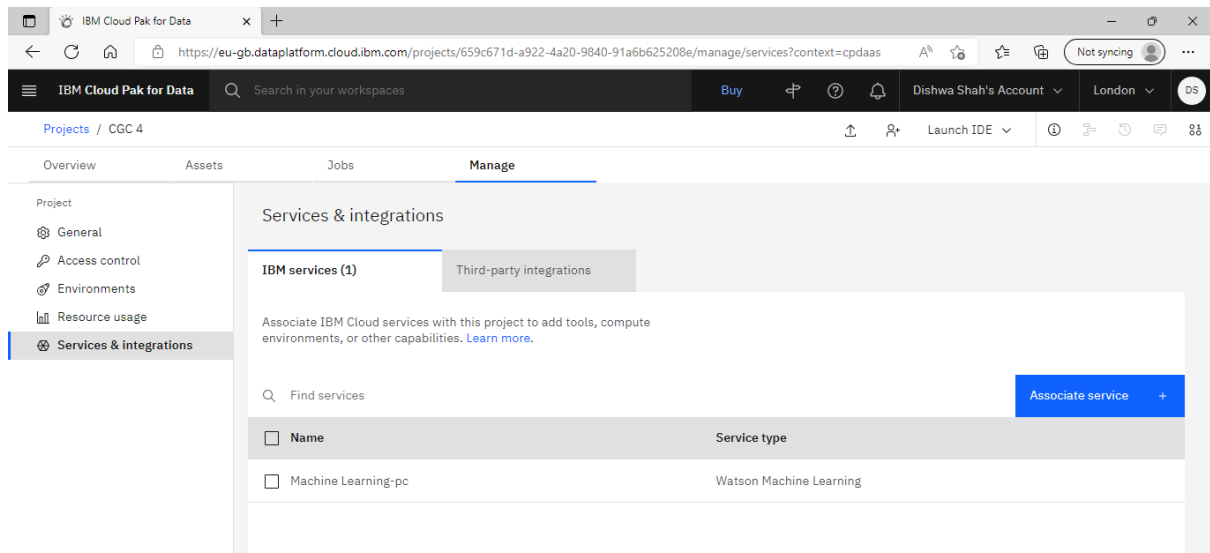
Select Machine Learning and Associate.

Associate service

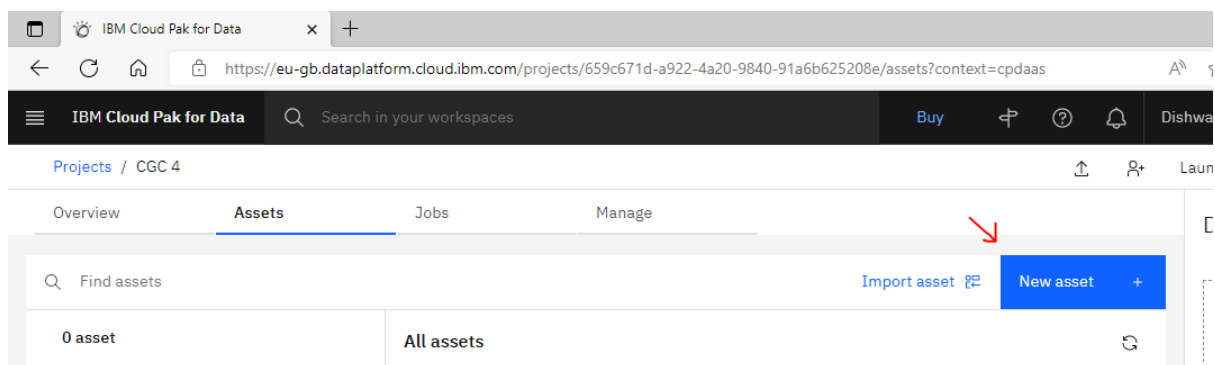
Choose an existing or add a new service to associate with your project.



Now, click on the associated service.



