

Lab-1: Setup Environment

Introduction

This lab will set up the Watson Studio environment for subsequent labs and introduce you to the Project and Community features of Watson Studio. Watson Studio is an integrated platform of tools, services, data, and meta-data to help companies and agencies accelerate their shift to be data driven organizations. The platform enables data professionals such as data scientists, data engineers, business analysts, and application developers collaboratively work with data to build, train, deploy machine learning and deep learning models at scale to infuse AI into business to drive innovation. Watson Studio is designed to support the development and deployment of data and analytics assets for the enterprise.

End-to-End Data Science

The general flow of the End to End Data Science PoT will be guided by the activities shown in Figure 1- End to End Flow. This lab will focus on the Create Project and Research Topics activities.

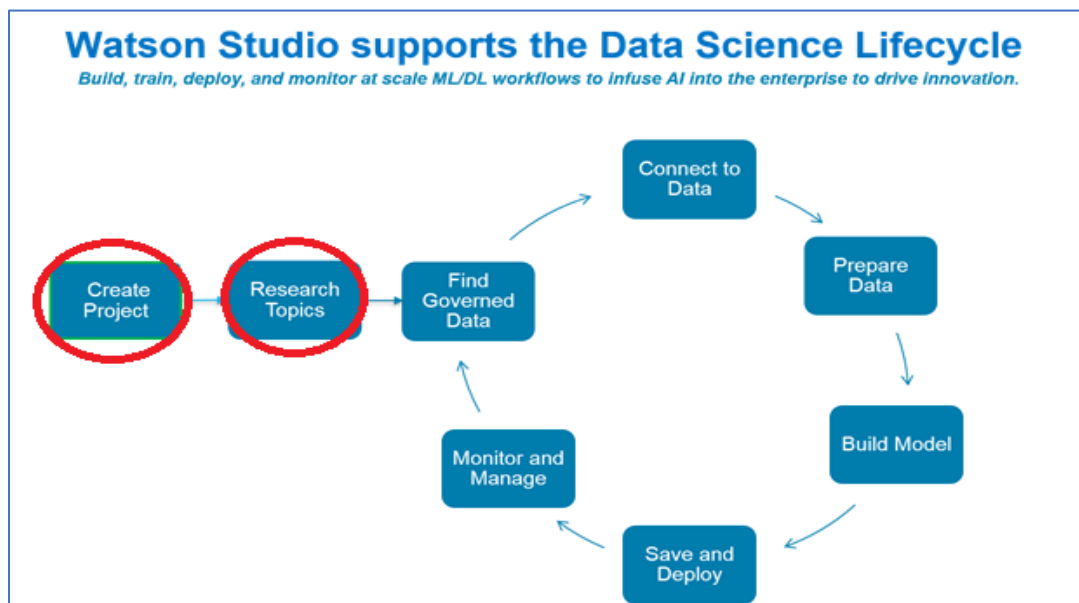


Figure 1- End to End Flow

Objectives

The goal of this lab is to familiarize the user with the Project and Community features of Watson Studio, and to set up the environment for subsequent labs. Projects are a core component of Watson Studio. Projects enable you to organize your analytic and data assets in one place. Projects are also the home base for collaboration. Colleagues can be added as collaborators on a project with administrator, editor, or viewer access.

The Community feature of Watson Studio provides built-in learning. Articles, Notebooks, Tutorials, Datasets, and Papers are curated from well-known sources and provided as

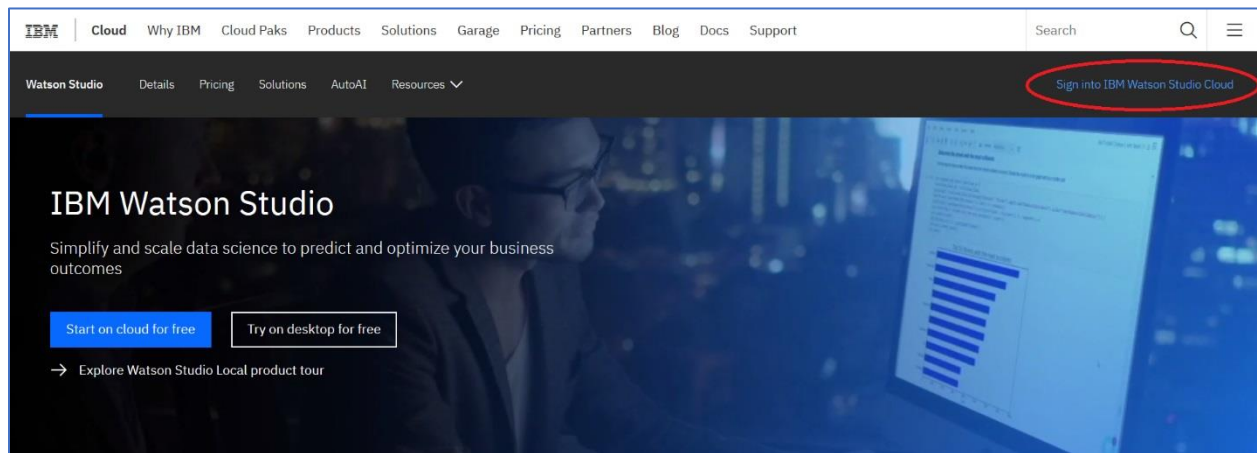
“Community Cards”. These artifacts can be bookmarked in Projects for easy reference. The Community feature supports the “Research Topics” activity in the end-to-end process shown above.

After completing this lab, you will be familiar with these features of Watson Studio.

1. Create a project
2. Create an object storage instance and associate it with the project
3. Associate an existing Watson Machine Learning service instance with the project
4. Add a collaborator to the project
5. Research topics by searching the Community

Create a Project

1. Log into your Watson Studio account by typing in the url **datascience.ibm.com** in your Firefox or Chrome browser.
2. Click on **Sign into Watson Studio Cloud** (not Cloud sign-up/log-in)



3. Enter your Watson Studio user id and click **Continue**.

Log in to IBM

IBMid

[Forgot IBMid?](#)

wsuser30000@gmail.com

☐ Remember me [i](#)

Continue

Don't have an account? [Create an IBMid](#)

Need help? [Contact the IBMid help desk](#)

4. Enter your **Password** and click **Log in**.

Log in to IBM

Logging in as wsuser30000@gmail.com [Not you?](#)

Password

[Forgot password?](#)

••••••••



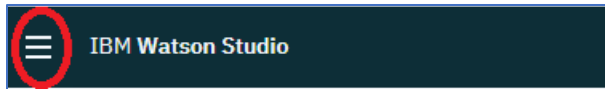
☐ Remember me [i](#)

Log in

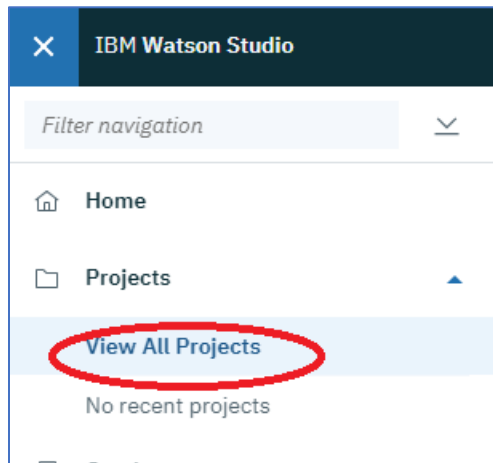
Don't have an account? [Create an IBMid](#)

Need help? [Contact the IBMid help desk](#)

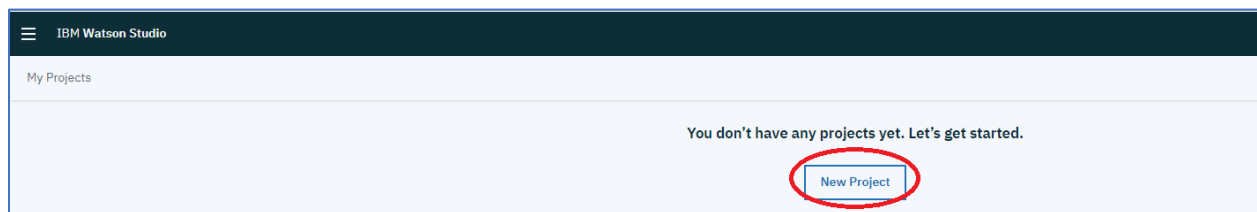
5. Click on the hamburger icon .



