IBM Cloud

DEEP BELIEF NETWORK

Training a model for visual recognition using deep belief networks and IBM Watson Studio

Lab Guide

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Table of Contents

Lab Environment Overview

Module 1: Deep Belief Networks in WATSON STUDIO

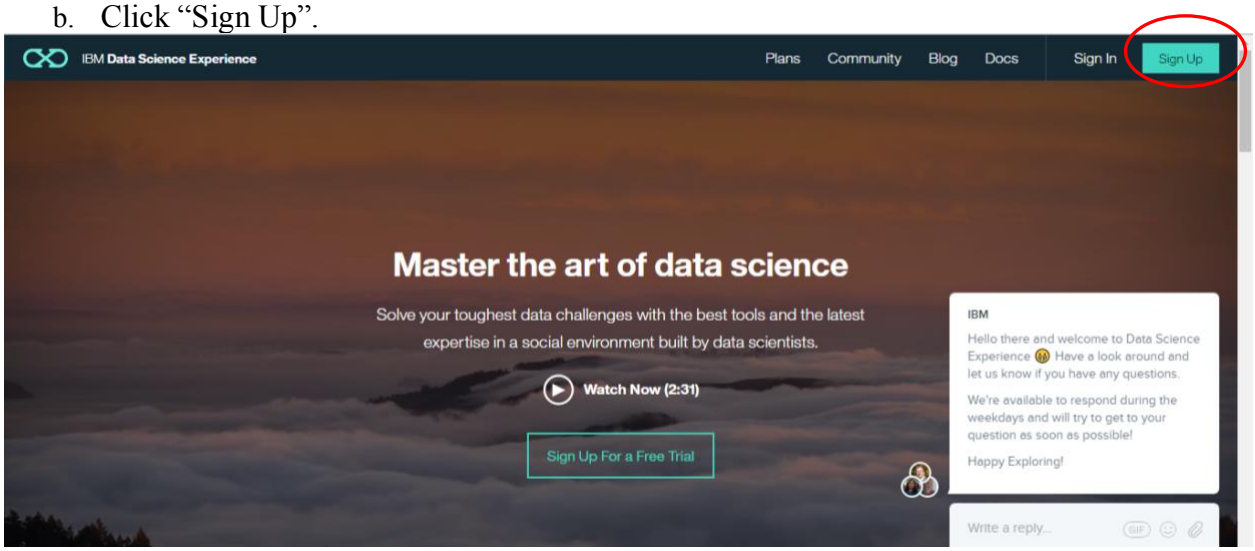
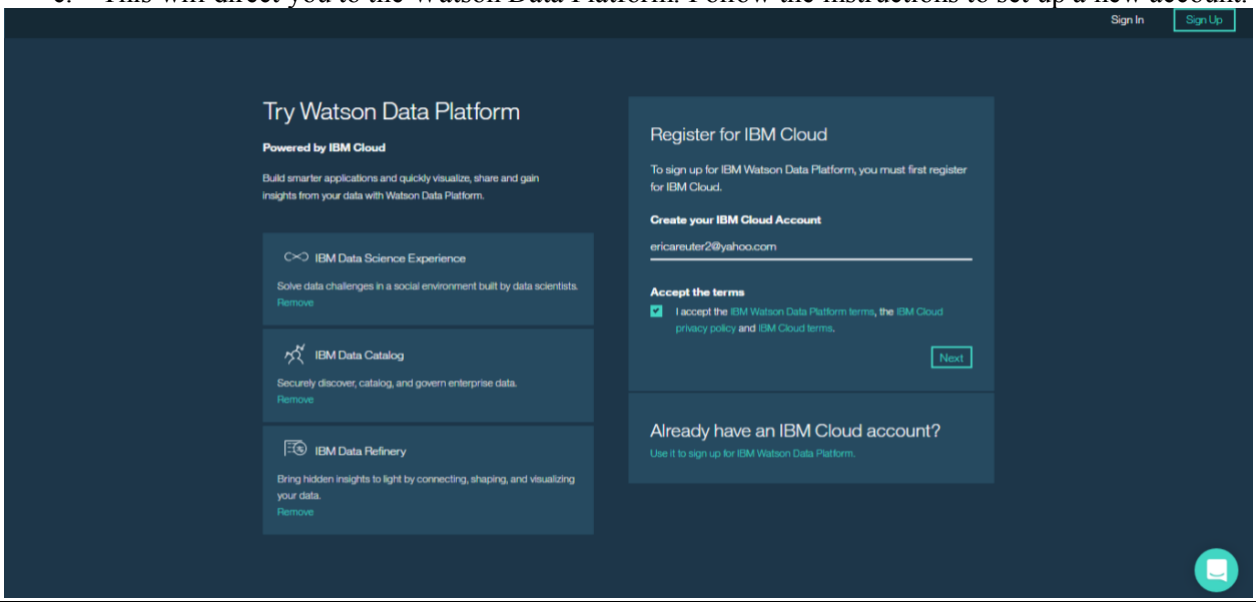
Purpose:	The purpose of this lab is to set up an IBM Cloud Account, access and run notebook in WATSON STUDIO, and program a deep belief network for visual recognition. By the end of this lab, you will be familiar with the following: • Navigating IBM Data Science Experience • Creation and use of deep belief networks • Familiarity with Cloud Services

Tasks:	Tasks you will complete in this lab exercise include: • Set up your IBM Account with WATSON STUDIO • Lean, Create, Collaborate! • Hands-on, Create and Collaborate • Conclusion