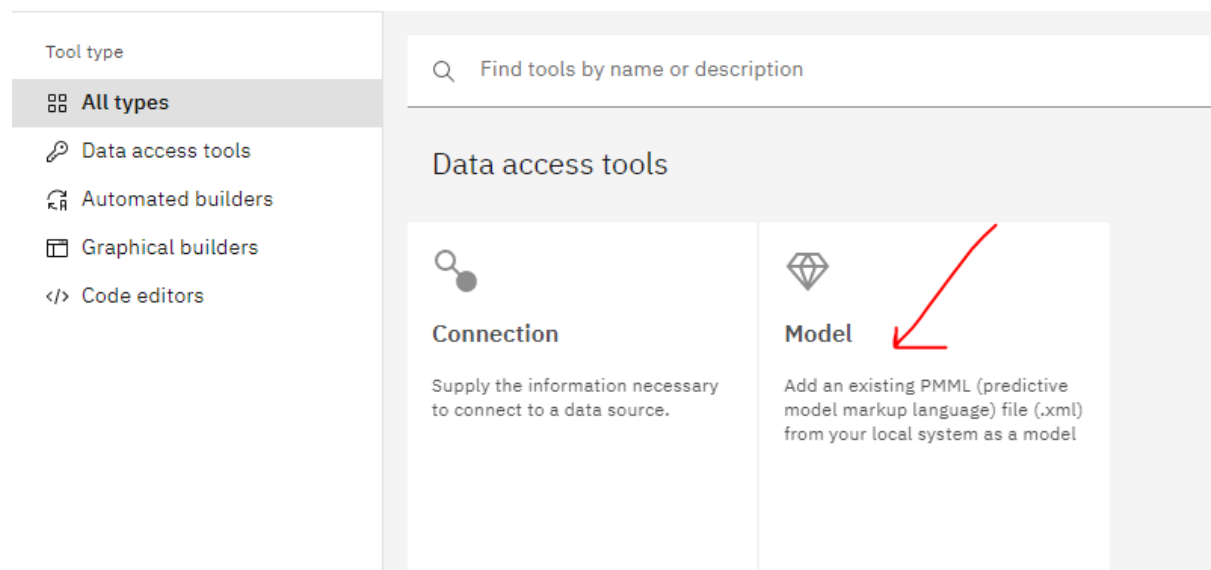
Go to Assets tab and create a New asset.



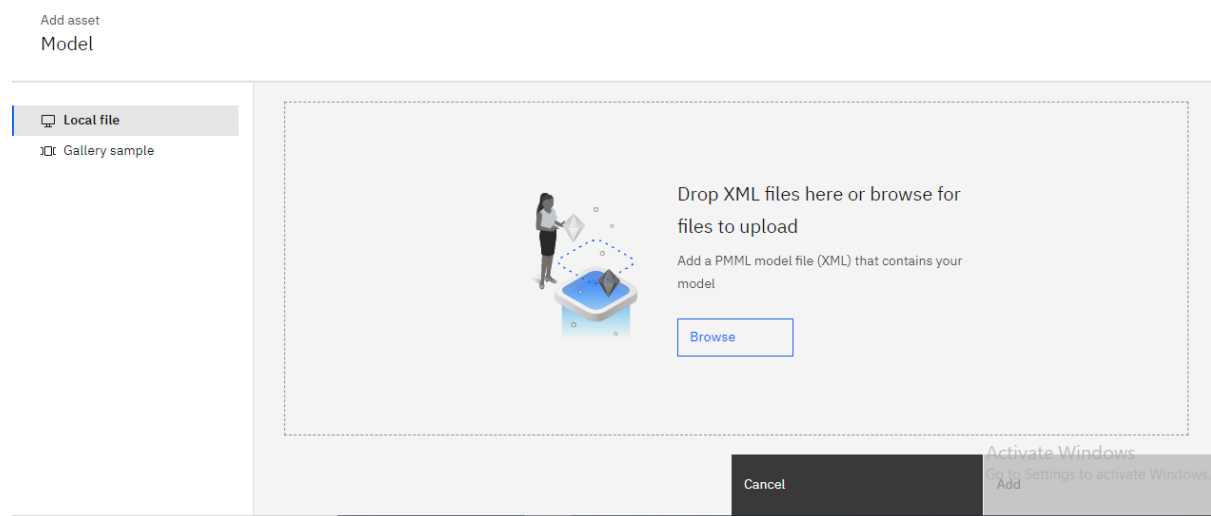
Select Model since we already have a pre-built model.