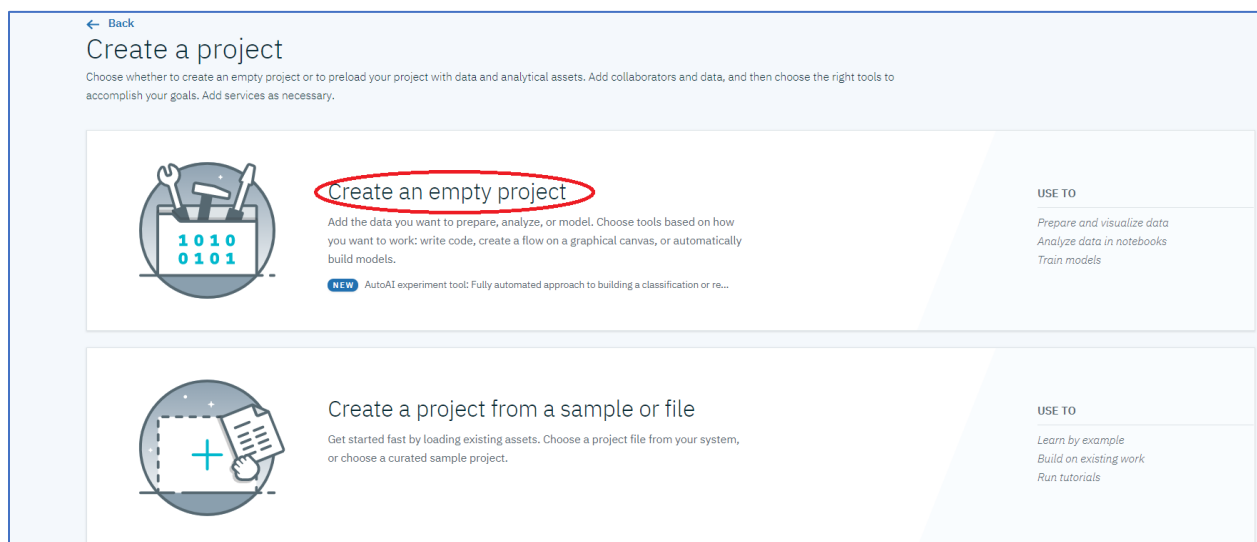
6. Click on **View All Projects**



7. Click on **New Project**.



8. Click on Create an empty project.



9. Enter “Watson Studio Labs” for the **Name**, optionally enter a **Description**, check **Restrict who can be a collaborator** (if it’s unchecked), and in **Define Storage** click on **Add** to add an object storage instance.

New project

Define project details

Name

Watson Studio Labs

Description

Project description

Choose project options

☒ Restrict who can be a collaborator

Project will include integration with Cloud Object Storage for storing project assets.

Define storage

1 Select storage service

Add

Add an object storage instance and then return to this page and click Refresh.

2 Refresh

Cancel Create

10. Click on **Lite**, and then click on **Create**

Cloud Object Storage

IBM Cloud Object Storage is a highly scalable cloud storage service, designed for high durability, resiliency and security. Store, manage and access your data via our self-service portal and RESTful APIs. Connect applications directly to Cloud Object Storage use other IBM Cloud Services with your data.

Features

Storage for the IBM Cloud

IBM Cloud Object Storage provides unstructured data storage for cloud applications. Libraries and SDKs support a common set of S3 API functions for connecting new applications to scalable cloud storage and integrating your data into other services on the IBM Watson and Cloud Platform available with Regional and Cross Region resiliency options worldwide.

Built-in Aspera high-speed transfer

With IBM Cloud Object Storage Aspera high-speed data transfer, you can improve data transfer performance by quickly transferring data over long distances, and under various network conditions. It's natively integrated into Cloud Object Storage and there is no additional cost for uploading data.

Storage Classes and Archive Policy

Choose storage classes based on your usage patterns for active, less active, and cold workloads with Standard, Vault, and Cold Vault respectively. Use Flex class for dynamic data access with usage patterns that are hard to predict. For rarely used data that requires long-term retention, simply set an Archive policy with our existing storage class tiers allowing you to reduce costs even further with our lowest priced Archive storage.

Access and Key Management

IBM Identity and Access Management (IAM) policies allow for granular access control at the bucket level using role-based policies. IBM Protect support allows customers to have their own managed encryption keys for higher level data security.

Pricing Plan: Monthly Process shown above reflect the: United States

PLAN	FEATURES	PRICING
<input checked="" type="radio"/> Lite	<p>1 COS Service Instance</p> <p>Storage up to 25 GB/mo.</p> <p>Up to 20,000 GET requests/mo.</p> <p>Up to 2,000 PUT requests/mo.</p> <p>Up to Data Retrieval 10 GB/mo.</p> <p>Up to 5GB Public Outbound</p> <p>Applies to aggregate total across all storage bucket classes</p>	Free
<input type="radio"/> Standard	<p>There is no minimum fee, so you pay only for what you use.</p>	Expand each section to view details

The Lite service plan for Cloud Object Storage includes Regional and Cross Regional resiliency, flexible data classes, and built in security.

Cancel Create

11. Click **Confirm**.

×

Confirm Creation

Plan

Lite

Resource group

Default

Service name

cloud-object-storage-uu

Cancel

Confirm

12. Click **Refresh**.

New project

Define project details

Name

Watson Studio Labs

Description

Project description

Choose project options

☒ Restrict who can be a collaborator ⓘ

Project will include integration with Cloud Object Storage for storing project assets.

Define storage

① Select storage service

Add

Add an object storage instance and then return to this page and click Refresh.

Refresh

13. Click **Create**.

New project

Define project details

Name

Watson Studio Labs

Description

Project description

Choose project options

☒ Restrict who can be a collaborator ⓘ

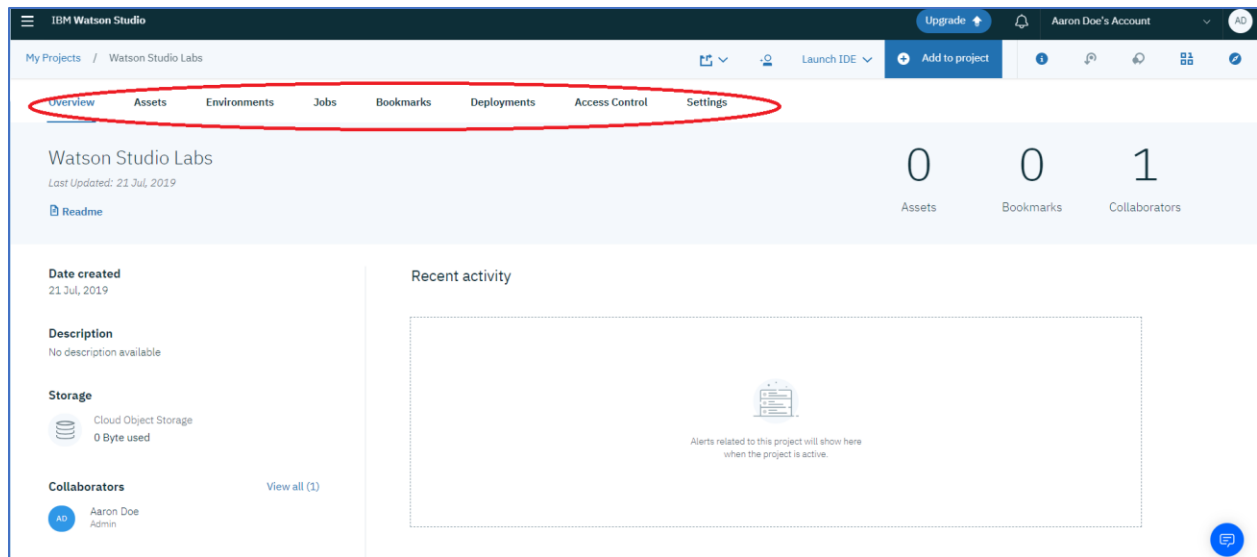
Project will include integration with Cloud Object Storage for storing project assets.