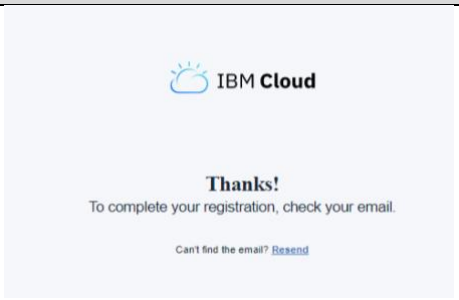
Module 1: Lab Workflow Overview

1. Set up your IBM Cloud Account with WATSON STUDIO
2. Learn, Create, Collaborate!
3. Hands-on, Create and Collaborate
4. Conclusion

Lab Instructions

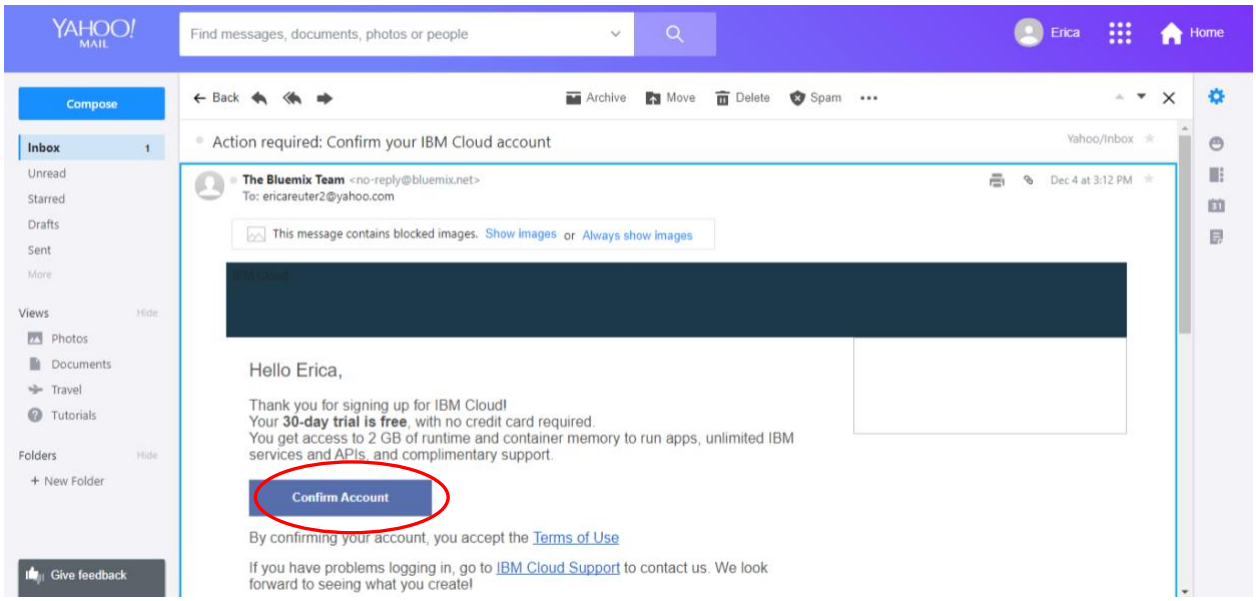
Step	Action
1	**Set up your IBM Cloud Account with WATSON STUDIO** a. Log into IBM Data Science Experience at http://datascience.ibm.com/ b. Click "Sign Up".  c. This will direct you to the Watson Data Platform. Follow the instructions to set up a new account. 

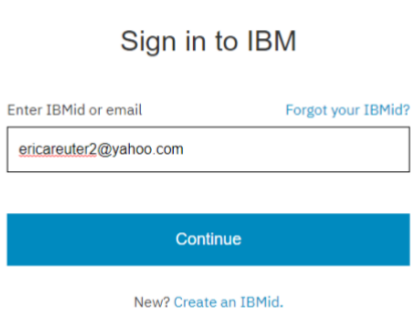
Step	Action

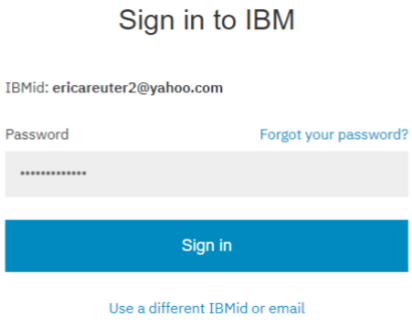


d. You will need to log into your email account to confirm and complete account registration.

e. Select the "Confirm Account" link in the email to be redirected to IBM Cloud.

