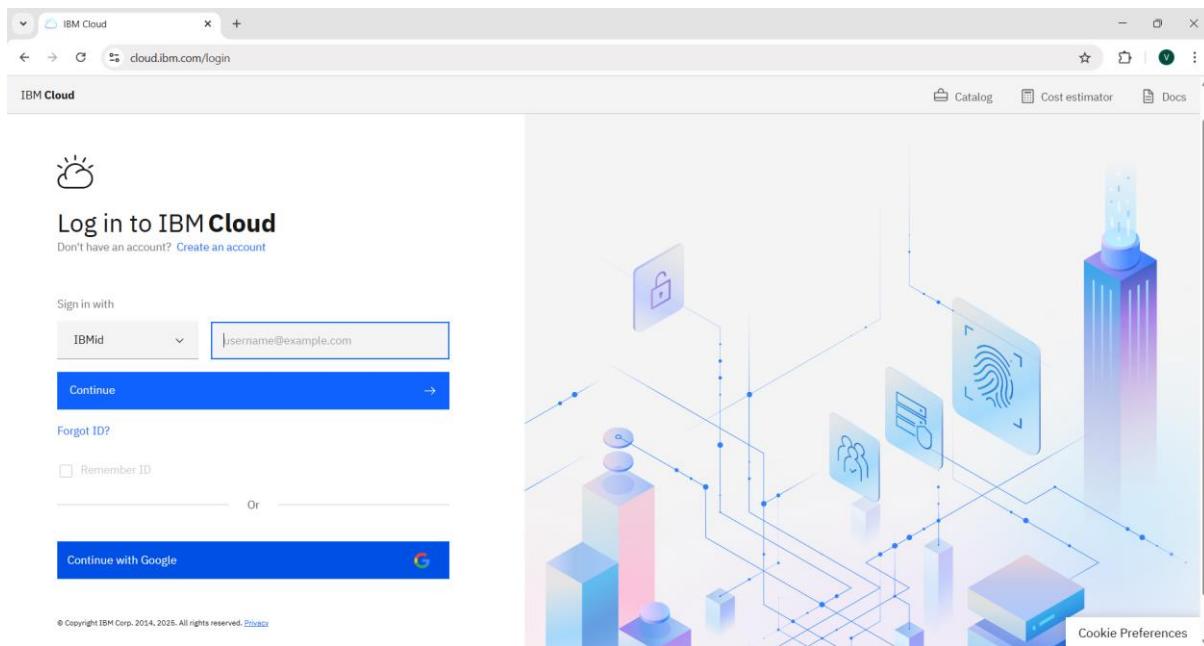


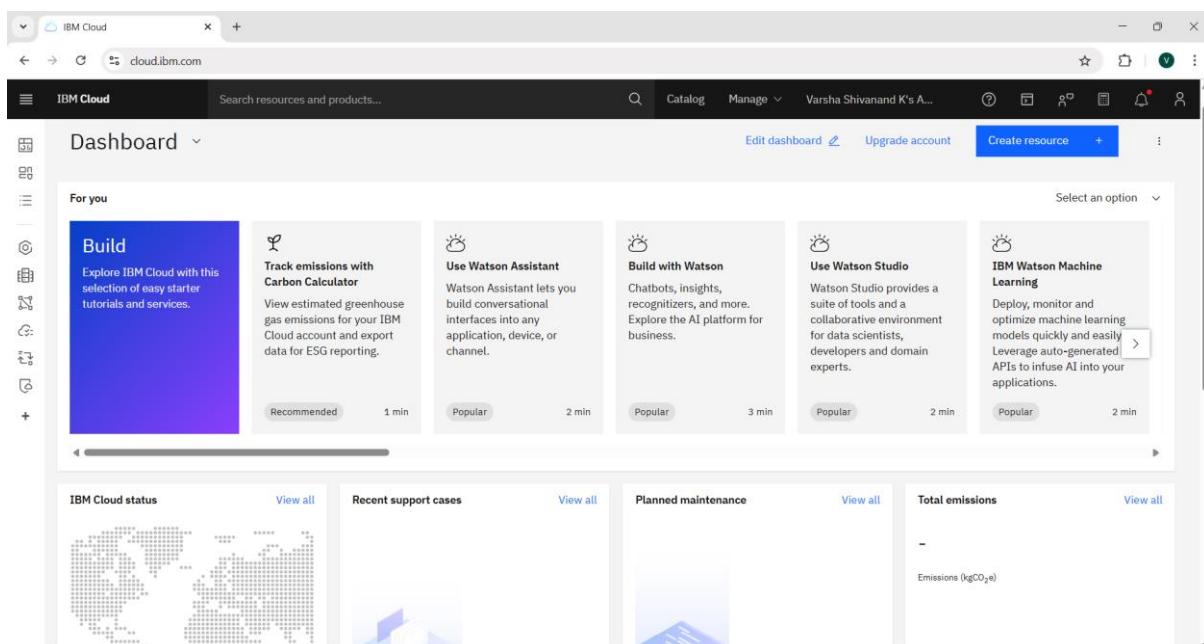
CAPSTONE PROJECT EXECUTION STEPS & SCREENSHOTS

Submitted By : VARSHA SHIVANAND K

Step 1 : Login to IBM Cloud – cloud.ibm.com/login



Step 2 : This is IBM Cloud Dashboard



Step 3 : Click on Navigation Menu, go to Resources List and clear all the resources

The screenshot shows the IBM Cloud Resource list interface. On the left, there is a navigation sidebar with various service categories like Dashboard, Projects, Resource list, Containers, Databases, Infrastructure, Observability, Platform Automation, Security, API Management, Cloud Pak for Data, Partner Center, SAP, Satellite, VMware, and Watsonx. Below this is a link to 'Browse all services...'. The main area features a table with columns: Group, Location, Product, Status, and Tags. The table has several rows, each representing a resource group. At the top of the table, there are search and filter fields for Address, Group, Location, Product, Status, and Tags. A 'Create resource' button is located in the top right corner of the main content area.

This screenshot shows the same IBM Cloud Resource list interface, but the 'Resource list' item in the navigation sidebar is now selected, causing the main content area to change. The main area now displays a hierarchical list of resource categories under the heading 'Resource list'. The categories listed are Compute (0), Containers (0), Networking (0), Storage (0), Converged infrastructure (0), Enterprise applications (0), AI / Machine Learning (0), Analytics (0), Blockchain (0), Databases (0), Developer tools (0), and Observability (0). Each category entry includes a small icon and a '(0)' indicating no resources currently exist in that category. The rest of the interface, including the navigation bar and the table at the top, remains the same as the previous screenshot.

Step 4 : Click on search icon and type “watsonx.ai Studio”. Select watsonx.ai Studio (Service)

Watsonx.ai Studio

Watsonx.ai Studio Service

Watsonx.ai Service

NeuralSeek Service

Cloud automation for watsonx.ai Software

Watsonx.ai SaaS with Assistant and Governance Software

Check the entire catalog

Build with Watson

Use Watson Studio

Step 5 : Select a location, then click on the check box and Create.

Watsonx.ai Studio

(Formerly known as Watson Studio) Develop powerful AI solutions with an integrated collaborative studio and industry-standard APIs and SDKs.

Create

Type: Service

Provider: IBM

Last updated: 05/06/2025

Category: AI / Machine Learning

Compliance: HIPAA Enabled, IAM-enabled

Location: Sydney (au-syd), Frankfurt (eu-de), London (eu-gb), Tokyo (jp-tok), Dallas (us-south), Toronto (ca-tor)

Select a location: London (eu-gb)

Select a pricing plan: United States

Plan: Lite

Features and capabilities:

- 1 authorized user
- 10 capacity unit-hours monthly limit
- Environment = # of capacity units required per hour
 - 1 vCPU + 4 GB RAM = 0.5
 - 2 vCPU + 8 GB RAM = 1
 - 4 vCPU + 16 GB RAM = 2
 - Decision Optimization + Watson NLP = Environment + 5
 - Synthetic Data Generator, 2 vCPU + 8 GB RAM = 7 (requires

Pricing: Free

Summary

watsonx.ai Studio

Location: London (eu-gb)