Storage

cloud-object-storage-uu

Cancel Create

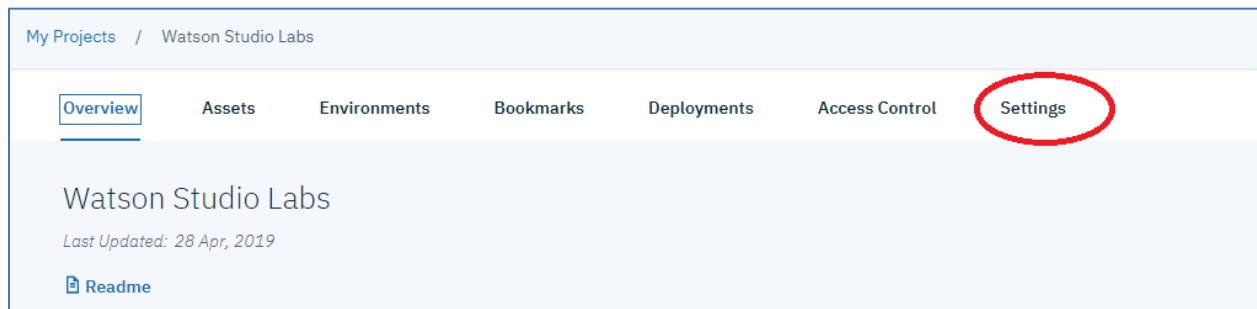
14. The Project **Overview** page is shown. This page provides summarized information about the project. In addition to the Overview page, are seven other pages described below.
- a. **Assets Page** – Analytics and Data assets can be added to the project from this page.
 - b. **Environments Page** - Provides information on the current notebook environments that are defined, lists the active notebook environments currently running, and enables users to create custom notebook environments.
 - c. **Jobs Page** – Provides the interface to the job subsystem. This replaces the separate UIs to set up and run jobs for Notebooks and the Data Refinery. This is a new feature in Watson Studio Cloud version.
 - d. **Bookmarks Page** - Lists artifacts from the Community that are bookmarked in this project.
 - e. **Deployments Page** – Lists the deployed models
 - f. **Access Control** – Lists the project collaborators and enables users to add/remove collaborators.
 - g. **Settings** – Enables users to view and set project attributes.



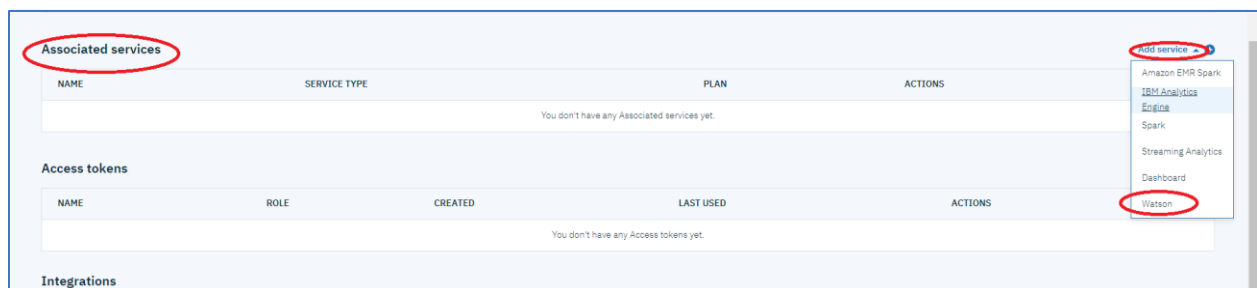
Associate a Watson Machine Learning Service to the Project

To save and deploy machine learning models, a Watson Machine Learning service must be created (if one doesn't exist) and added to our project.

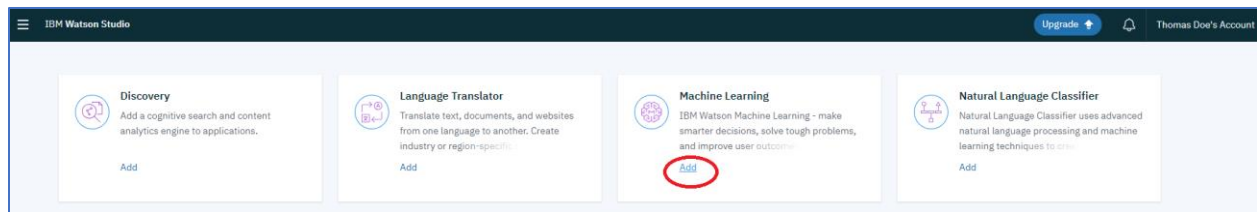
1. Click on **Settings** to navigate to the Project **Settings** page.



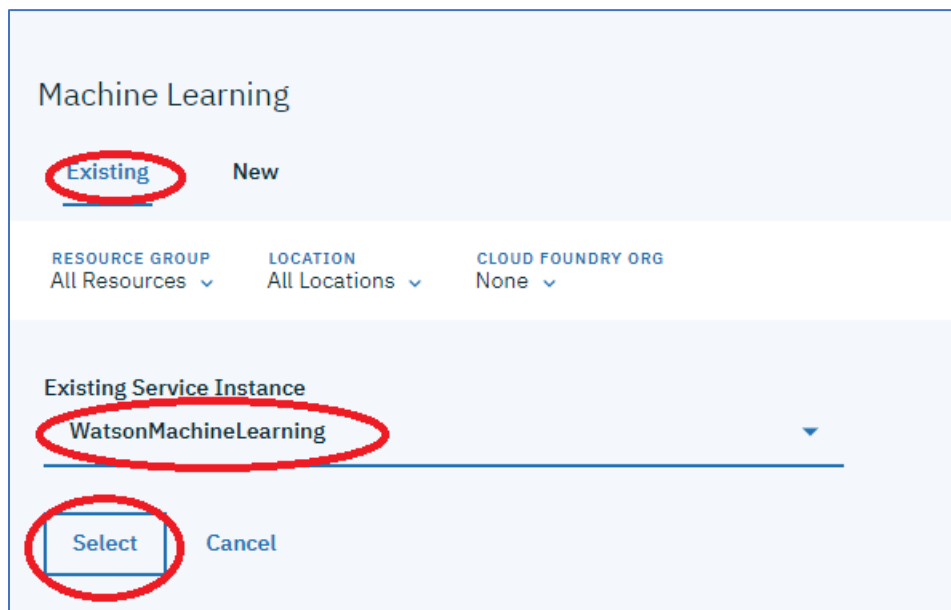
2. Scroll down to **Associated Services**, click on **Add service**, click on **Watson**.



3. Click on **Add** in the **Machine Learning** tile.



4. Newer Watson Studio accounts come with the WatsonMachineLearning instance already created. Select **Existing**, select **WatsonMachineLearning** for the **Existing Service Instance**, and click on **Select**. If you don't have an existing service, click on New and follow the instructions to create a Lite Watson Machine Learning service.



5. The **WatsonMachineLearning** service is associated with the project.

Associated services				Add service +	
NAME	SERVICE TYPE	PLAN	ACTIONS		
WatsonMachineLearning	Watson - Machine Learning				


Add a Project Collaborator

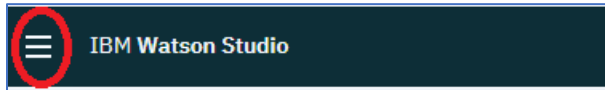
Colleagues can gain access to a project's data and analytic assets by being made a collaborator. Permissions are based on the assigned role. The roles are administrator, editor, and viewer.