New asset

Select a tool based on what type of asset you want and how you want to work.



Browse the xml file and upload it.



As we can see, the model is successfully validated. Give it a name and click on Add.

Add asset
Model

Local file
Gallery sample

Define details

Local asset

iris_chaid_1 Model
Added

Name

Description (optional)

Cancel Add

Now, we want to deploy the model. Watson Studio already has a pre-built deployment space for our model. Click on Promote to deployment space.

Projects / CGC 4 / cgc 4

cgc 4 Promote to deployment space

Input Schema

Column	Type
Petal.Length	"double"
Petal.Width	"double"
Sepal.Length	"double"
Sepal.Width	"double"

Output

Column	Type
Species	"string"

cgc 4

Last modified at Aug 4, 2022 11:59 AM

Description
No description provided.

Created
Aug 4, 2022 11:59 AM

Type
pmml_4.2

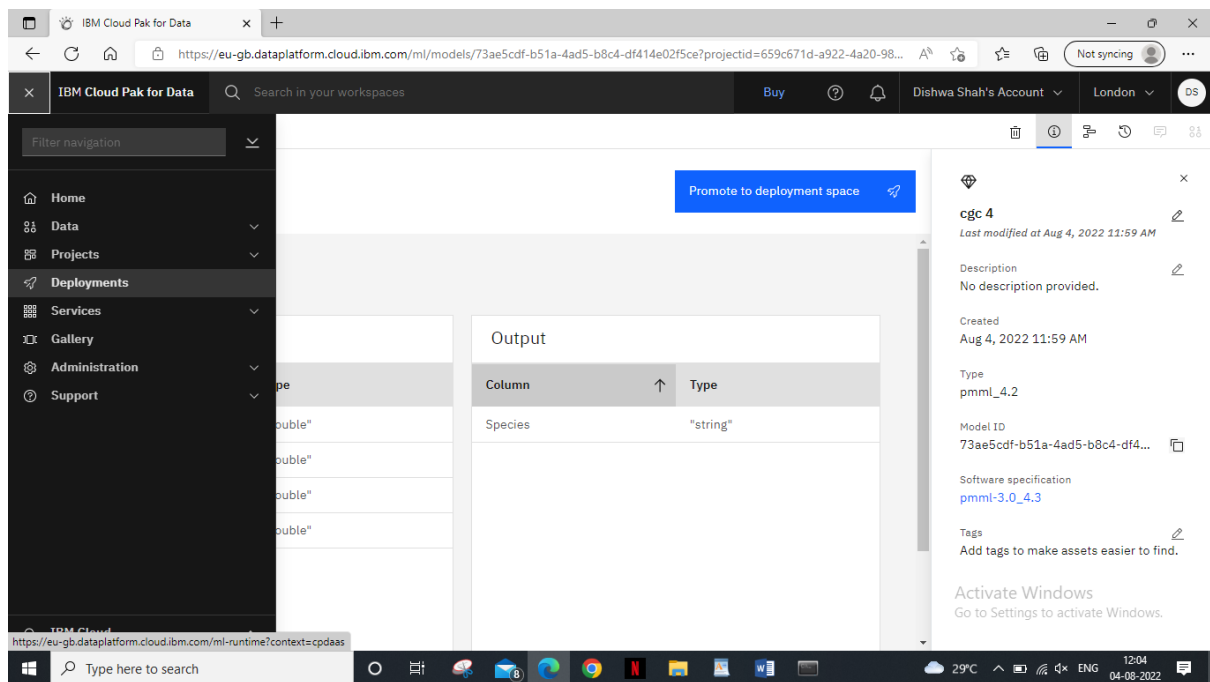
Model ID
73ae5cdf-b51a-4ad5-b8c4-df4...