Plan: Lite

Service name: watsonx.ai Studio-eu

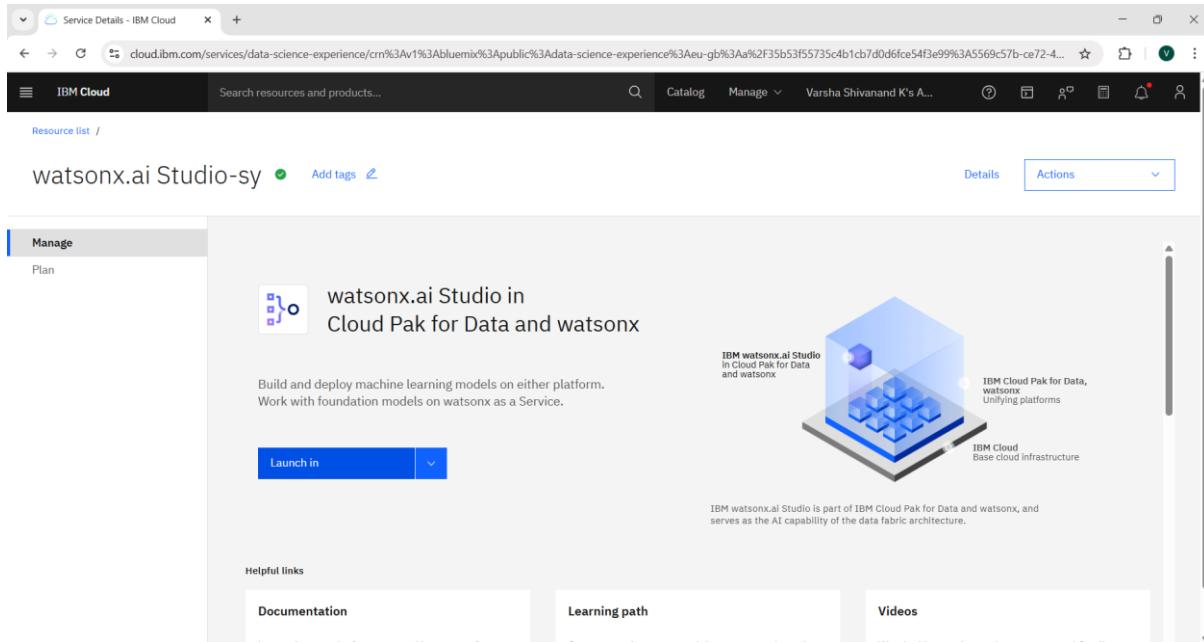
Resource group: Default

I have read and agree to the following license agreements: Terms

Create

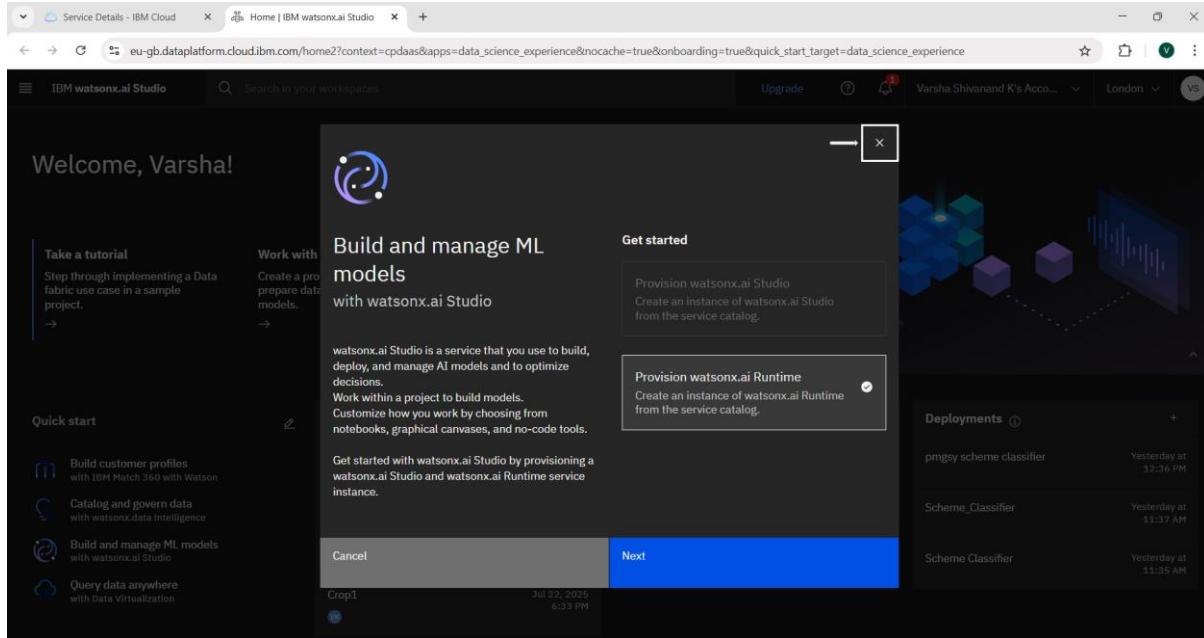
Add to estimate

Step 6 : Click on Launch in



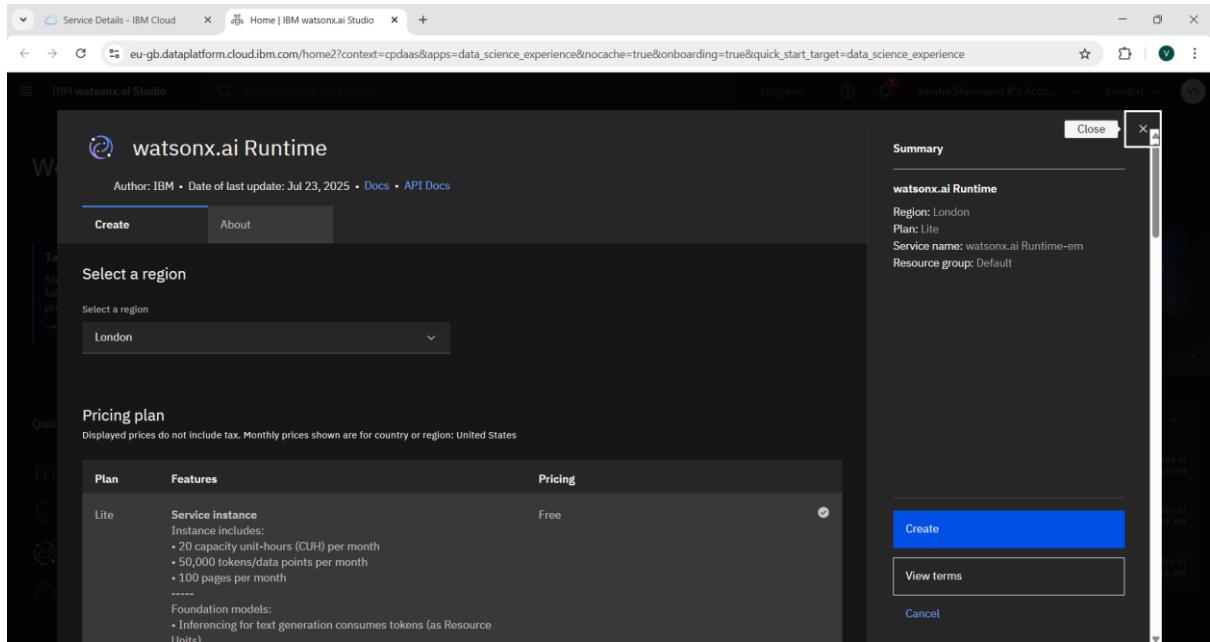
The screenshot shows the IBM Cloud Service Details page for a service named "watsonx.ai Studio-sy". The top navigation bar includes "IBM Cloud", "Search resources and products...", "Catalog", "Manage", and a user profile. Below the search bar, there's a "Resource list" link and an "Add tags" button. On the left, a sidebar titled "Manage" has a "Plan" section. The main content area features a title "watsonx.ai Studio in Cloud Pak for Data and watsonx" with a blue icon. It describes the service as building and deploying machine learning models on either platform, working with foundation models on watsonx as a Service. A large diagram illustrates the architecture, showing "IBM watsonx.ai Studio in Cloud Pak for Data and watsonx" at the top, resting on "IBM Cloud Pak for Data, watsonx Unifying platforms", which sits atop "IBM Cloud Base cloud Infrastructure". A "Launch in" button is prominently displayed. Below the diagram, a note states: "IBM watsonx.ai Studio is part of IBM Cloud Pak for Data and watsonx, and serves as the AI capability of the data fabric architecture." At the bottom, there are "Helpful links" for "Documentation", "Learning path", and "Videos".

Step 7 : Select Provision watsonx.ai Runtime and click on Next.

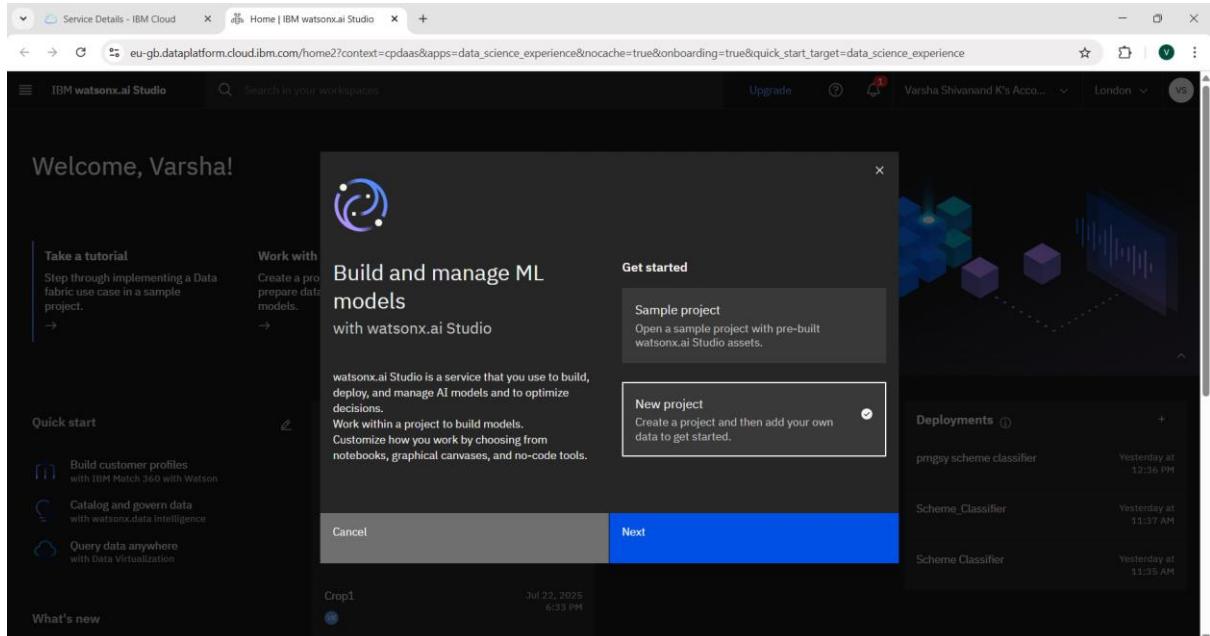


The screenshot shows the IBM Watsonx.ai Studio interface. The top navigation bar includes "IBM Watsonx.ai Studio", "Home | IBM Watsonx.ai Studio", and a user profile. The main area has a dark background with a central callout box. The callout box contains the text "Build and manage ML models with watsonx.ai Studio" and "watsonx.ai Studio is a service that you use to build, deploy, and manage AI models and to optimize decisions. Work within a project to build models. Customize how you work by choosing from notebooks, graphical canvases, and no-code tools." Below this, there are two buttons: "Provision watsonx.ai Studio" and "Provision watsonx.ai Runtime". The "Provision watsonx.ai Runtime" button is highlighted with a blue border and has a checked radio button next to it. To the right of the callout box, there's a "Get started" section with a "Deployments" table listing three entries: "pmggy scheme classifier", "Scheme_Classifier", and "Scheme Classifier", each with a timestamp. At the bottom of the callout box, there are "Cancel" and "Next" buttons, with "Next" being the active button. The sidebar on the left lists various workspace options like "Take a tutorial", "Work with", "Quick start", and "Query data anywhere".