Recall, the project that was created in this lab restricts who can collaborate. This option was required to demonstrate the Watson Knowledge catalog features in lab-2. The restriction limits the collaborators to be members of your company (if your company has federated SAML with IBM Cloud), or a member of the project creator's IBM Cloud account. Given the restriction, to demonstrate adding collaborators to the project, we will need to first add the collaborator to your IBM Cloud account.

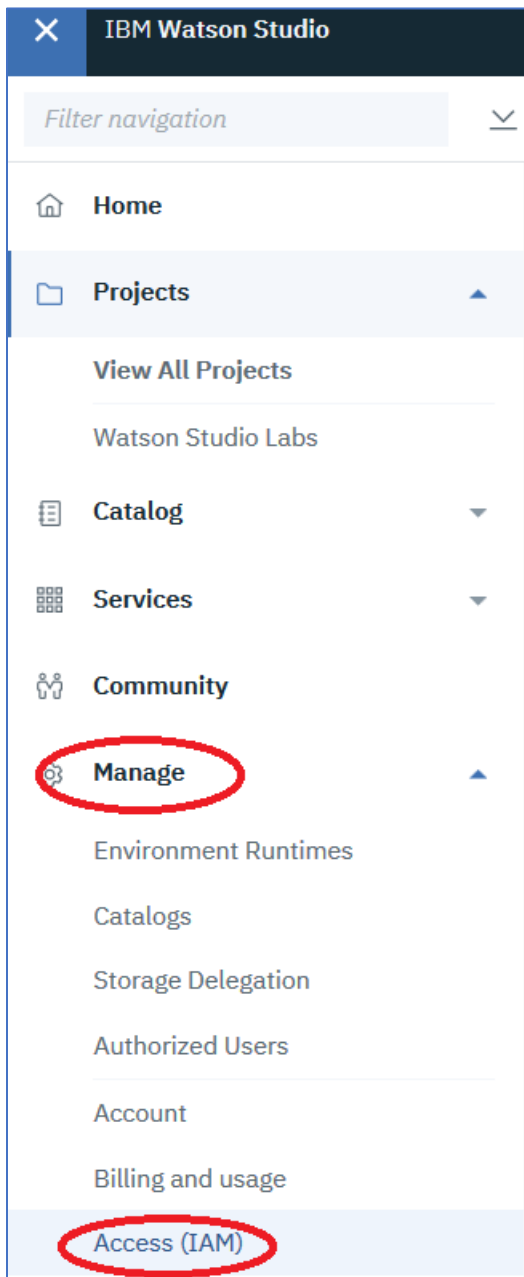
We will add two collaborators. One to demonstrate project collaboration, the second to demonstrate catalog collaboration.

Step 1 – Add Collaborator to the IBM Account

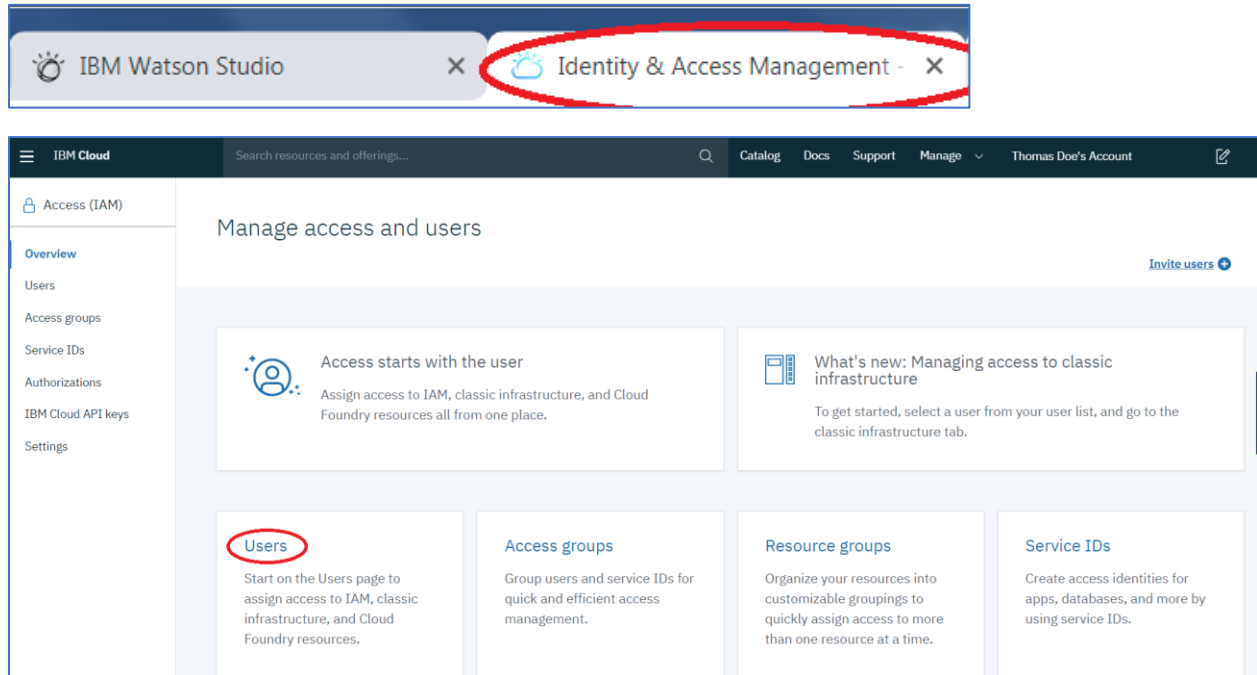
1. Click on the hamburger  icon



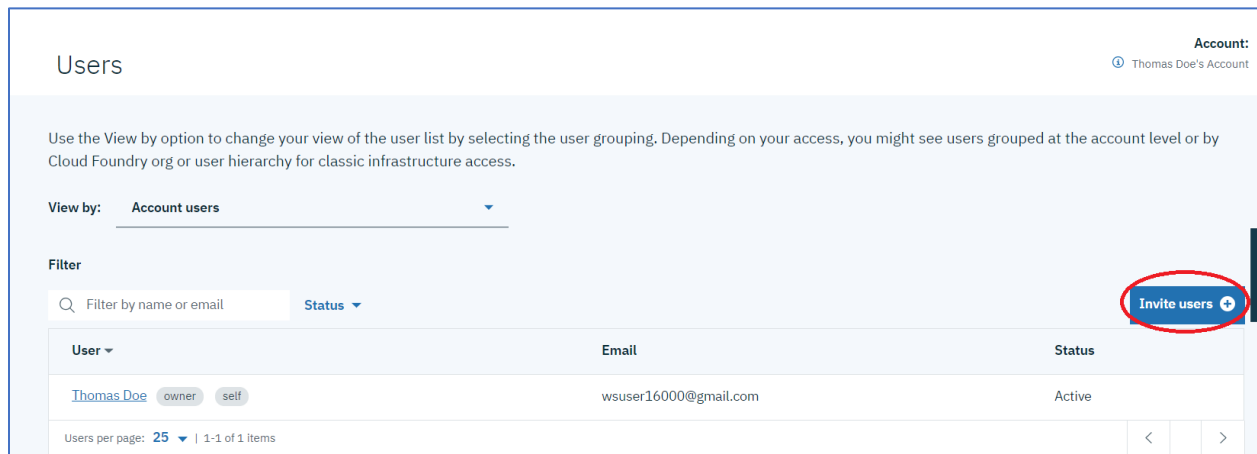
2. Click on **Manage** and then click on **Access (IAM)**



3. An **Identity and Access Management (IAM)** browser tab is created providing the IBM Cloud user interface to the IAM subsystem. Click on **Users**.



4. Click on **Invite Users**.



5. For **E-mail address**, enter the **PROJECT COLLABORATOR** e-mail address on the index card handed out, for **Service** select **All Identity and Access enabled services**.

Invite users

Users

You can invite one or more users. All users invited together are granted the same access.

Email address

beekmanb@us.ibm.com

Access

Assign access for all invited users. The default is no access, but at least one type of access must be assigned.