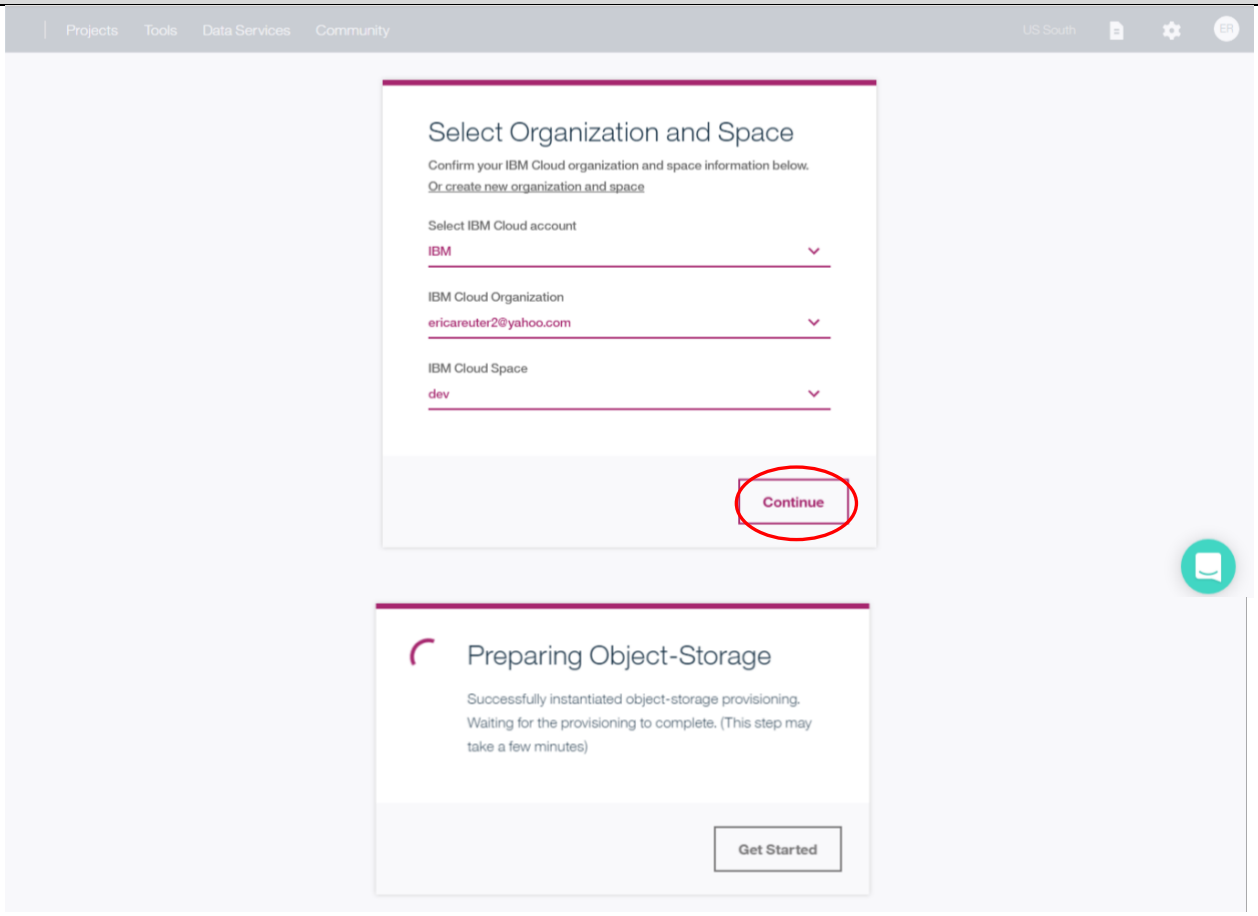
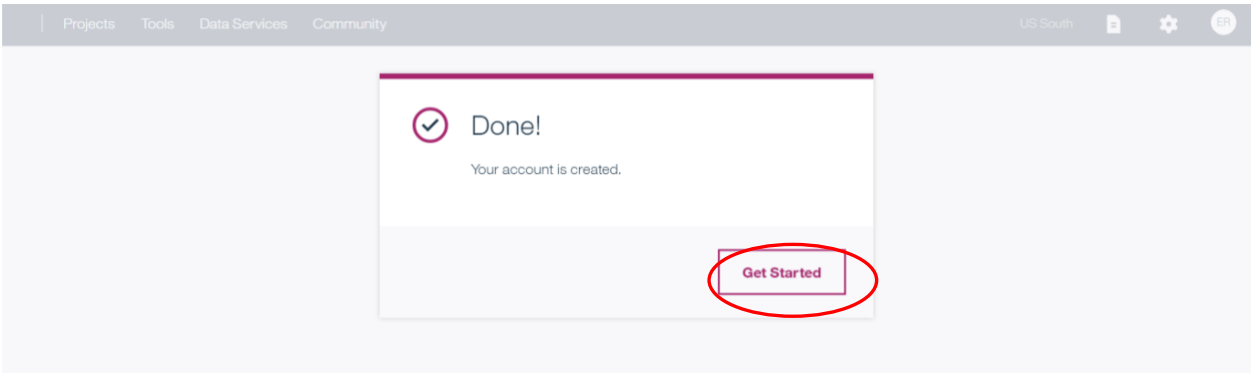