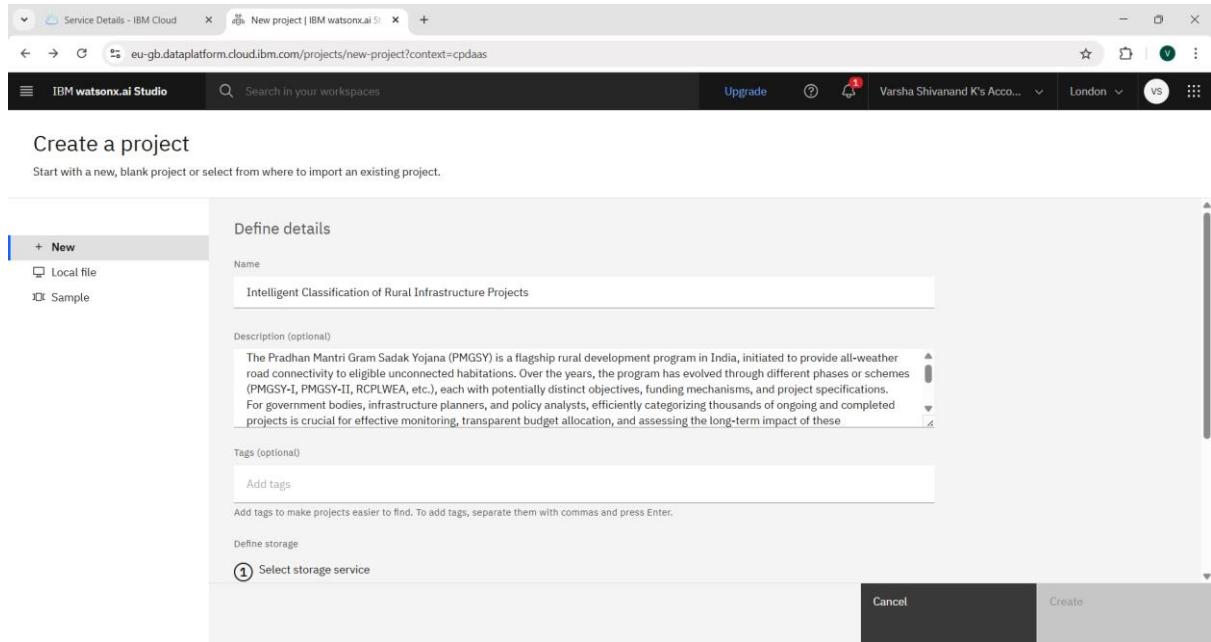
Step 8 : Click on Create



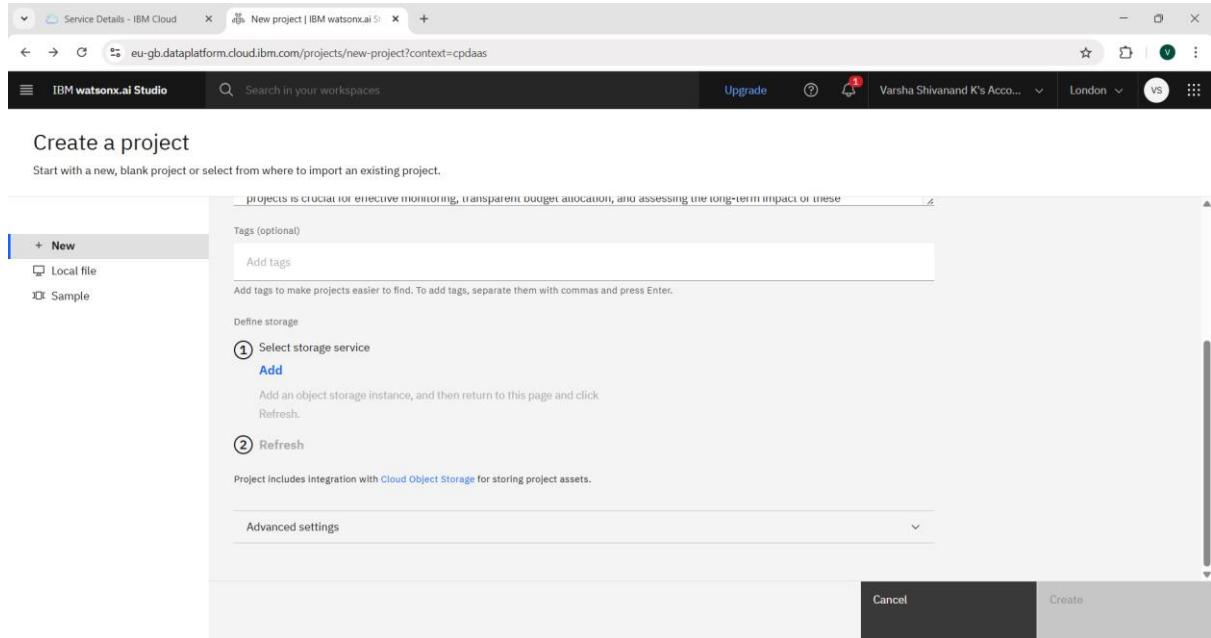
Step 9 : Select New project and click on Next.



Step 10 : Enter Project Name, Description and scroll a little.



Step 11 : Click on Add



Step 12 : Select Lite plan, Click on Create

The screenshot shows the IBM Watsonx.ai Studio interface. In the center, there's a table titled 'Pricing plan' comparing three plans: One-Rate, Lite(deprecated), and Standard. The 'Lite(deprecated)' plan is highlighted with a blue border. To the right of the table, a vertical sidebar displays the 'Cloud Object Storage' summary, including its region (Global), plan (Lite(deprecated)), service name (Cloud Object Storage-gv), and resource group (Default). At the bottom right of the main area, there are 'Create', 'View terms', and 'Cancel' buttons.

Step 13 : Click on Refresh and then click on Create.

The screenshot shows the 'Create a project' dialog in the IBM Watsonx.ai Studio. On the left, there's a sidebar with options like '+ New', 'Local file', and 'Sample'. The main area has sections for 'Tags (optional)', 'Define storage', and 'Advanced settings'. Step 13 is marked with a red circle around the '② Refresh' button. A note at the bottom states: 'Project includes Integration with Cloud Object Storage for storing project assets.' At the bottom right, there are 'Cancel' and 'Create' buttons.

Create a project

Start with a new, blank project or select from where to import an existing project.

Description (optional)

The Pradhan Mantri Gram Sadak Yojana (PMGSY) is a flagship rural development program in India, initiated to provide all-weather road connectivity to eligible unconnected habitations. Over the years, the program has evolved through different phases or schemes (PMGSY-I, PMGSY-II, RCPWEA, etc.), each with potentially distinct objectives, funding mechanisms, and project specifications. For government bodies, infrastructure planners, and policy analysts, efficiently categorizing thousands of ongoing and completed projects is crucial for effective monitoring, transparent budget allocation, and assessing the long-term impact of these

Tags (optional)

Add tags

Add tags to make projects easier to find. To add tags, separate them with commas and press Enter.

Storage

Cloud Object Storage-gv

Project includes integration with Cloud Object Storage for storing project assets.

Advanced settings

Cancel Create

Step 14 : Click on Manage, then Services & integrations and then click on Associate Service.

Service Details - IBM Cloud

eu-gb.dataplatform.cloud.ibm.com/projects/c00624b5-8f0f-4b78-abf9-02b4c5fc0ec5/manage/services?context=cpdaas

IBM watsonx.ai Studio

Projects / Intelligent Classification of Rural Infrastructure Projects

Manage

Services & integrations

IBM services

Third-party integrations

Find services

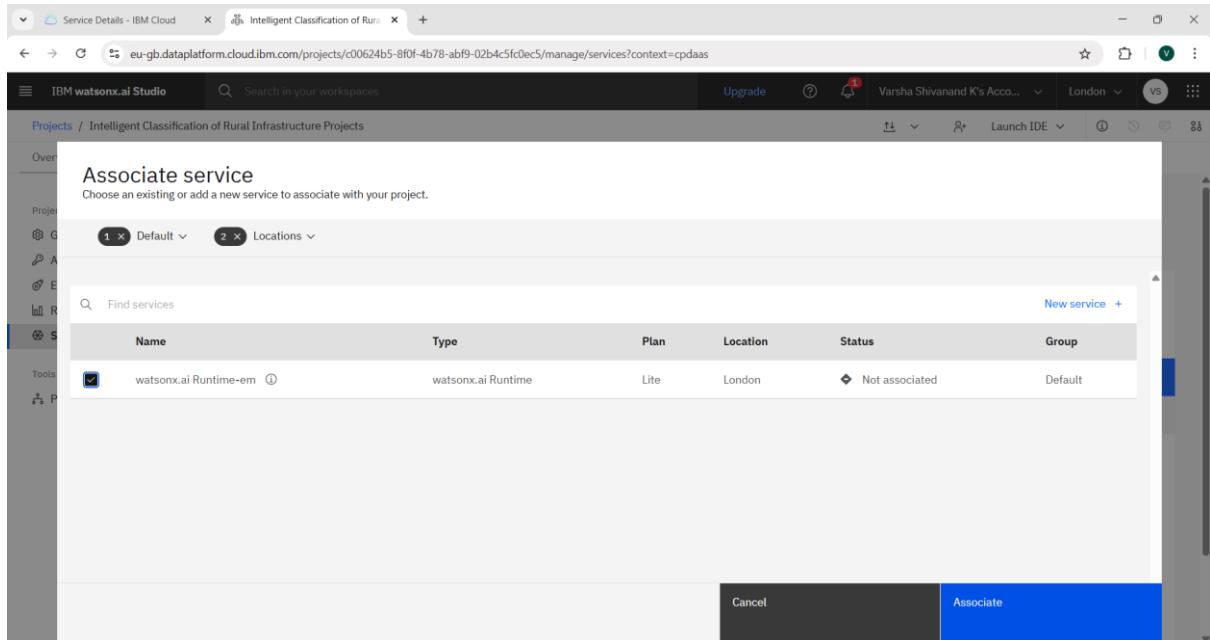
Name	Service type

Associate service

No services

Click **Associate service** or ask a project Admin to associate one

Step 15 : Click on the watsonx.ai Runtime and Associate

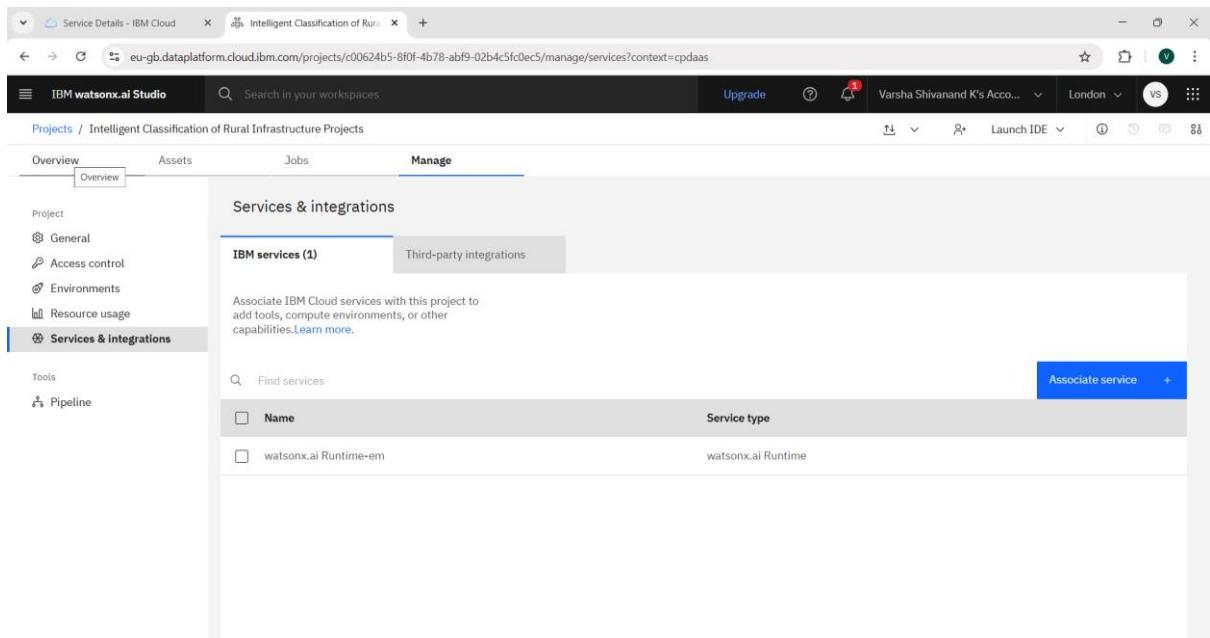


The screenshot shows the 'Associate service' dialog in the IBM Watsonx.ai Studio. It lists a single service entry:

Name	Type	Plan	Location	Status	Group
watsonx.ai Runtime-em	watsonx.ai Runtime	Lite	London	Not associated	Default

At the bottom right of the dialog are two buttons: 'Cancel' and 'Associate'. The 'Associate' button is highlighted with a blue background.