Services ⓘ

An initial IAM policy can be assigned with this invite. You can edit this policy or assign additional access after the user accepts the invite. All fields are required.

Assign access to ⓘ

Resource

Services

All Identity and Access enabled services

This option automatically grants access to new services when added.

6. Scroll down. For **Platform access roles**, click on **Viewer**. For **Service access roles**, click on **Reader**, and then click on **Invite users**.

Access (IAM)

Overview

Users

Access groups

Service IDs

Authorizations

IBM Cloud API keys

Settings

Completed and doesn't limit the actions of the lesser roles. These roles enable actions to be performed on platform resources, such as creating instance, connecting instance to apps, and assigning user access.

Assign platform access roles

☐ **Administrator**
As an administrator, you can perform all platform actions based on the resource this role is being assigned, including assigning access policies to other users.

☐ **Editor**
As an editor, you can perform all platform actions except for managing the account and assigning access policies.

☐ **Operator**
As an operator, you can perform platform actions required to configure and operate service instances, such as viewing a service's dashboard.

☒ **Viewer**
As a viewer, you can view service instances, but you can't modify them.

Each role is customized by the selected service. Refer to the service's documentation for more details.

Assign service access roles

☐ **Manager**
As a manager, you have permissions beyond the writer role to complete privileged actions as defined by the service. In addition, you can create and edit service-specific resources.

☐ **Writer**
As a writer, you have permissions beyond the reader role, including creating and editing service-specific resources.

☒ **Reader**
As a reader, you can perform read-only actions within a service such as viewing service-specific resources.

> Cloud Foundry access ⓘ

Cancel Invite users

7. Repeat steps 4,5,6 for the **CATALOG COLLABORATOR** on the index card handed out. Click on **Invite Users**.

Users

Account: Peter Doe's Account

Use the View by option to change your view of the user list by selecting the user grouping. Depending on your access, you might see users grouped at the account level or by Cloud Foundry org or user hierarchy for classic infrastructure access.

View by: Account users

Filter

Filter by name or email Status

User	Email	Status
Bernard Beekman	beekmanb@us.ibm.com	Active
Peter Doe owner self	wsuser21000@gmail.com	Active

Users per page: 25 | 1-2 of 2 Items

Invite users

- For **E-mail address**, enter the **CATALOG COLLABORATOR** e-mail address on the index card handed out, for **Service** select **All Identity and Access enabled services**.

Users

You can invite one or more users. All users invited together are granted the same access.

Email address

wsuserblb@gmail.com

Access

Assign access for all invited users. The default is no access, but at least one type of access must be assigned.

Services

The role field is required.

An initial IAM policy can be assigned with this invite. You can edit this policy or assign additional access after the user accepts the invite. All fields are required.

Assign access to

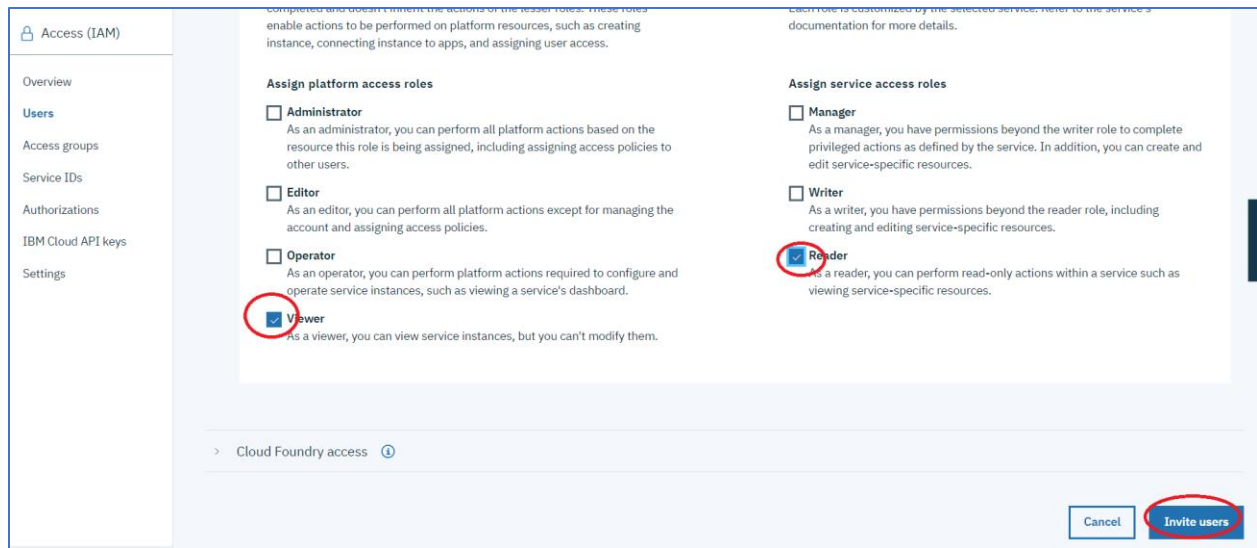
Resource

Services

All Identity and Access enabled services

This option automatically grants access to new services when added.

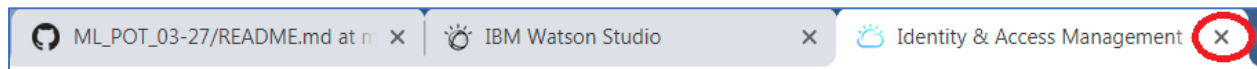
- Scroll down. For **Platform access roles**, click on **Viewer**. For **Service access roles**, click on **Reader**, and then click on **Invite users**.



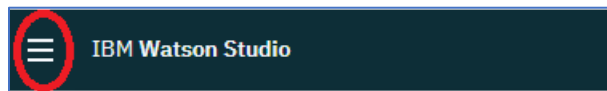
Step 2 – Add Collaborator to the Project

Now that the collaborator has been added to the IBM Cloud Account, you can add the collaborator to the project.

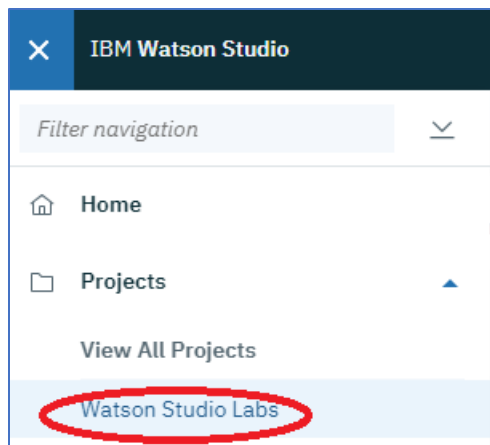
1. Close the Identity and Access Management tab.



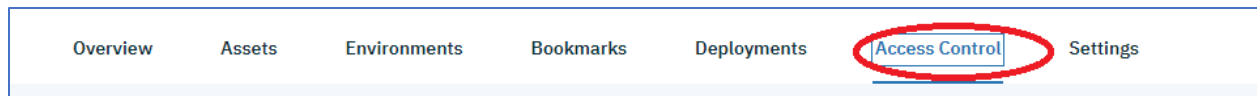
2. Click on the **IBM Watson Studio** tab. Click on the ☰ icon.



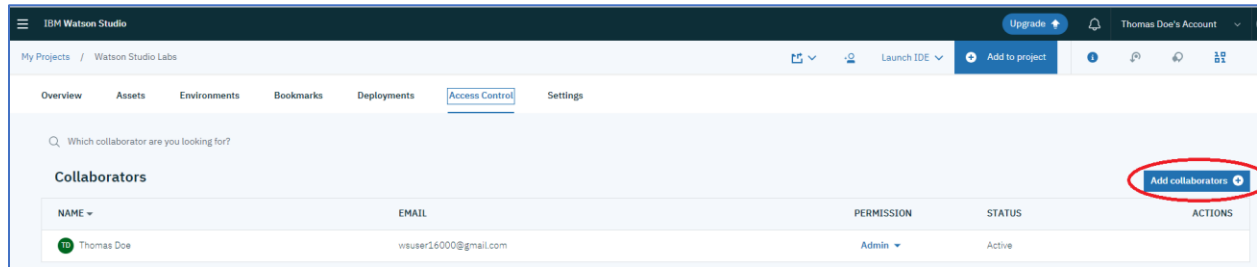
3. Click on Watson Studio Labs.