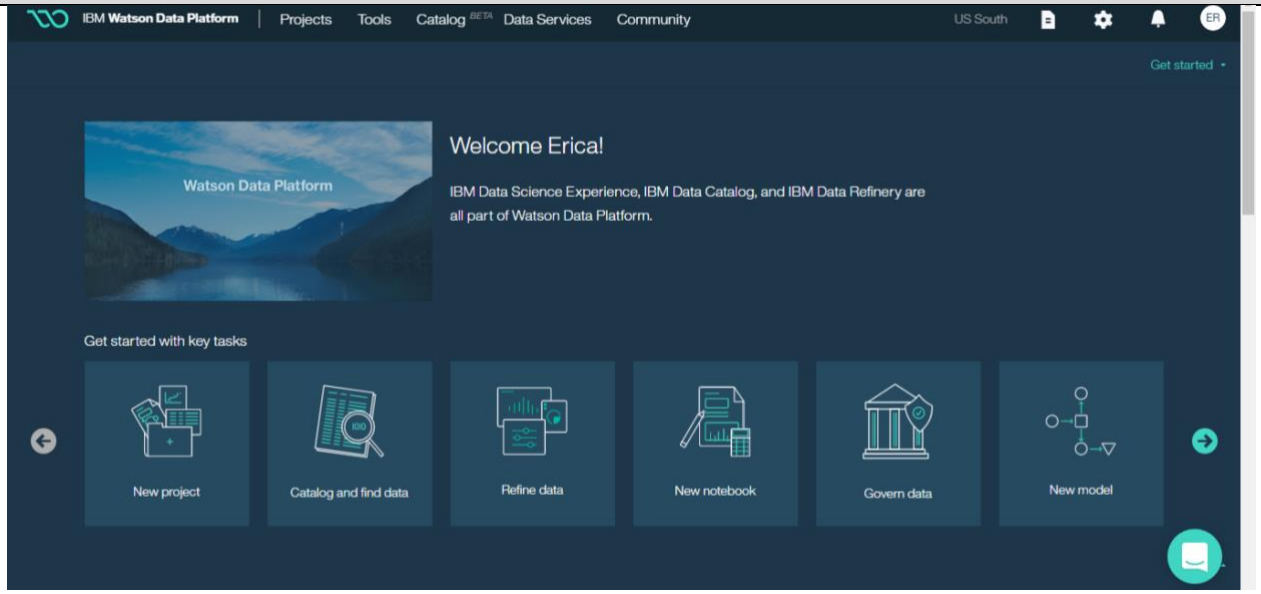
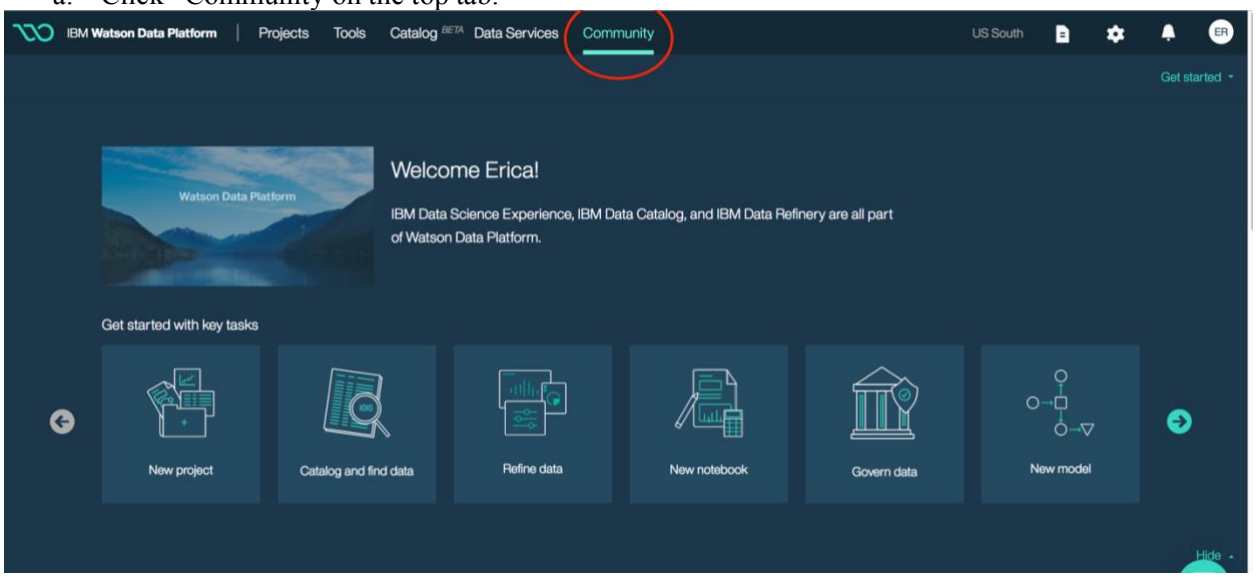




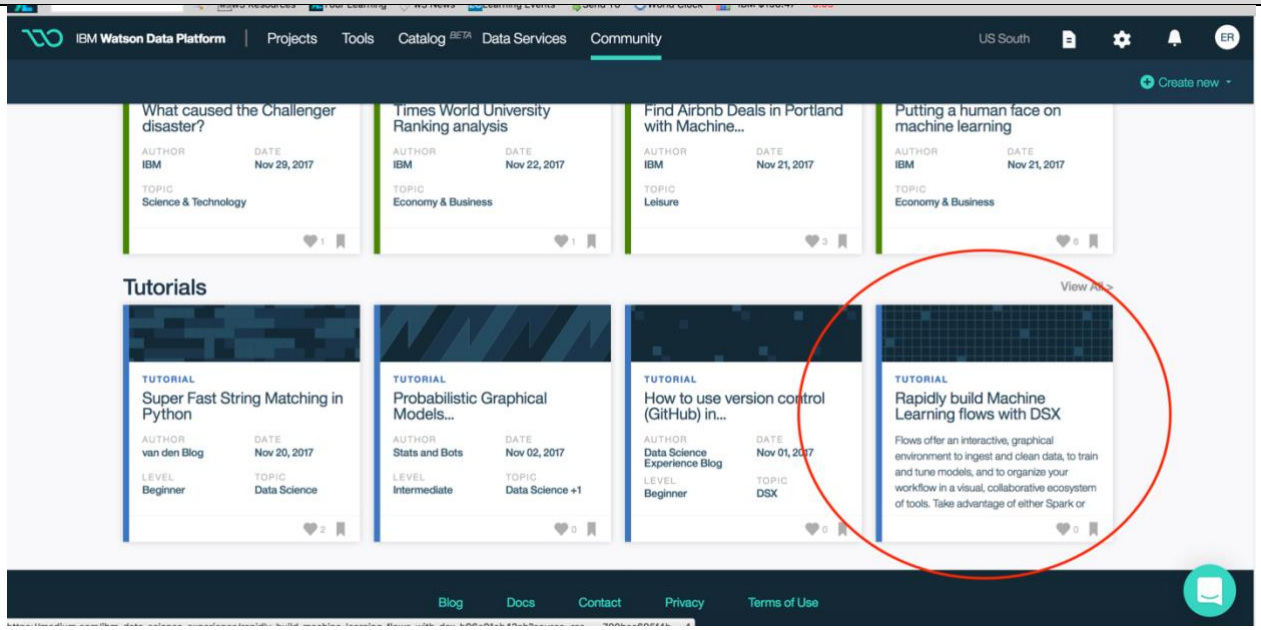
f. When you first sign into your new account, you will need to select and organization and space.