Step 16 : Watsonx.ai Runtime service is associated, now click on Overview



The screenshot shows the 'Overview' tab selected in the IBM Watsonx.ai Studio interface. The 'Services & integrations' section displays the following information:

- IBM services (1)**: Shows the associated 'watsonx.ai Runtime' service.
- Third-party integrations**: Shows no results.

Below the service list is a search bar labeled 'Find services' and a table listing the service details:

Name	Service type
watsonx.ai Runtime-em	watsonx.ai Runtime

At the top right of the integration list, there is a blue button labeled 'Associate service'.

Step 17 : Click on Build Machine Learning Models Automatically

The screenshot shows the IBM Watsonx.ai Studio interface. At the top, there's a navigation bar with tabs for 'Upgrade', 'Search in your workspaces', 'Varsha Shivanand K's Acco...', 'London', and 'Launch IDE'. Below the navigation is a breadcrumb path 'Projects / Intelligent Classification of Rural Infrastructure Projects'.

The main area is titled 'Start working' and contains four cards:

- 'Add users as collaborators' →
- 'Add data to work with' →
- 'Work with data and models in Python or R notebooks' →
- 'Build machine learning models automatically' →

Below these cards is a section titled 'View all' with three sub-sections: 'Assets' (By all), 'Resource usage' (0 CUH), and 'Your documentation' (New!).

The 'Your documentation' section includes a link 'Open Documentation editor'.

At the bottom right, there's a 'Project history' section.

Step 18 : Enter the experiment name and click on Create

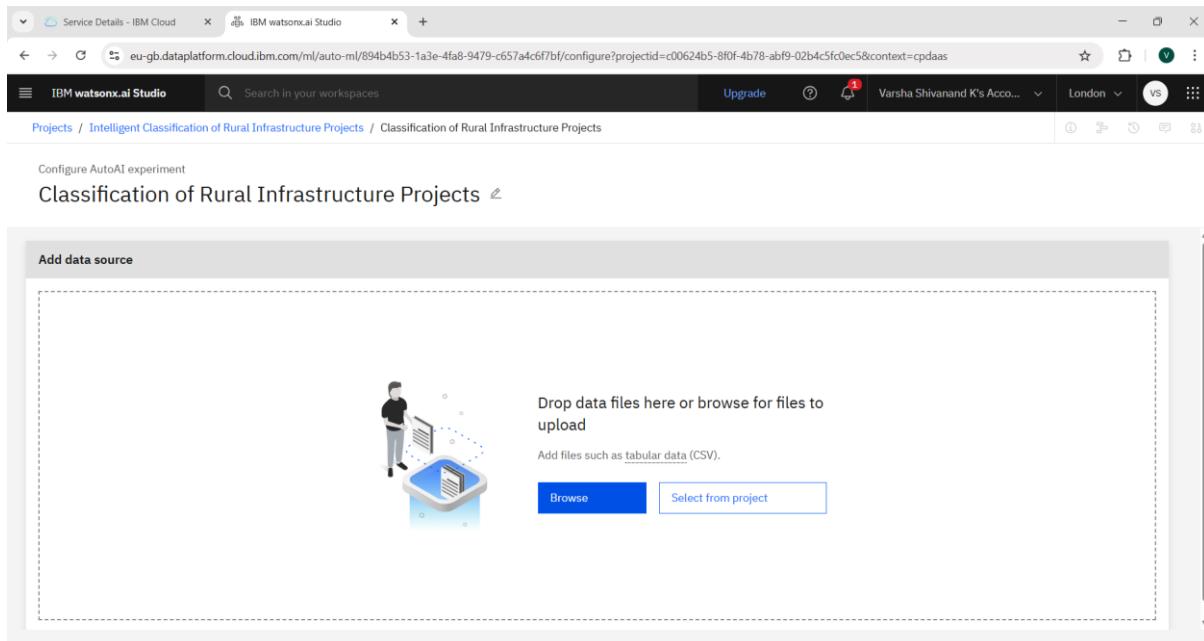
The screenshot shows the 'Build machine learning models automatically' configuration screen. The left sidebar has tabs for 'Overview', 'Start', 'Assets', and 'View'. The 'Overview' tab is selected.

The main area is titled 'Build machine learning models automatically' and contains two main sections:

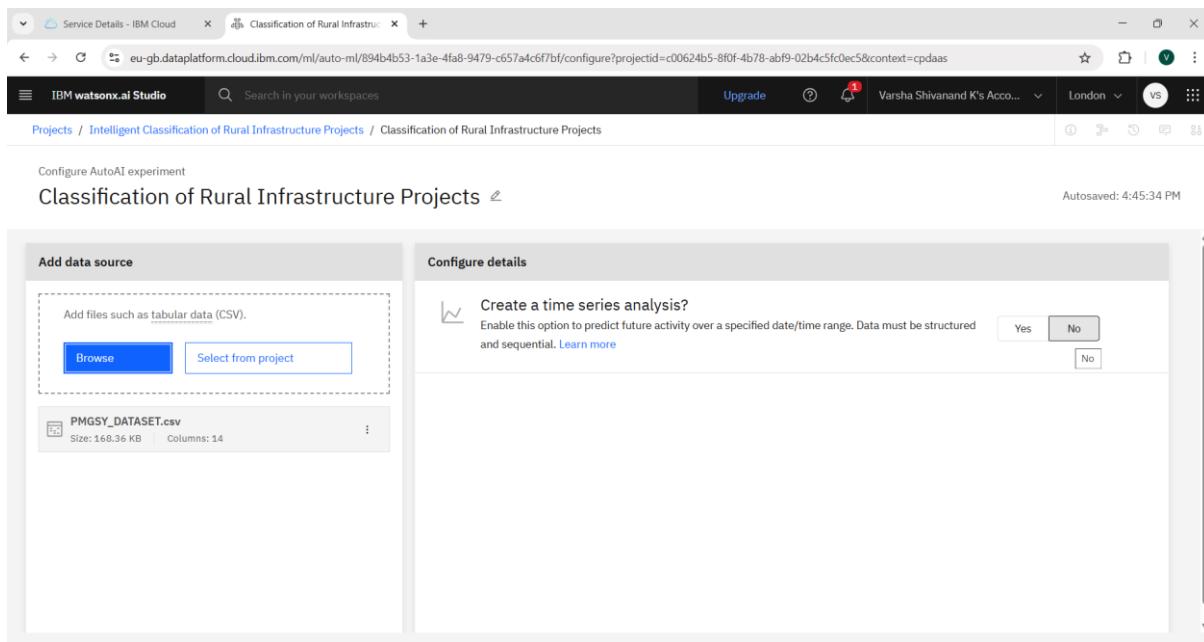
- Define details**:
 - Name: Classification of Rural Infrastructure Projects
 - Description (optional): This is a machine learning model that can automatically classify a road or bridge construction project into its correct PMGSY_SCHEME based on its physical and financial characteristics.
 - Tags (optional): Add tags to make assets easier to find. A text input field says 'Start typing to add tags'.
- Define configuration**:
 - Name: watsonx.ai Runtime service instance
 - Runtime environment: watsonx.ai Runtime-env
 - Environment definition: Large: 8 CPU and 32 GB RAM
 - A note states: This environment definition consumes 20 capacity units per hour for training. For details, see [watsonx.ai Runtime plans](#).

At the bottom right, there are 'Cancel', 'Back', and a large blue 'Create' button.

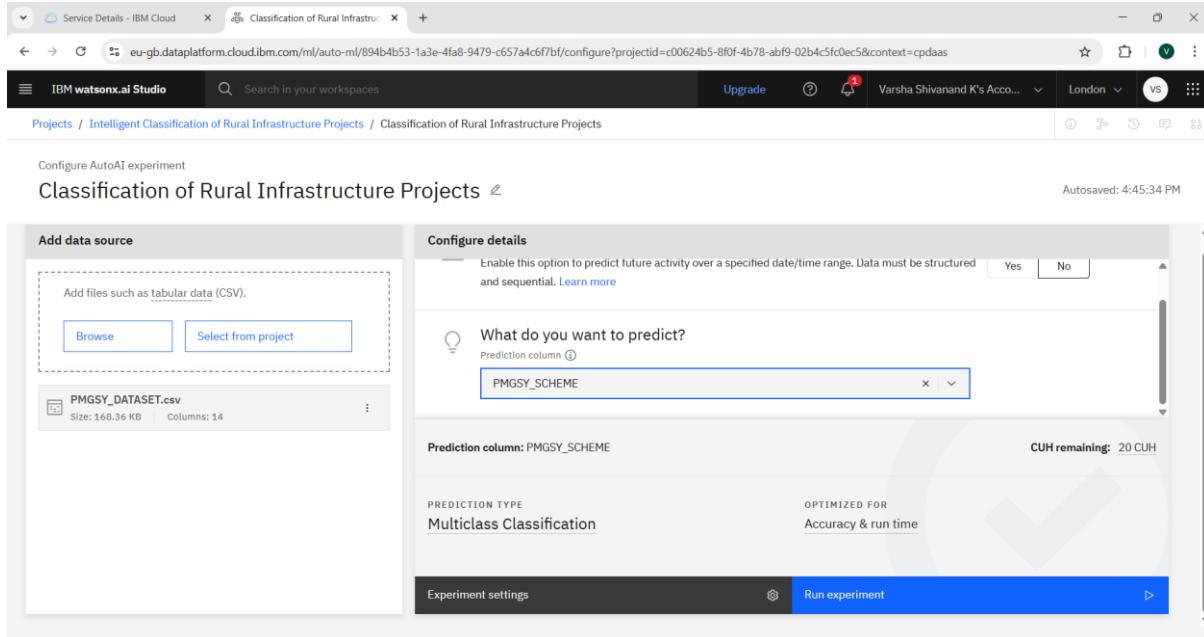
Step 19 : Add the dataset (PMGSY_DATASET.csv) downloaded from https://aikosh.indiaai.gov.in/web/datasets/details/pradhan_mantri_gra_m_sadak_yojna_pmgsy.html with the help of Browse Option