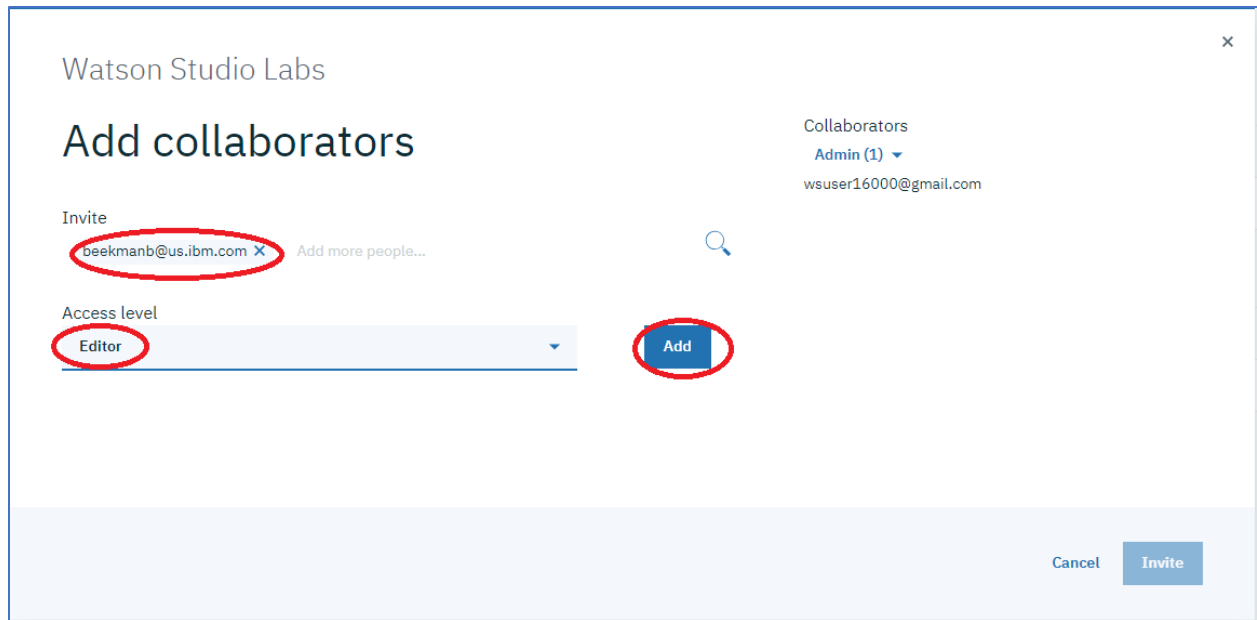
4. Click on the **Access Control** tab.



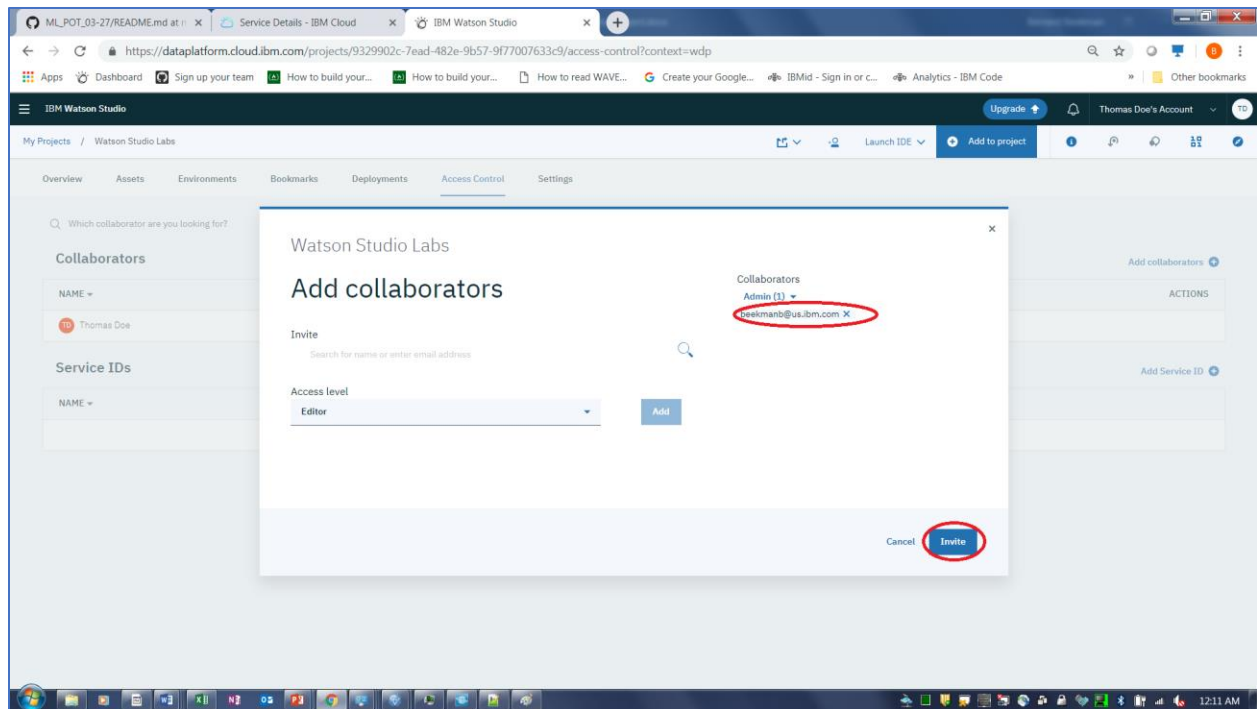
5. Click on **Add collaborators**.



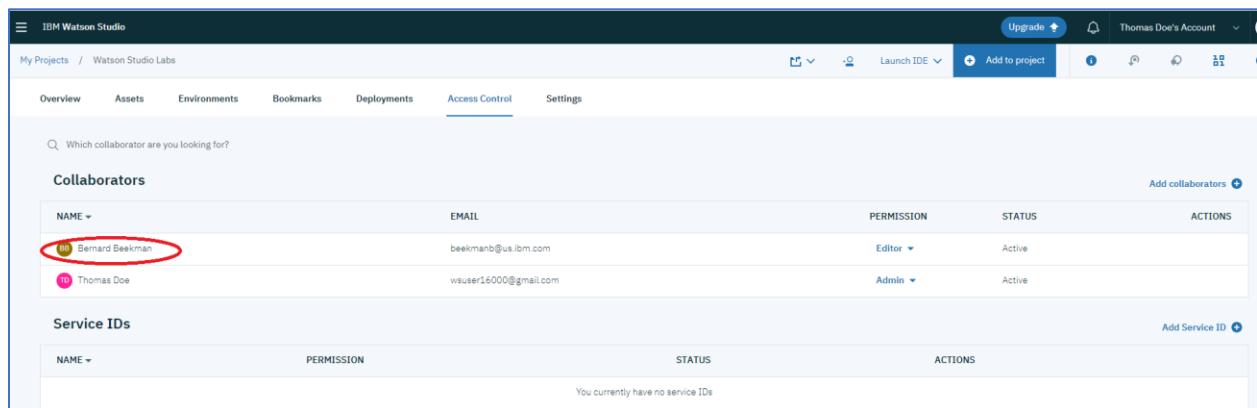
6. For **Invite**, enter the **PROJECT COLLABORATOR** e-mail address on the index card handed out by the instructor, press Tab key, select Editor from the **Access Level** dropdown, and click on **Add**.