Software specification
[pmml-3.0_4.3](#)

Tags
Add tags to make assets easier to find.

Activate Windows
Go to Settings to activate Windows.

OR Click on the burger menu and select Deployments.



The deployment space is now ready.

The space is ready

Close this notification to resume your work. Click **Deployments** in the navigation pane to view and access the new space.

✔ Step 1 of 1. Creating deployment space.

Close

Add details and select your ML model:

New deployment space

Use a space to collect assets in one place to create, run, and manage deployments

Define details

Name

Description (Optional)

Select services

Select storage service ⓘ

Cloud Object Storage-sh

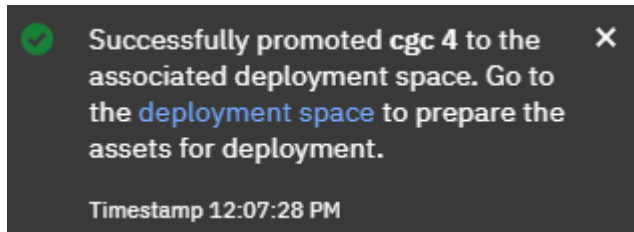
Select machine learning service (optional) ⓘ

Machine Learning-pc

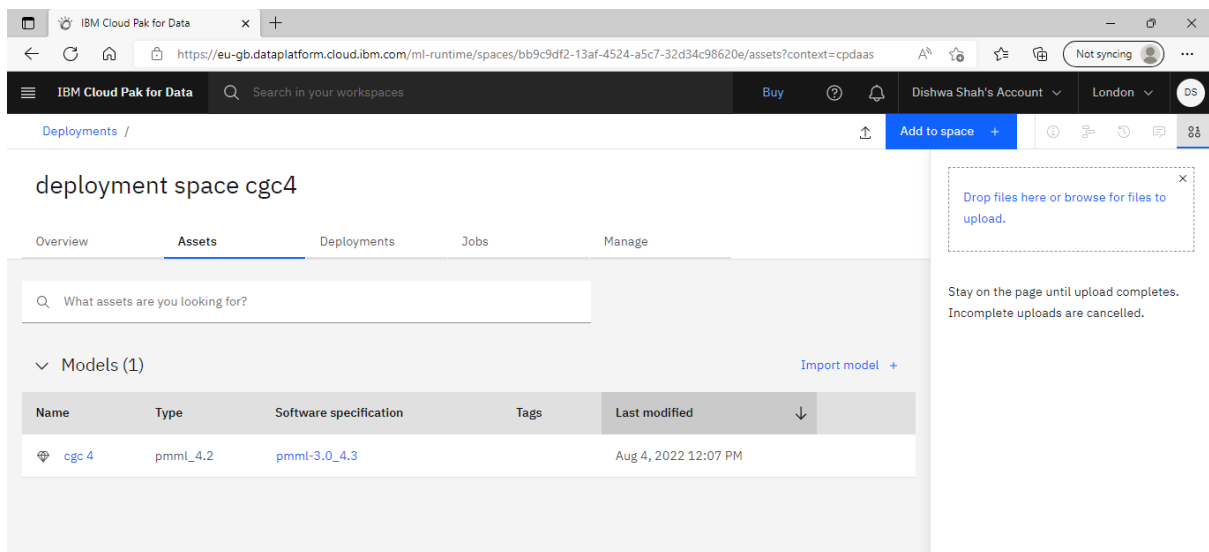
Cancel

Create

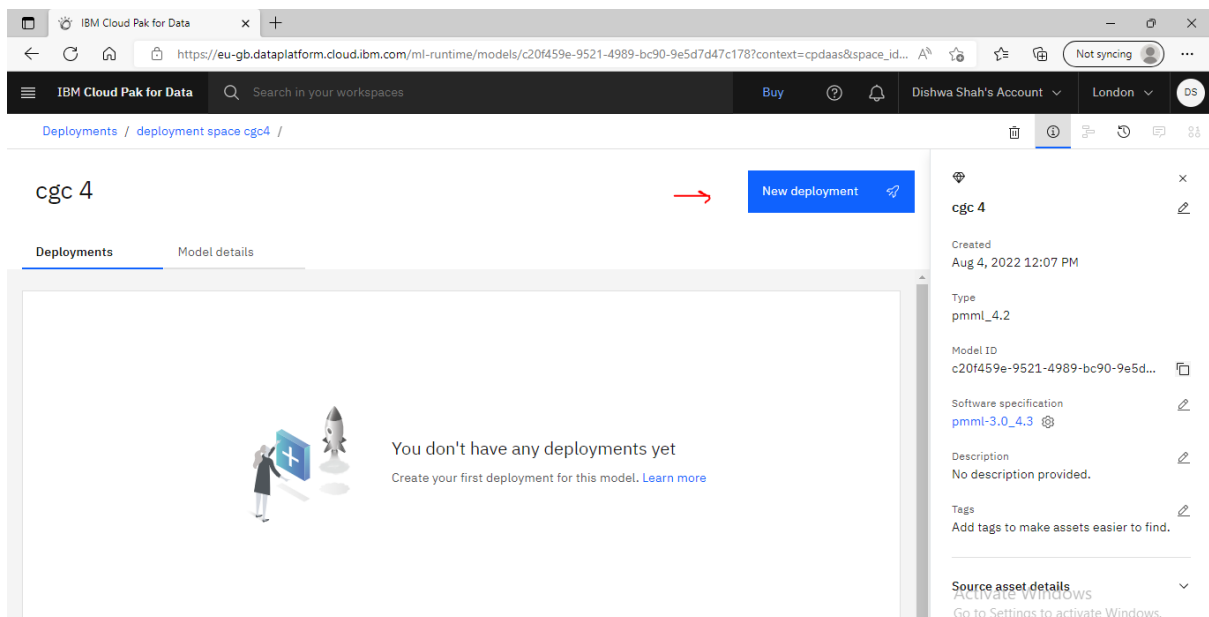
Click on the generated link to go to your deployment space:



Go to Assets and click on the model.



Click on New deployment.



Select Online Deployment type.

Create a deployment

Associated asset
cgC 4

Deployment type

Online
 Run the model on data in real-time, as data is received by a web service.

Batch
 Run the model against data as a batch process.

Name

Serving name ⓘ

Cancel Create

Click on the newly created deployment.

IBM Cloud Pak for Data

https://eu-gb.dataplatform.cloud.ibm.com/ml-runtime/models/c20f459e-9521-4989-bc90-9e5d7d47c178?context=cpdaas&space_id=...

IBM Cloud Pak for Data Search in your workspaces Buy ? Dishwa Shah's Account London DS

Deployments / deployment space cgC4 /

cgC 4 New deployment

Deployments Model details

DEPLOYMENT TYPES		1 Online Deployment(s)		
		Name	Status	Last modified
Online	(1)	deploy cgC4	Deployed	Aug 4, 2022 12:10 PM
Batch	(0)			

Source asset details

cgC 4

Created
Aug 4, 2022 12:07 PM

Type
pmml_4.2

Model ID
c20f459e-9521-4989-bc90-9e5d...

Software specification
pmml-3.0_4.3

Description
No description provided.

Tags
Add tags to make assets easier to find.

Go to Settings to activate Windows.

You can see the direct link here which you can use to connect to other tools. Also, various code snippets in different languages are available if you want to work in that language.