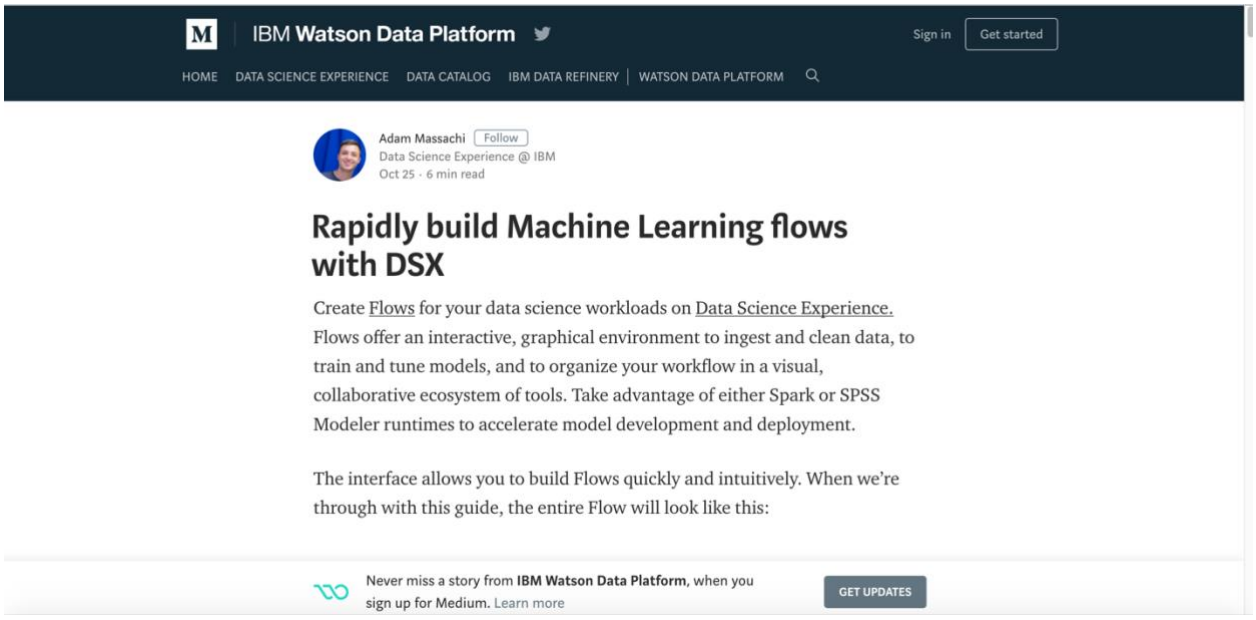
g. We will be using the default options for this lab. Click "Continue".

Step	Action
	 h. Once you see that the Object-Storage is done provisioning, click “Get Started”. 

Step	Action
	
2	**Part 2: Learn, Create, Collaborate!** a. Click "Community on the top tab.  b. Scroll down to the tutorials and click on "Rapidly build Machine Learning flows with WATSON STUD

Step	Action

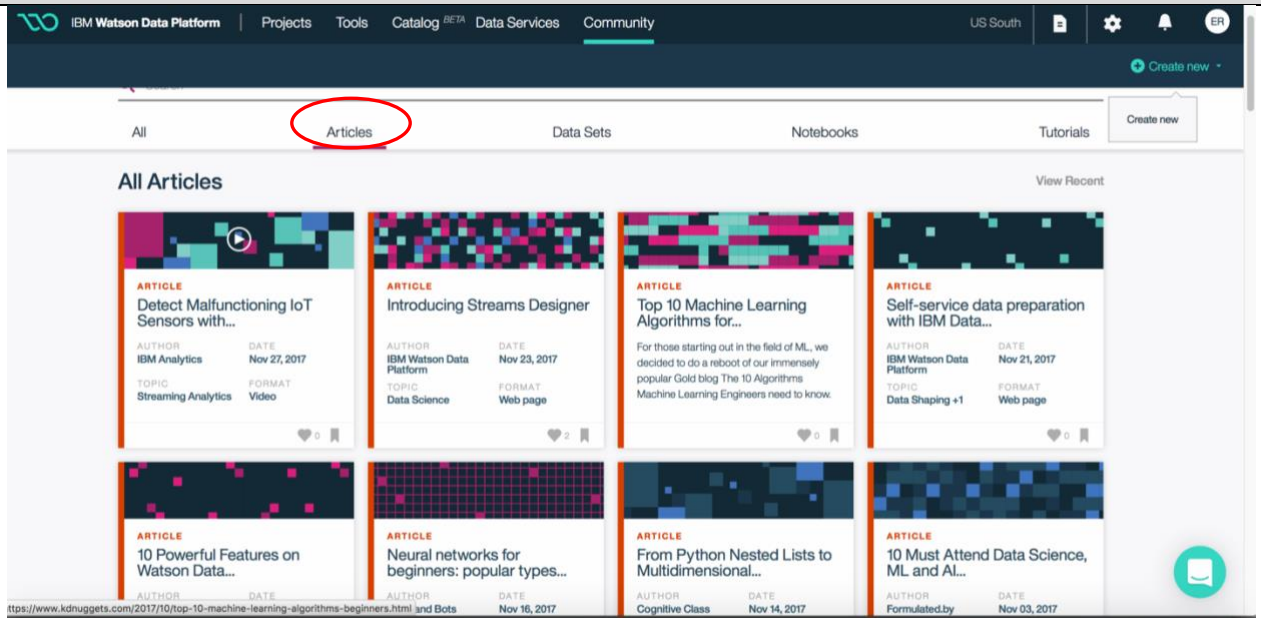




c. Once you're done reviewing the tutorial, close the tab to return to the main area of WATSON STUDIO.