7. The collaborator is added to the list of Collaborators on the right-hand side. Click on **Invite**.




8. The collaborator is added.

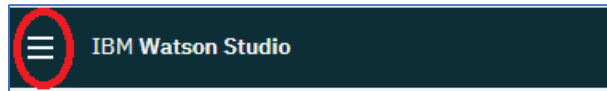


Research Topics

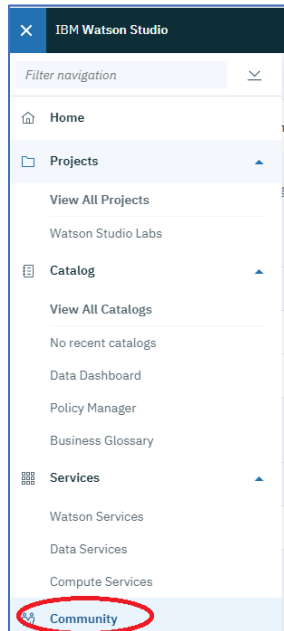
As you work on a data analysis project, you may need to do some research to help find a solution. Watson Studio provides a built-in learning capability, accessed via the **Community** option, that contains articles, sample notebooks, tutorials, sample datasets, and papers on a variety of topics. These are curated on a regular basis to provide up-to-date materials.

For the lab exercise, assume that you are interested in learning how to use the Watson Machine Learning api to save and deploy a machine learning mode. We will look for a sample notebook that demonstrates this capability and bookmark this capability in our project. **Note, we are doing this exercise for illustrative purposes on using the Community, and not for use in any subsequent lab.**

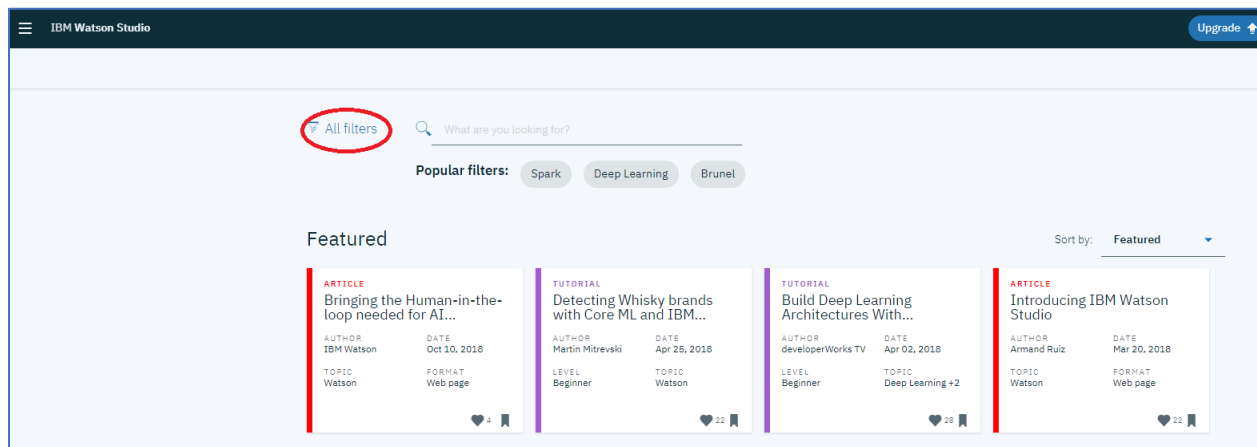
1. Click on the  icon.



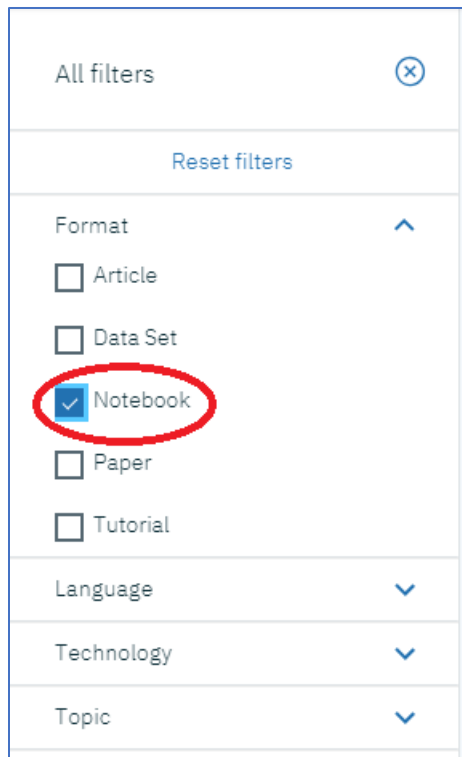
2. Click on **Community**.



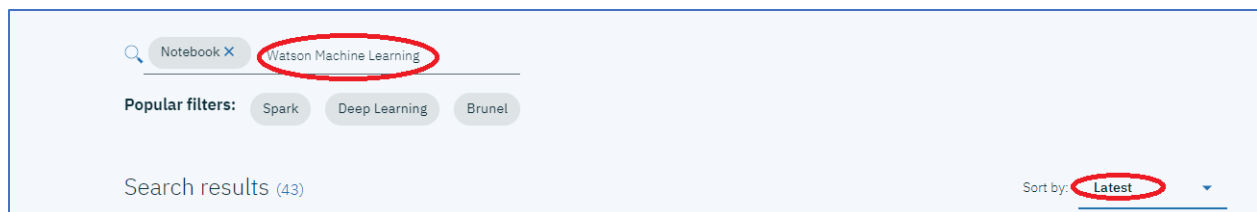
3. The Community Cards are displayed. Click on **All filters**.



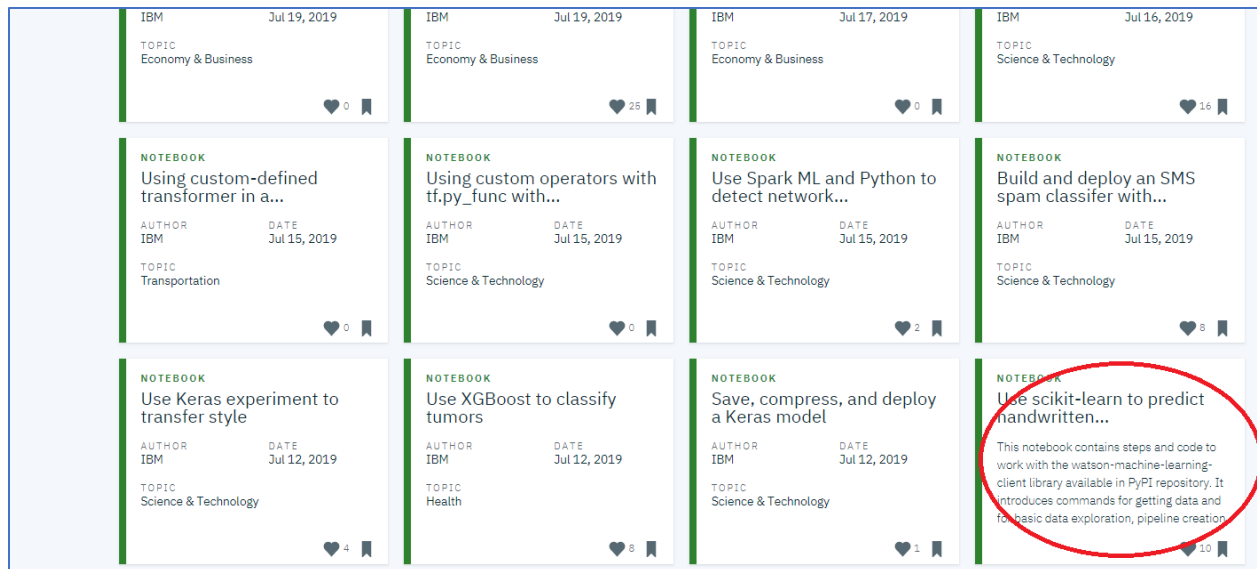
4. Click on **Notebook**.