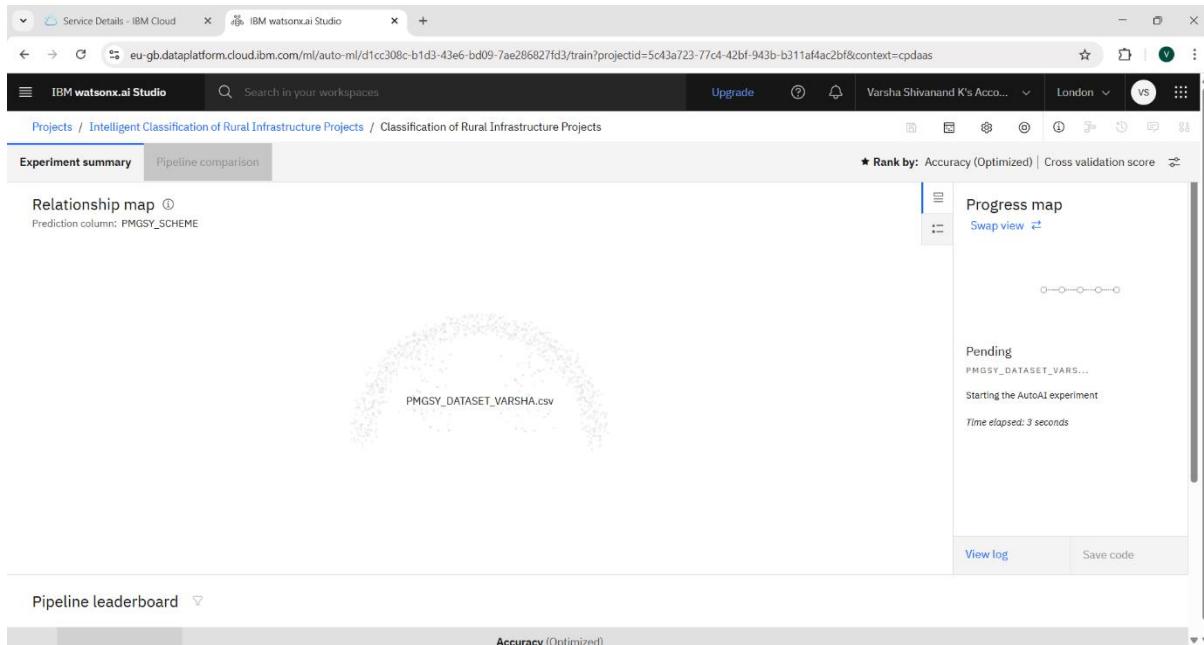
Step 20 : After uploading the dataset, in time-series analysis section, click on No



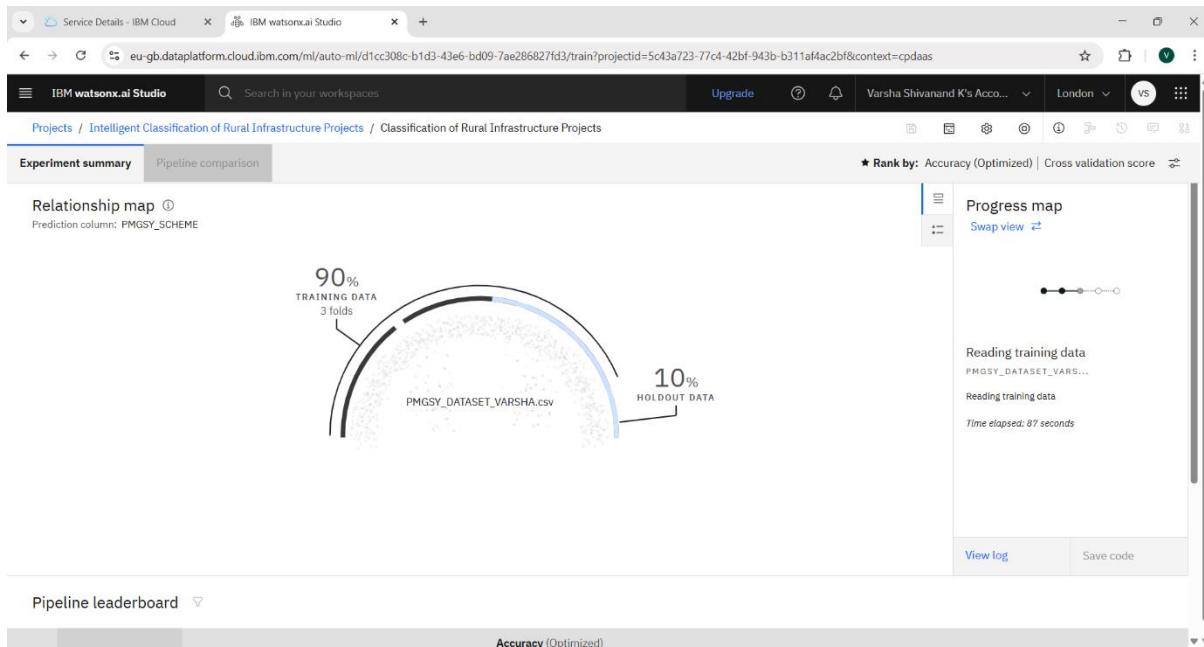
Step 21 : In Prediction column dropdown, select PMGSY_SCHEME and click on Run Experiment.



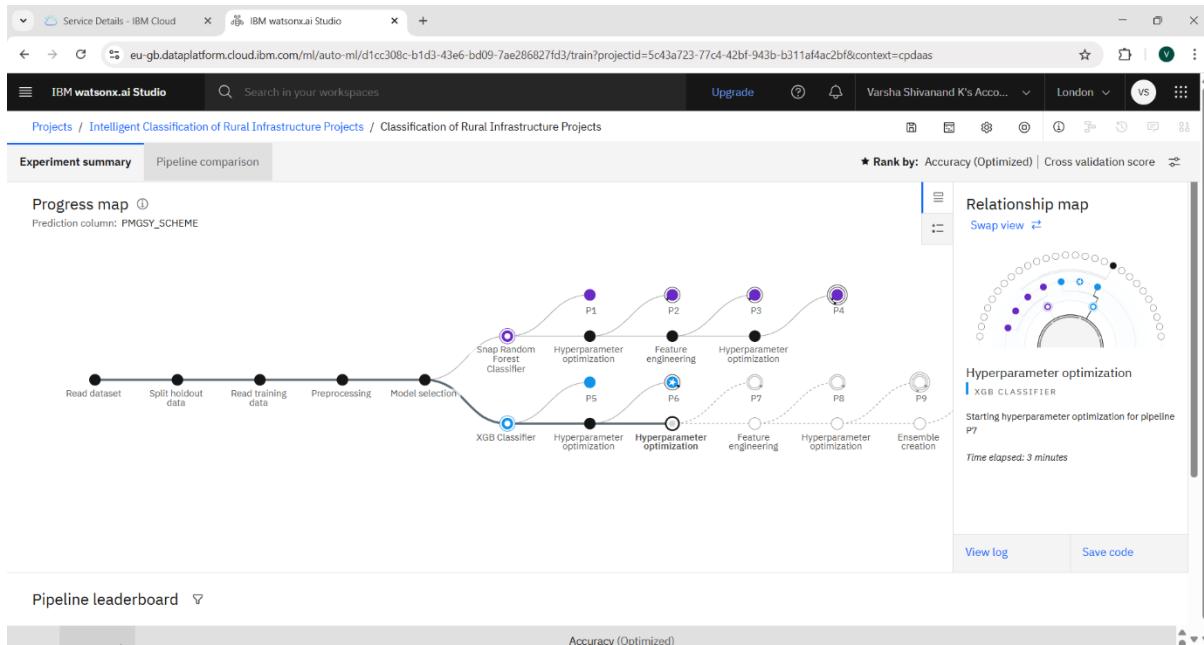
Step 22 : Auto AI Experiment is running.

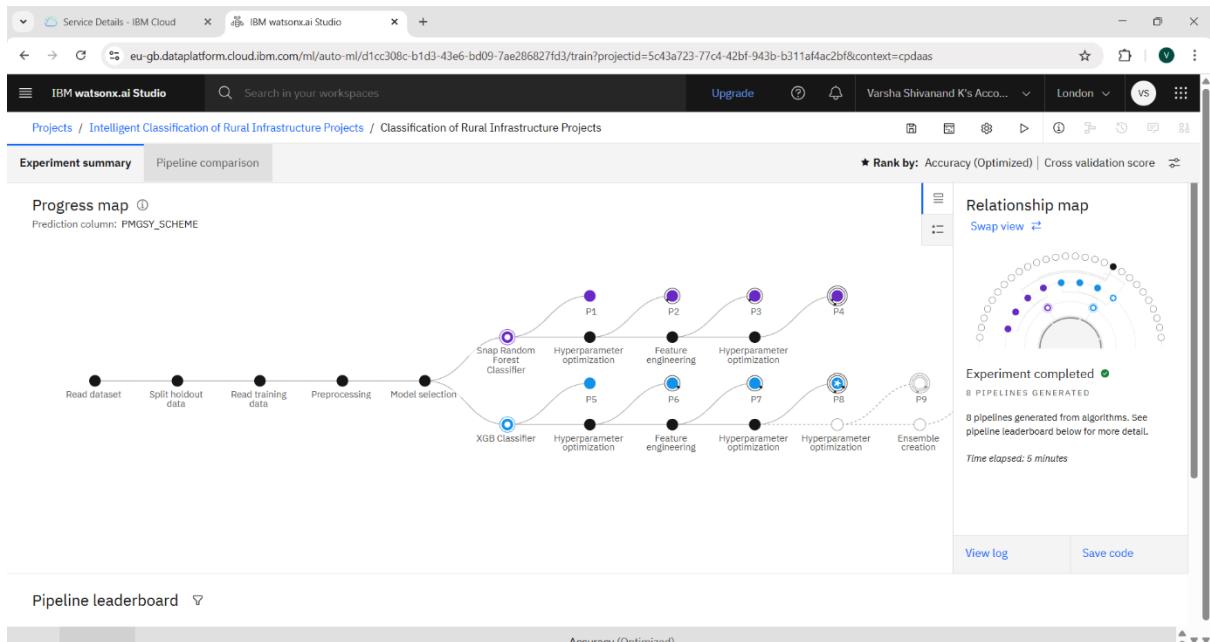


Step 23 : Now click on swap view

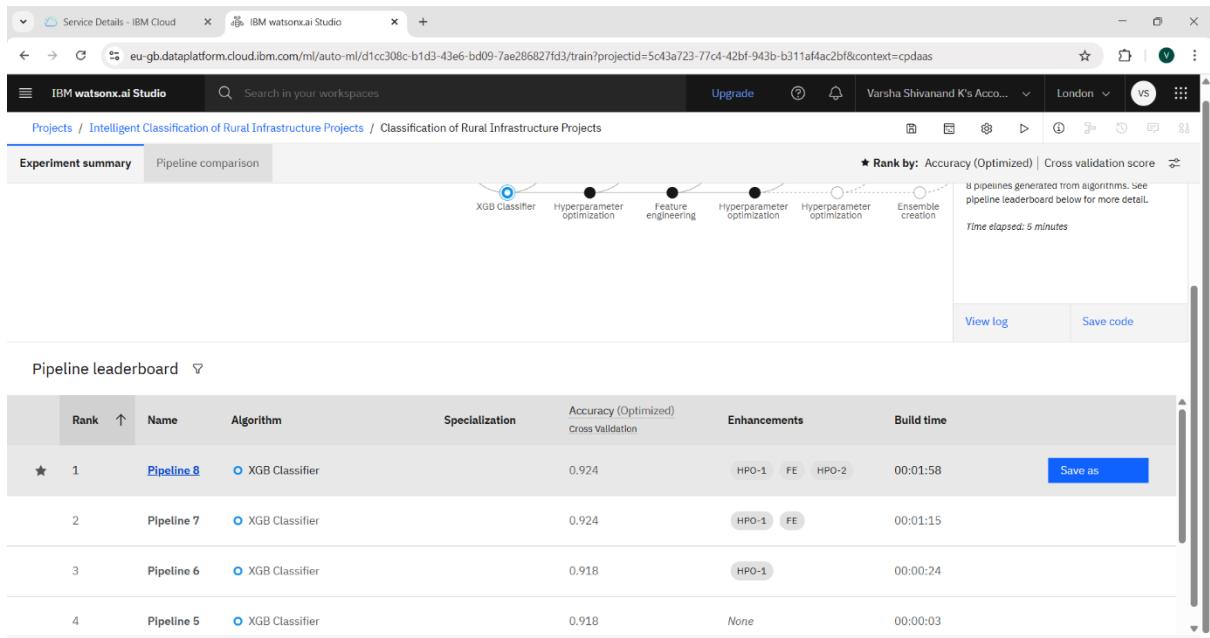


Step 24 : Pipelines are building





Step 25 : This is the pipeline leaderboard. In this pipeline 8 is the top performer.