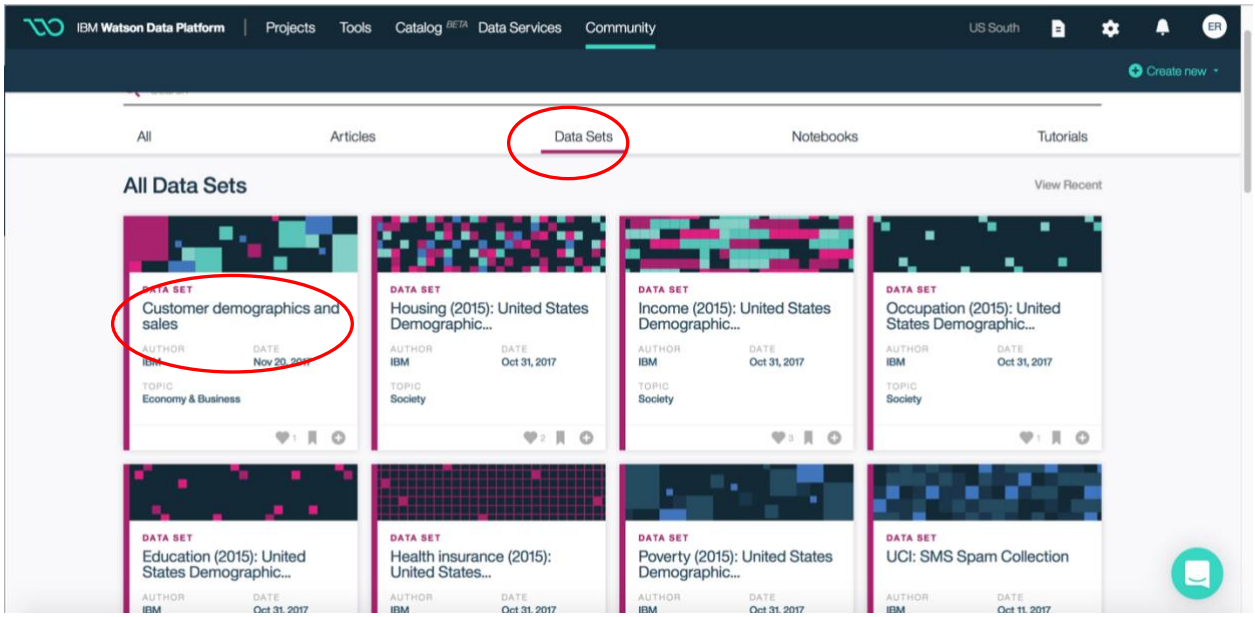
d. Click "Articles", and hover over several cards to see a summary of the types of articles added in the com

Step	Action



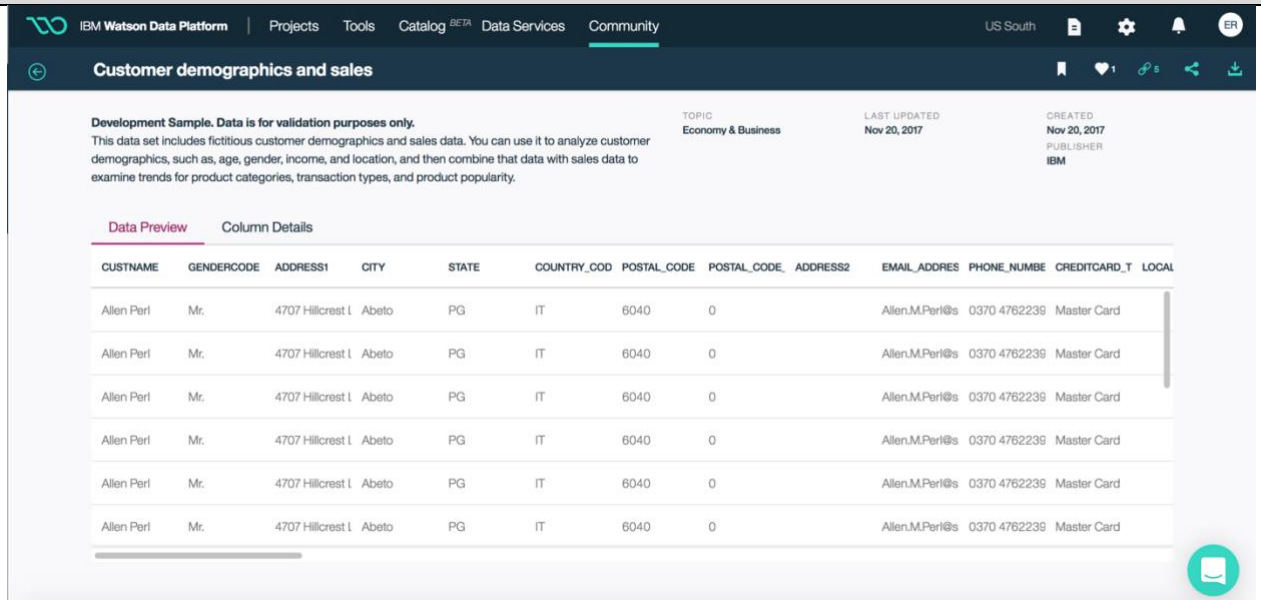
e. Click “Data Sets”.

f. Type into the search bar, “Customer demographics and sales”.