IBM Cloud Pak for Data

Deployments / deployment space cg4 / cg4 /

deploy cg4 Deployed Online

API reference Test

Direct link

Endpoint

`https://eu-gb.ml.cloud.ibm.com/ml/v4/deployments/293d5e94-0f85-4e81-9dfa-9c7e39d1ae3f/predictions?version=2022-08-04`

Bearer <token>

IAM

Code snippets

cURL Java JavaScript Python Scala

NOTE: you must set \$API_KEY below using information retrieved from your IBM Cloud account.

```
curl --insecure -X POST --header "Content-Type: application/x-www-form-urlencoded" --header "Accept: application/json" \
--data-urlencode "grant_type=urn:ibm:params:oauth:grant-type:apikey" \
--data-urlencode "apikey=$API_KEY" "https://iam.cloud.ibm.com/identity/token"
```

the above CURL request will return an auth token that you will use as \$IAM_TOKEN in the scoring request below
TODO: manually define and pass values to be scored below

```
curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: \
Bearer $IAM_TOKEN" -d '{"input_data": [{"fields": [$ARRAY_OF_INPUT_FIELDS], "values": [$ARRAY_OF_VALUES_TO_BE_SCORED,
```

Go to Test and take 10 cases.

IBM Cloud Pak for Data

Deployments / deployment space cg4 / cg4 /

deploy cg4 Deployed Online

API reference Test

Enter input data

Input Paste JSON

Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.

[Download CSV template](#) [Browse local files](#) [Search in space](#) [Clear all](#)

	Sepal.Length (double)	Sepal.Width (double)	Petal.Length (double)	Petal.Width (double)
2	9	8	7	6
3	10	5	3	1
4	7	4	5	3

[Predict](#)

Click on Predict. You can download the CSV template.

deploy cgc4_test_input - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do

Clipboard: Paste, Cut, Copy, Format Painter

Font: Calibri, 11, Bold, Italic, Underline, Text Color, Background Color

Alignment: Wrap Text, Merge & Center, Indent, Decrease Indent, Increase Indent

Number: General, Percentage, Currency, Accounting, Text, Scientific, Fraction, Date, Time, Custom

Formulas: fx, Sepal.Length

	A	B	C	D	E	F	G	H	I	J
1	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width						
2	5	6	7	8						
3	9	8	7	6						
4	10	5	3	1						
5	7	4	5	3						
6	1	1	1	1						
7	9	7	3	0						
8	10	56	43	11						
9	7	6	3	9						
10	0	4	2	8						
11	9	1	12	32						

Probability scores are displayed according to the species when you click on Predict. In the first column, it gives the predicted species.

cgc 4 test prediction

Table view JSON view

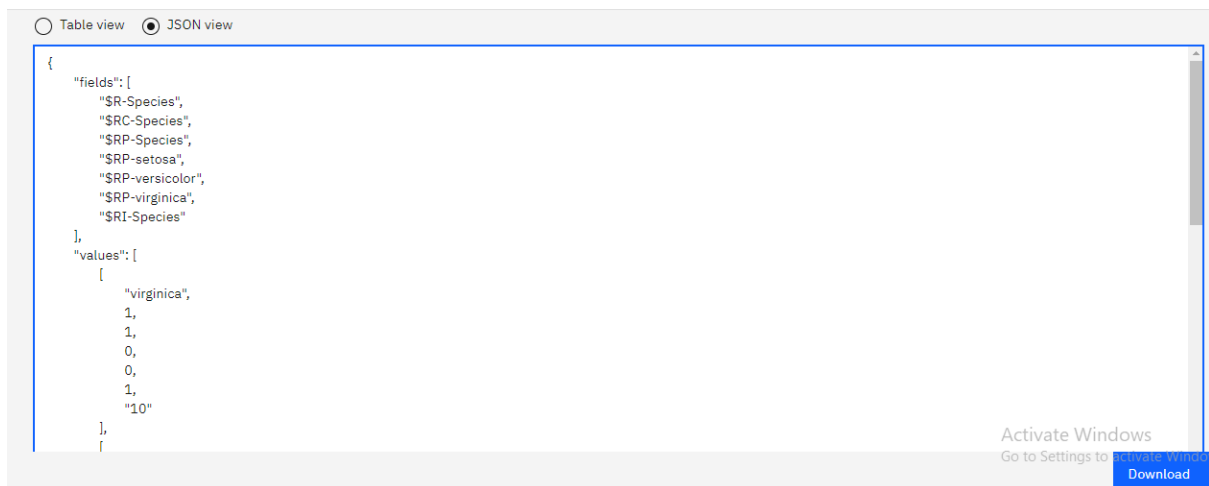
	\$R-Species	\$RC-Species	\$RP-Species	\$RP-setosa	\$RP-versicolor	\$RP-virginica	\$RI-Species
1	virginica	1	1	0	0	1	10
2	virginica	1	1	0	0	1	10
3	setosa	1	1	1	0	0	6
4	virginica	1	1	0	0	1	10
5	versicolor	1	1	0	1	0	5
6	setosa	1	1	1	0	0	1
7	virginica	1	1	0	0	1	10
8	virginica	0.833333333333...	0.833333333333...	0	0.166666666666...	0.833333333333...	9
9	virginica	0.833333333333...	0.833333333333...	0	0.166666666666...	0.833333333333...	9
10	virginica	1	1	0	0	1	10
11							
12							