Pipeline leaderboard

Rank	Name	Algorithm	Specialization	Accuracy (Optimized) Cross Validation	Enhancements	Build time
5	Pipeline 4	Snap Random Forest Classifier		0.899	HPO-1 FE HPO-2	00:00:36
6	Pipeline 3	Snap Random Forest Classifier		0.899	HPO-1 FE	00:00:28
7	Pipeline 2	Snap Random Forest Classifier		0.897	HPO-1	00:00:07
8	Pipeline 1	Snap Random Forest Classifier		0.897	None	00:00:02

Step 26 : Now we can save pipeline 8 model. Click on save as, choose model asset and click on create.

Save as

Select asset type

Model

Create a watsonx.ai Runtime model asset that you can test with new data, deploy to generate predictions, and trace lineage activity.

Notebook

Create a notebook if you want to view the code that created this model pipeline or interact with the model programmatically.

Define details

Name: P8 - XGB Classifier: Classification of Rural Infrastructure Projects

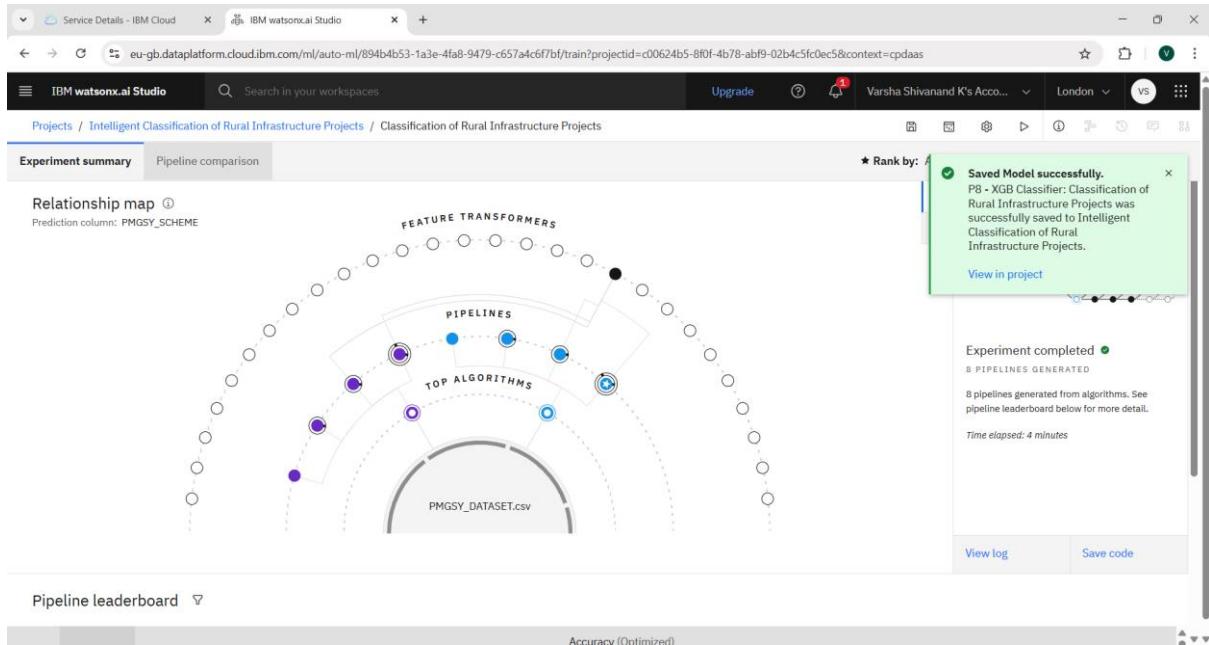
Description (optional): Model description

Tags: Add tags to make assets easier to find.

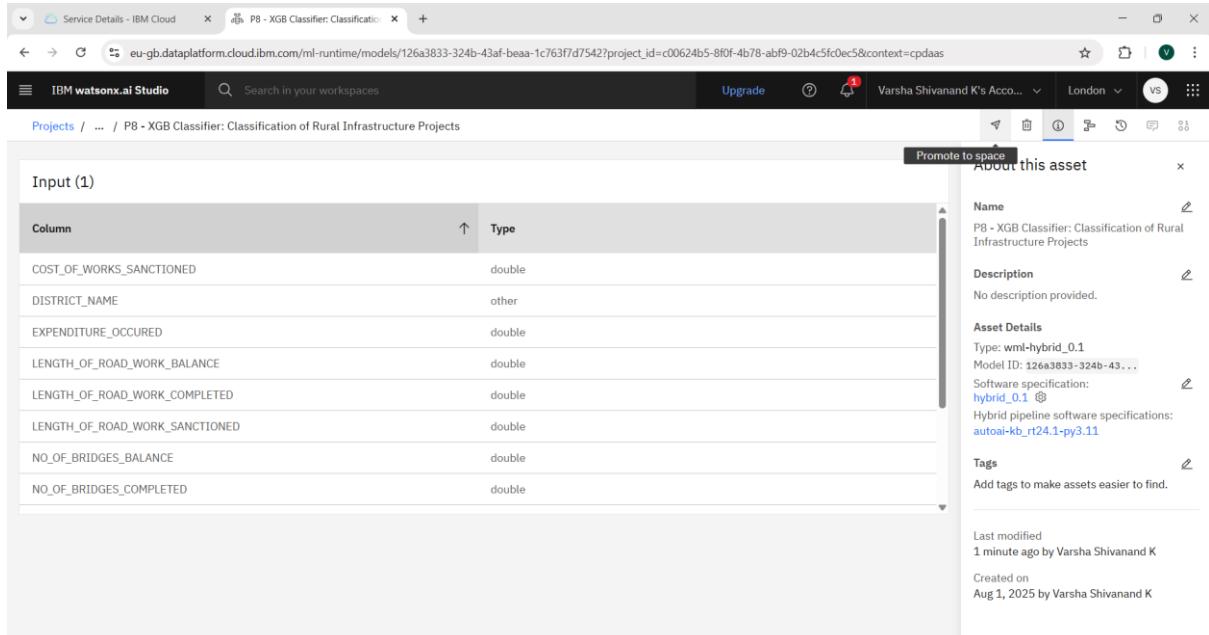
Add a tag

Cancel Create

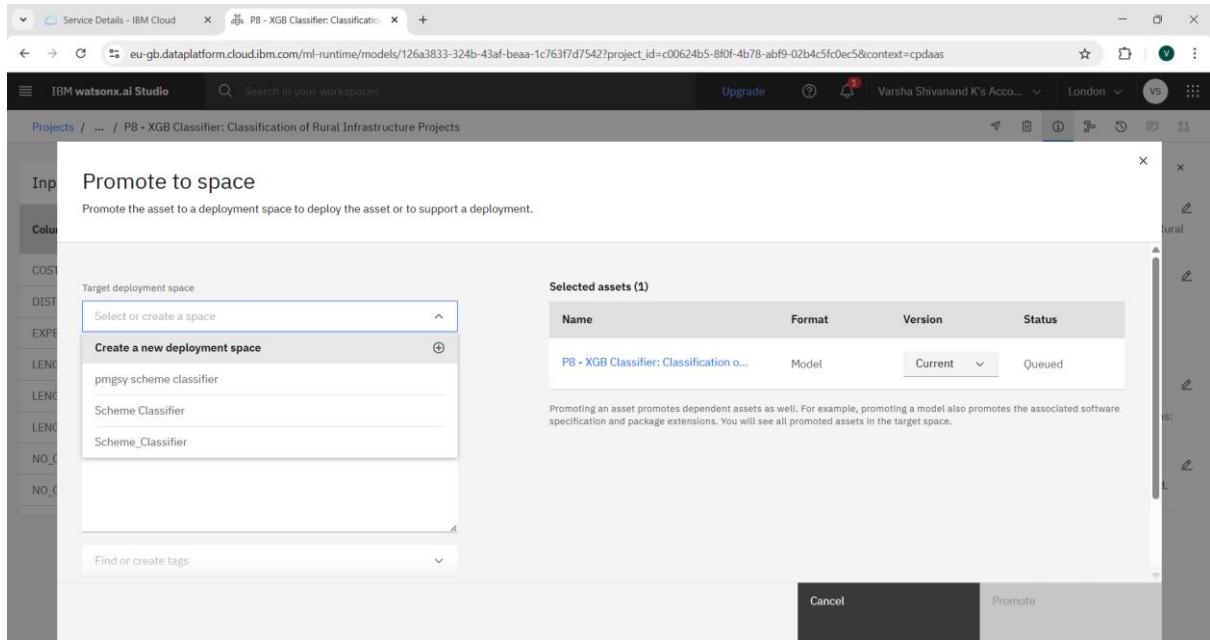
Step 27 : The model is saved successfully, now click on View in project



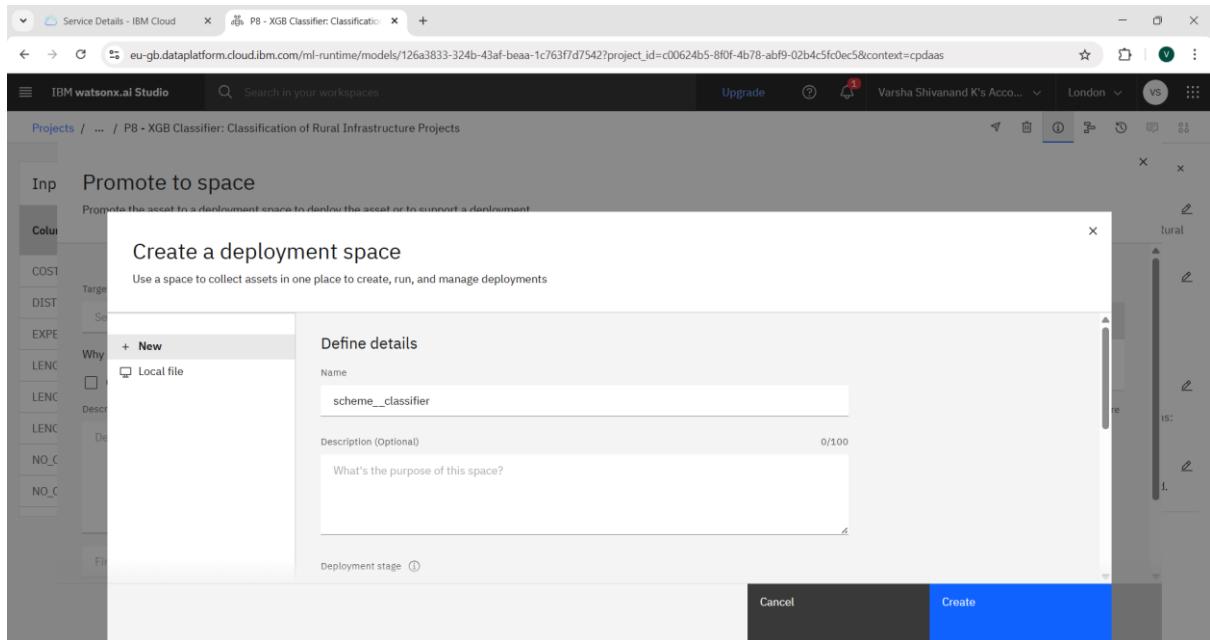
Step 28 : Click on promote to space arrow.