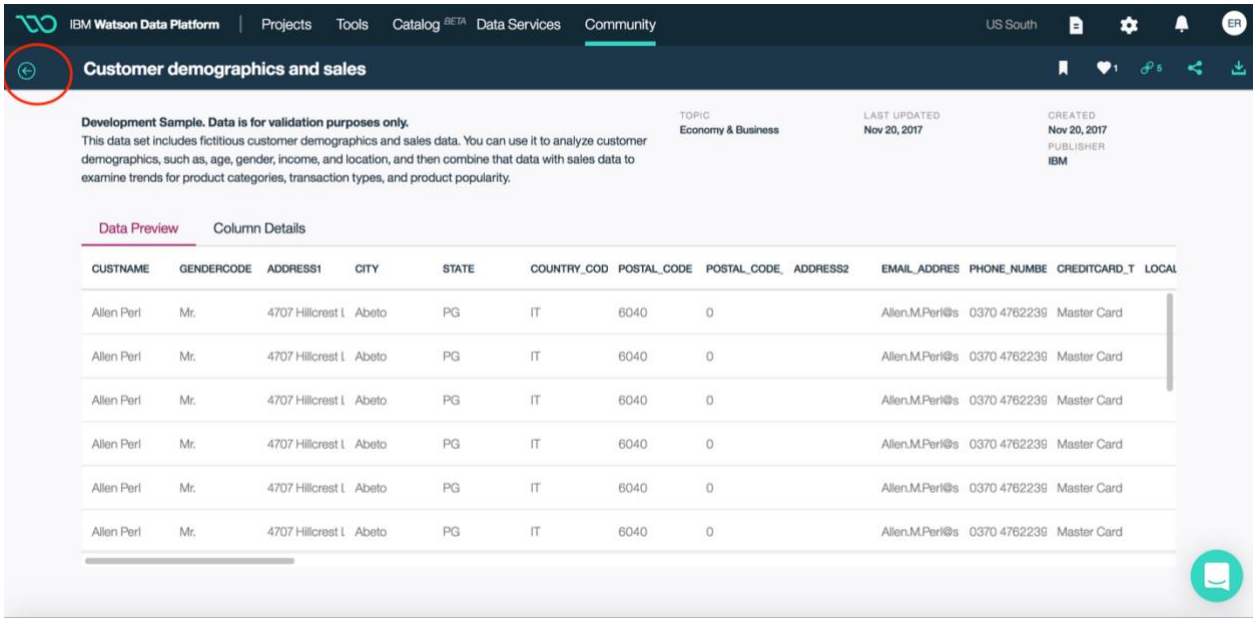


g. Look at the data.

Step	Action

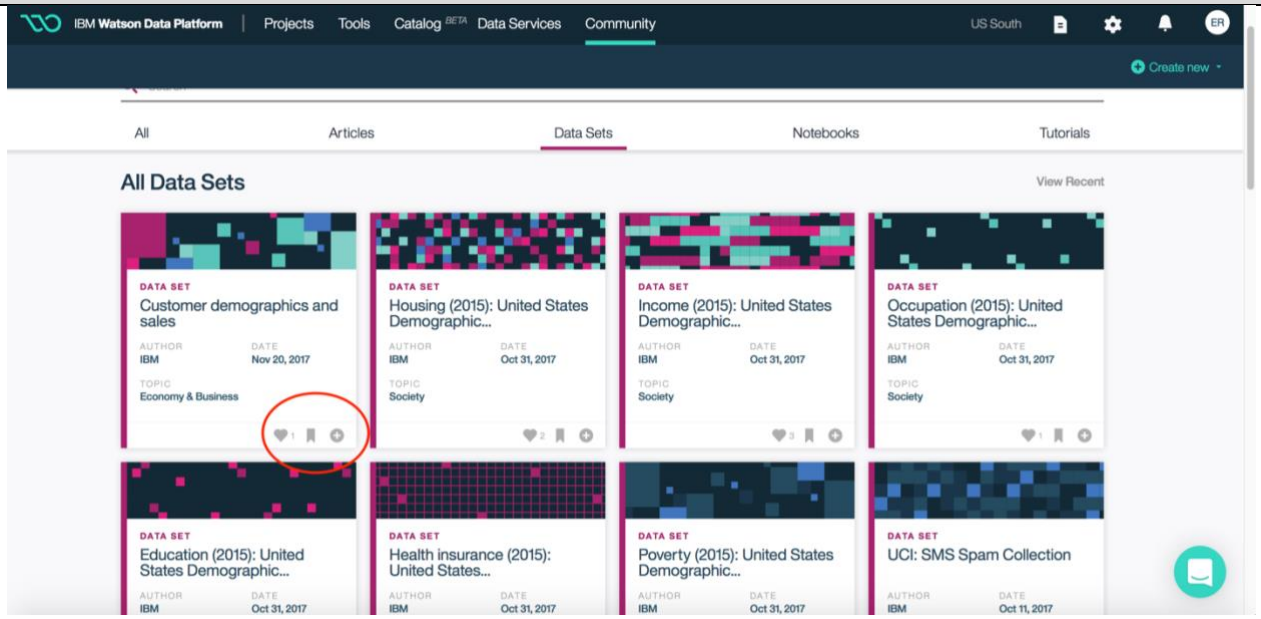


h. Exit the data set by clicking on the back arrow.