Activate Windows
Go to Settings to activate Windows

Download

You can also go to the JSON view if you want to work with it.

cgc 4 test prediction



```
{
  "fields": [
    "$R-Species",
    "$RC-Species",
    "$RP-Species",
    "$RP-setosa",
    "$RP-versicolor",
    "$RP-virginica",
    "$RI-Species"
  ],
  "values": [
    [
      "virginica",
      1,
      1,
      0,
      0,
      1,
      "10"
    ]
  ]
}
```

Activate Windows
Go to Settings to activate Windows

Download

You can download the JSON file as well if you want.

```

1  {
2      "fields": [
3          "$R-Species",
4          "$RC-Species",
5          "$RP-Species",
6          "$RP-setosa",
7          "$RP-versicolor",
8          "$RP-virginica",
9          "$RI-Species"
10     ],
11     "values": [
12         [
13             "virginica",
14             1,
15             1,
16             0,
17             0,
18             1,
19             "10"
20         ],
21         [
22             "virginica",
23             1,
24             1,
25             0,
26             0,
27             1,
28             "10"
29         ],
30         [
31             "setosa",
32             1,
33             1,
34             1

```

JSON file

This is the predicted output generated:

```

{
  "fields": [
    "$R-Species",
    "$RC-Species",
    "$RP-Species",
    "$RP-setosa",
    "$RP-versicolor",

```

```
    "$RP-virginica",
    "$RI-Species"
  ],
  "values": [
    [
      "virginica",
      1,
      1,
      0,
      0,
      1,
      "10"
    ],
    [
      "virginica",
      1,
      1,
      0,
      0,
      1,
      "10"
    ],
    [
      "setosa",
      1,
      1,
      1,
      0,
      0,
      "6"
    ],
    [
      "virginica",
      1,
      1,
      0,
      0,
      1,
      "10"
    ],
    [
      "versicolor",
      1,
      1,
      0,
      1,
      0,
      "5"
    ]
  ]
}
```

```

    ],
    [
        "setosa",
        1,
        1,
        1,
        0,
        0,
        "1"
    ],
    [
        "virginica",
        1,
        1,
        0,
        0,
        1,
        "10"
    ],
    [
        "virginica",
        0.8333333333333333,
        0.8333333333333333,
        0,
        0.1666666666666667,
        0.8333333333333333,
        "9"
    ],
    [
        "virginica",
        0.8333333333333333,
        0.8333333333333333,
        0,
        0.1666666666666667,
        0.8333333333333333,
        "9"
    ],
    [
        "virginica",
        1,
        1,
        0,
        0,
        1,
        "10"
    ]
]
}

```