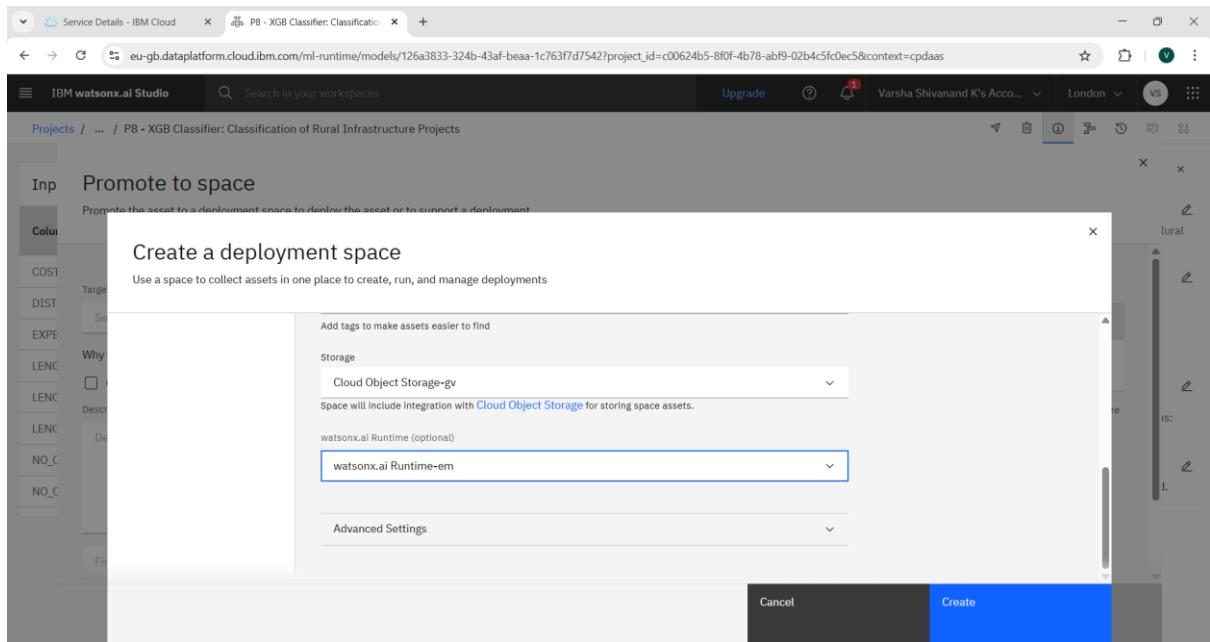


Step 29 : Create a new deployment space.

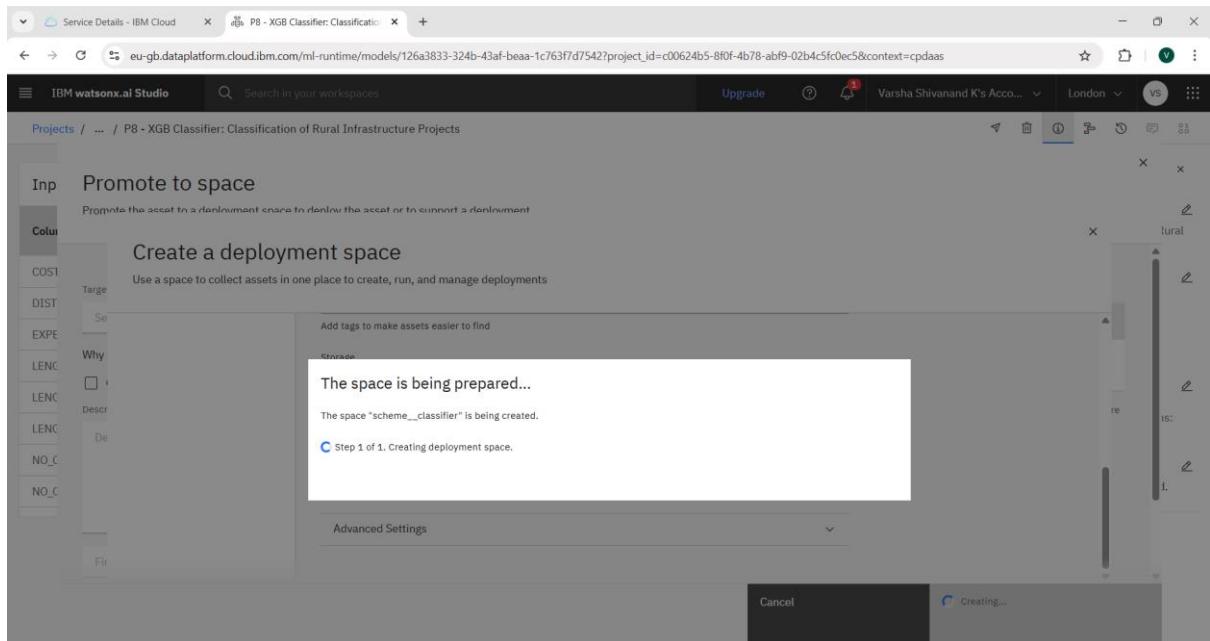


Step 30 : Give deployment space name and select watsonx.ai Runtime service, click on create.

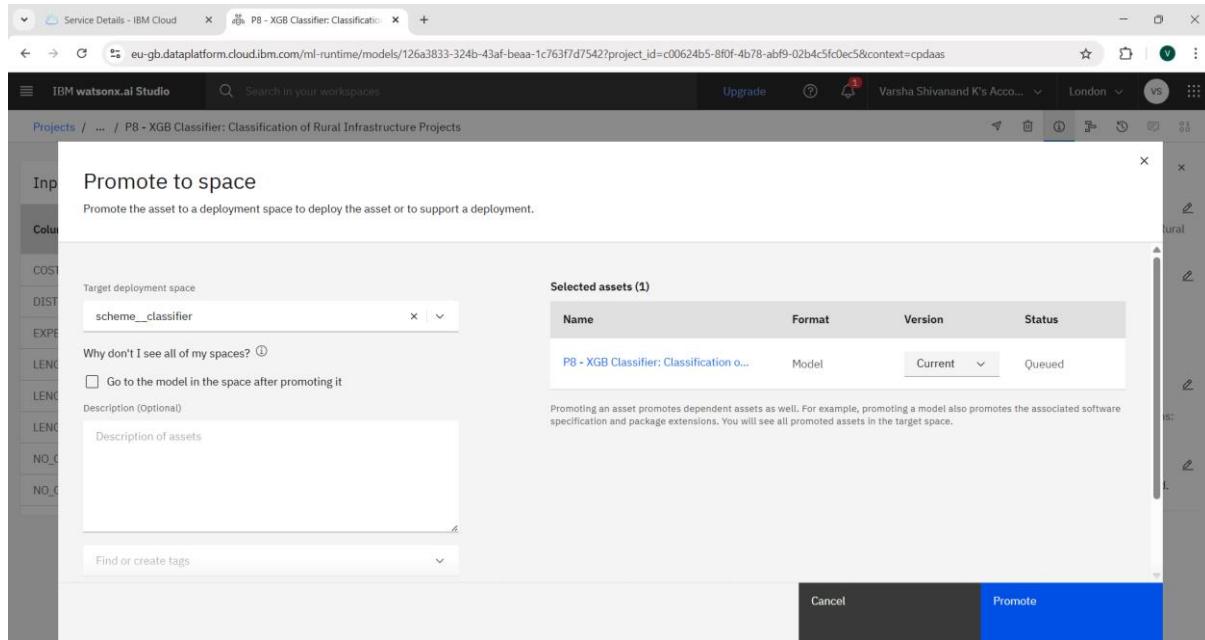




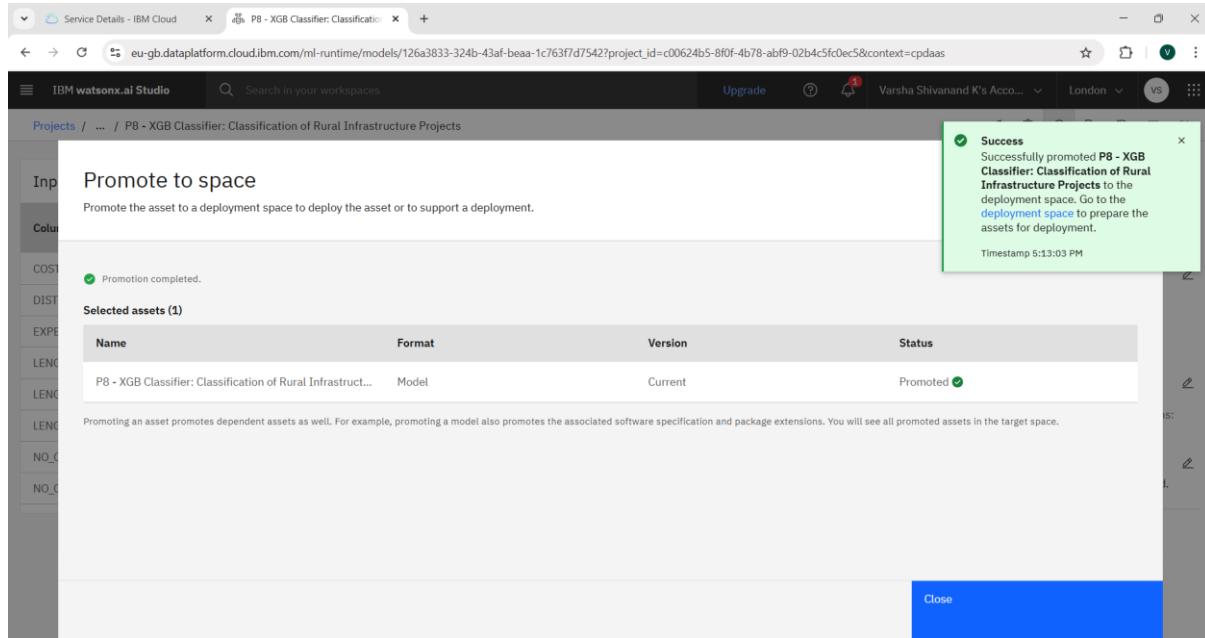
Step 31 : The deployment space is being prepared.