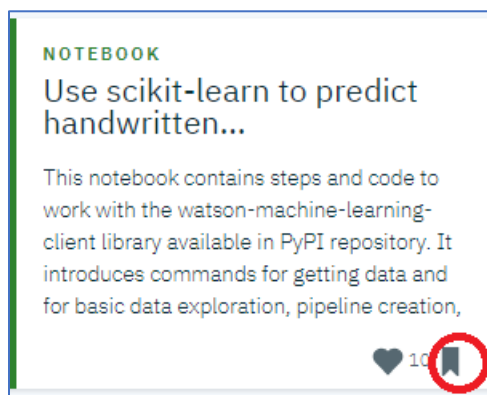
5. Enter **Watson Machine Learning** in the **Search** area. Click on the **Sort by** dropdown and change it to **Latest** to get the most up-to-date information.



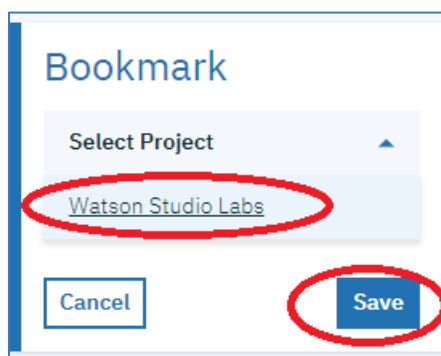
6. The Community view is updated. Scroll down to find the Community Card “Use scikit-learn to predict hand-written ...”. Hover the mouse over the card. The descriptive text refers to the Watson Machine Learning api. This notebook appears to be a good candidate for having code demonstrating the use of the Watson Machine Learning api. Let’s bookmark the notebook in the project.



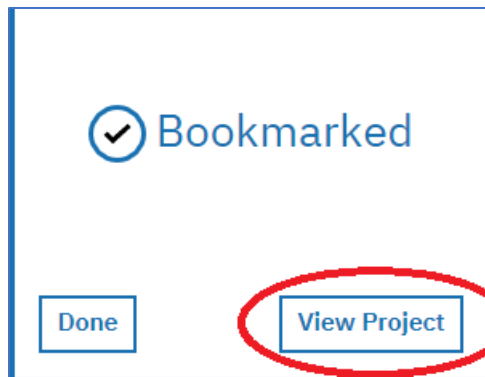
7. Click on the bookmark icon.



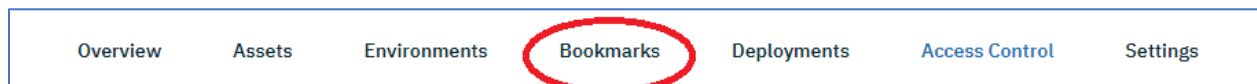
8. Click on the **Watson Studio Labs** project and click **Save**.



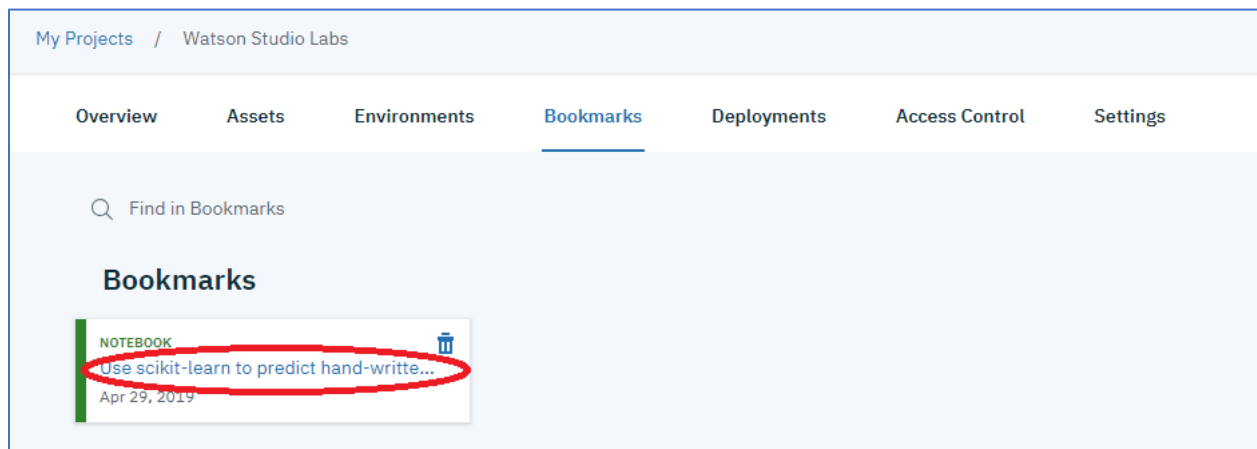
9. Click on **Done**.



10. Click on the **Bookmark** tab.



11. Click on the notebook.



12. Scroll to Section 4 to view the information on Watson Machine Learning apis. Again, this is just for illustrative purposes for this lab. We will revisit the Watson Machine Learning apis in subsequent labs.

4. Save, load, and delete a model in the WML repository

In this section, you will learn how to use the `watson-machine-learning-client` package to manage your model in the WML repository.

- [4.1 Set up the WML instance](#)
- [4.2 Save the model in the WML repository](#)
- [4.3 Load a model from the WML repository](#)
- [4.4 Delete a model from the WML repository](#)

Tip: You can find more information about the `watson-machine-learning-client` [here](#).

4.1 Set up the WML instance

First, import required modules.

```
In [ ]: from watson_machine_learning_client import WatsonMachineLearningAPIClient
```

Note: A deprecation warning is returned from scikit-learn package that does not impact watson machine learning client functionalities. Authenticate to the Watson Machine Learning service on the IBM Cloud.

Tip: Authentication information (your credentials) can be found in the [Service credentials](#) tab of the service instance that you created on the IBM Cloud. If you cannot find the `instance_id` field in **Service Credentials**, click **New credential (+)** to generate new authentication information.

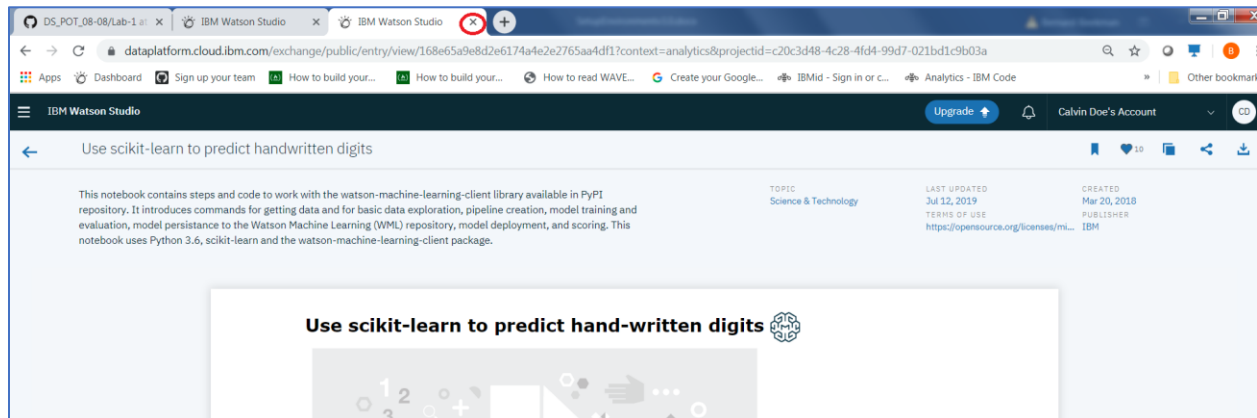
Action: Enter your Watson Machine Learning service instance credentials here.

```
In [19]: wml_credentials={
         :   'url': 'https://ibm-watson-ml.mybluemix.net',
         :   'access_key': '*****',
         :   'username': '*****',
         :   'password': '*****',
         :   'instance_id': '*****'
         : }
```

Instantiate the WML API client object.

```
In [21]: client = WatsonMachineLearningAPIClient(wml_credentials)
```

13. Close the IBM Watson Studio browser tab with the notebook.



You have completed Lab-1!

- ✓ Created a project
- ✓ Created an object storage instance and associate it with the project
- ✓ Associated an existing Watson Machine Learning service instance with the project
- ✓ Added a collaborator to the project

- ✓ Demonstrated researching topics by searching the Community