Step 32 : Click on Promote.



Step 33 : It is promoted. Now click on deployment space.



Step 34 : Click on the asset name.

The screenshot shows the 'Assets' tab of the IBM Watsonx.ai Studio interface. A single asset is listed under 'All assets'. The asset details are as follows:

Name	Last modified
P8 - XGB Classifier: Classification of Rural Infrastructure Projects Machine learning model from AutoAI	2 minutes ago Varsha Shivanand K (You)

Below the table, there is a message: "This asset doesn't have any deployments yet. Use the New Deployment button to create a deployment for this asset." The URL in the browser bar is https://eu-gb.dataplatform.cloud.ibm.com/ml-runtime/models/9c649098-1cc0-4ba6-a5b3-0e2db3254cf3?space_id=c67f2fe7-1cf3-43ab-b30d-8e52e3c14ecf&context=cpdaas.

Step 35 : Click on New Deployment

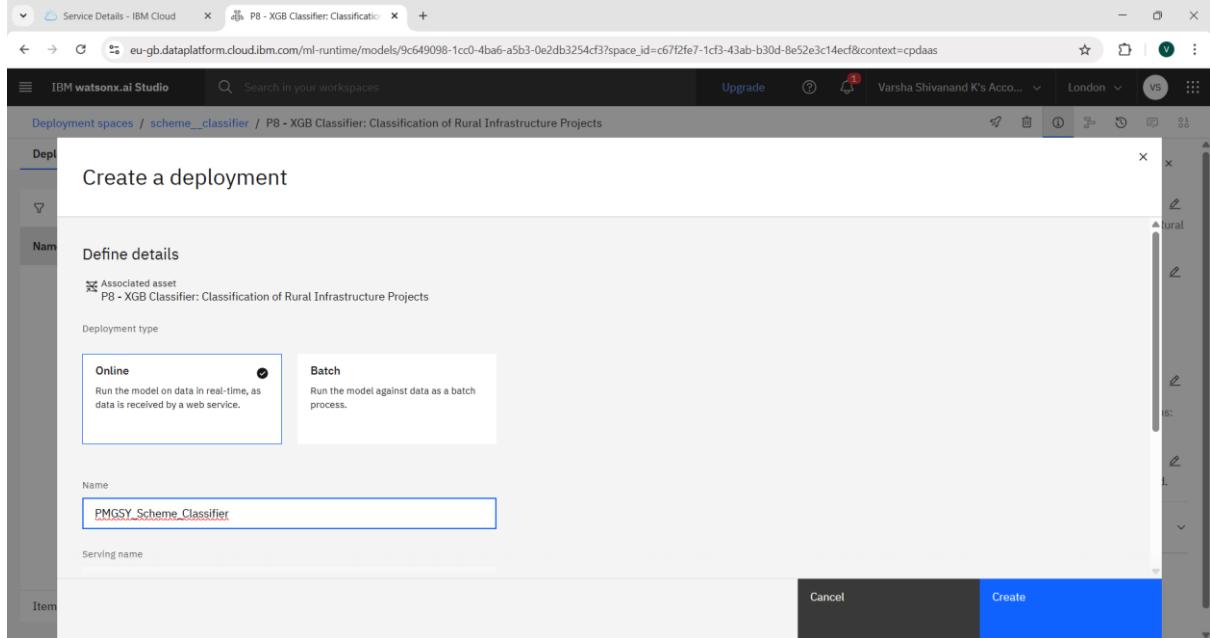
The screenshot shows the 'Deployments' tab of the IBM Watsonx.ai Studio interface for the asset 'P8 - XGB Classifier: Classification of Rural Infrastructure Projects'. The 'About this asset' panel on the right provides basic information:

- Name:** P8 - XGB Classifier: Classification of Rural Infrastructure Projects
- Description:** No description provided.
- Asset Details:** Type: wml-hybrid_0.1, Model ID: 9c649098-1cc0-4ba6-a5b3-0e2db3254cf3, Software specification: hybrid_0.1, Hybrid pipeline software specifications: autoai-kb_r24.1-p3.11
- Tags:** Add tags to make assets easier to find.
- Source asset details:** Last modified 3 minutes ago by Varsha Shivanand K, Created on Aug 1, 2025 by Varsha Shivanand K

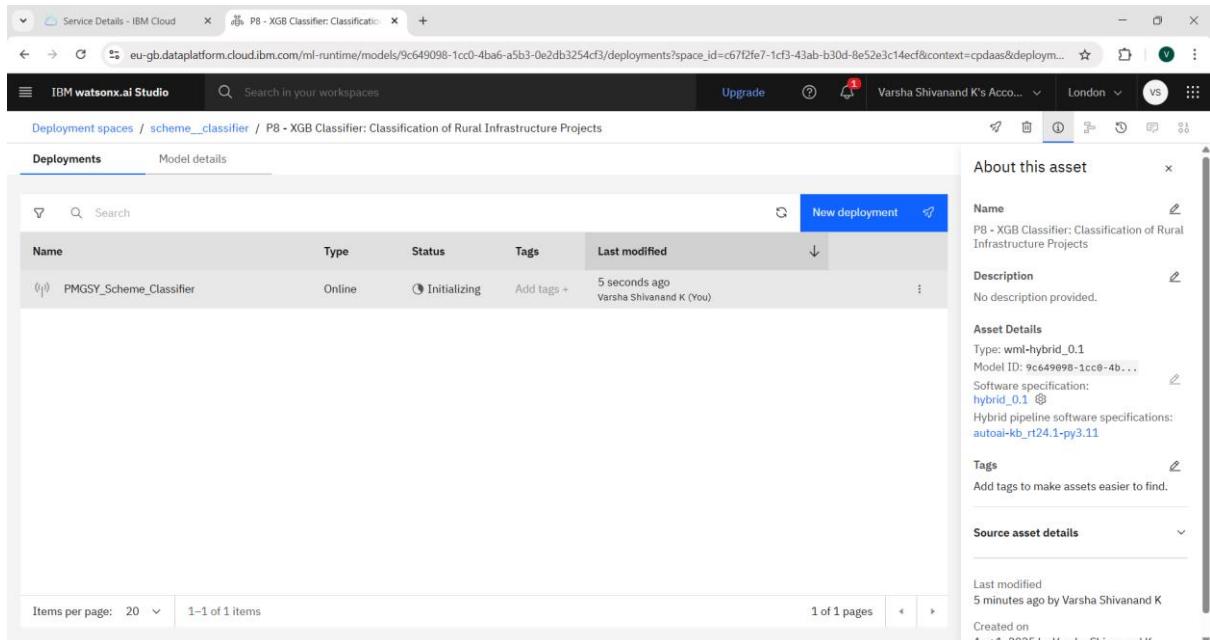
The main table shows no items:

Name	Type	Status	Tags	Last modified
Items per page: 20 0–0 of 0 items				

Step 36 : Select the Deployment Type as Online, give Deployment name and click on Create



Step 37 : Now the model is deployed. Click on it.



Step 38 : Click on Test to predict/classify new values.

Service Details - IBM Cloud

PMGSY_Scheme_Classifier

IBM watsonx.ai Studio

API reference Test

Endpoints for scoring

Private endpoint: https://private.eu-gb.ml.cloud.ibm.com/v4/deployments/1b41cffb-a55c-4d9b-a3bb-88df3ab87a78/predictions?version=2021-05-01

Public endpoint: https://eu-gb.ml.cloud.ibm.com/ml/v4/deployments/1b41cffb-a55c-4d9b-a3bb-88df3ab87a78/predictions?version=2021-05-01

Code snippets

cURL Java JavaScript Python Scala

```
# NOTE: you must set $API_KEY below using information retrieved from your IBM Cloud account (https://eu-gb.dataplatform.cloud.ibm.com/docs/)
export API_KEY=your API key
export IAM_TOKEN=$(curl --insecure -X POST --location "https://iam.cloud.ibm.com/identity/token" \
--header "Content-Type: application/x-www-form-urlencoded" \
--data "grant_type=client_credentials&scope=iam openid">>>
```

About this deployment

Name: PMGSY_Scheme_Classifier

Description: No description provided.

Deployment Details

Deployment ID: 1b41cffb-a55c-4d9b-a3bb-88df3ab87a78

Serving name: No serving name.

Software specification: hybrid_0.1

Hybrid pipeline software specifications: autoai-kb_r24.1-py3.11

Copies: 1

Tags: Add tags to make assets easier to find.

Associated asset: P8 - XGB Classifier: Classification of Rural Infrastructure Projects

Service Details - IBM Cloud

PMGSY_Scheme_Classifier

IBM watsonx.ai Studio

API reference Test

Enter input data

Text 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 ×

	STATE_NAME (other)	DISTRICT_NAME (other)	NO_OF_ROAD_WORK_SANCTIONED (double)	LENGTH_OF_ROAD_WORK_SANCTIONED (double)	NO_OF_BRIDGES_SANCTIONED (double)
1	1				
2					
3					
4					

0 rows, 13 columns

Predict

Step 39 : Enter the new values for 1st input.

PMGSY_Scheme_Classifier Deployed Online

API reference Test

Enter input data

Text JSON

Download CSV template ↴ Browse local files ↗ Search in space ↗ Clear all ×

	STATE_NAME (other)	DISTRICT_NAME (other)	NO_OF_ROAD_WORK_SANCTIONED (double)	LENGTH_OF_ROAD_WORK_SANCTIONED (double)	NO_OF_BRIDGES_SANCTIONED (double)
1	Andaman And Nicoba	North and Middle Andam	32	60.169	0
2					
3					
4					
5					

1 row, 13 columns

Predict

Similarly enter input values for all 10 records and click on Predict.

Step 40 : Now you can see the prediction/classification results -

The PMGSY Scheme label name and confidence scores.

PMGSY_Scheme_Classifier Deployed Online

API reference Test

Prediction results

Prediction type: Multiclass classification

Prediction percentage: 10 records

Display format for prediction results: Table view (selected) JSON view

	Prediction	Confidence
1	PMGSY-I	96%
2	PMGSY-III	99%
3	PMGSY-II	97%
4	PMGSY-II	99%
5	PMGSY-III	100%
6	PM-JANMAN	97%
7	RCPLWEA	97%
8	RCPLWEA	96%
9	PM-JANMAN	99%
10	PMGSY-III	99%

Show input data

Download JSON file

Here, you can take screenshot of the output, or download the output as a JSON File by clicking on “Download JSON file” button.