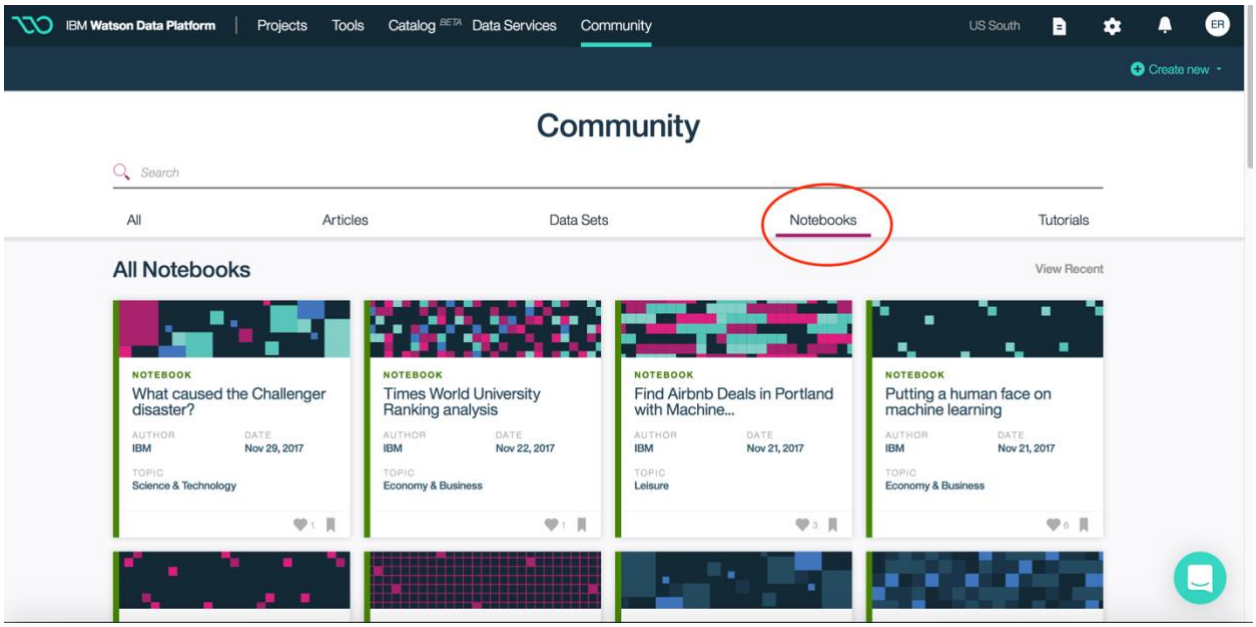


i. Once we have created some projects to organize our work, we can add these datasets to them by clicking bottom of the card or bookmarking them to add them to the project as well as save their location for futu

Step	Action

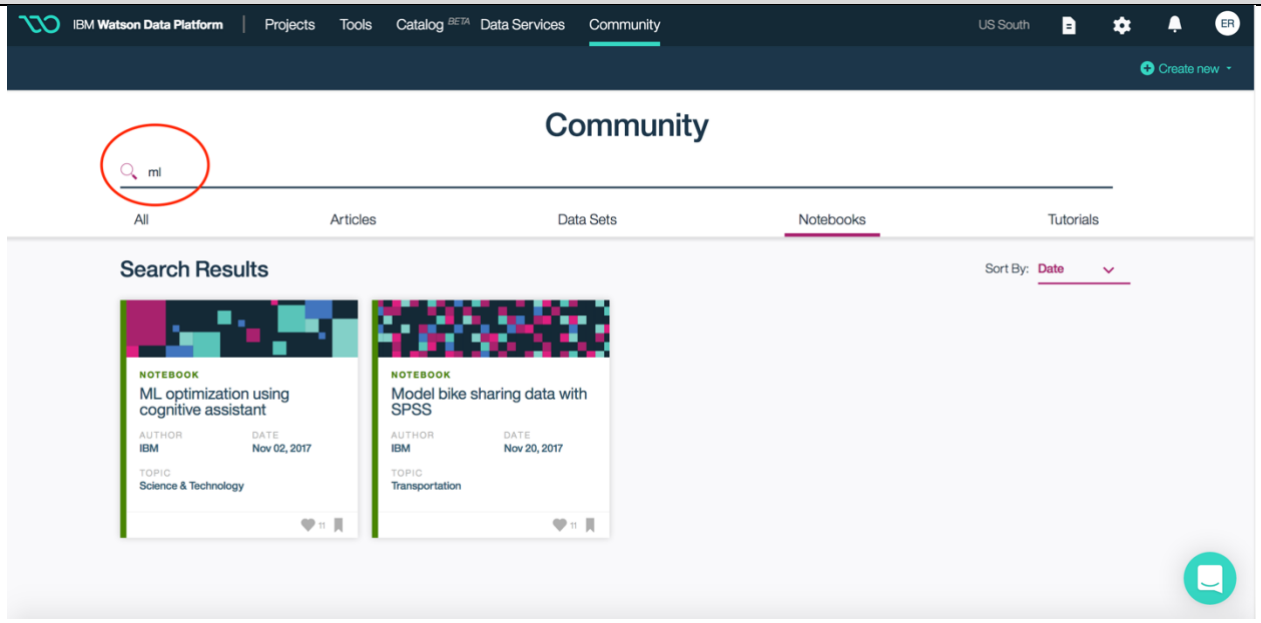
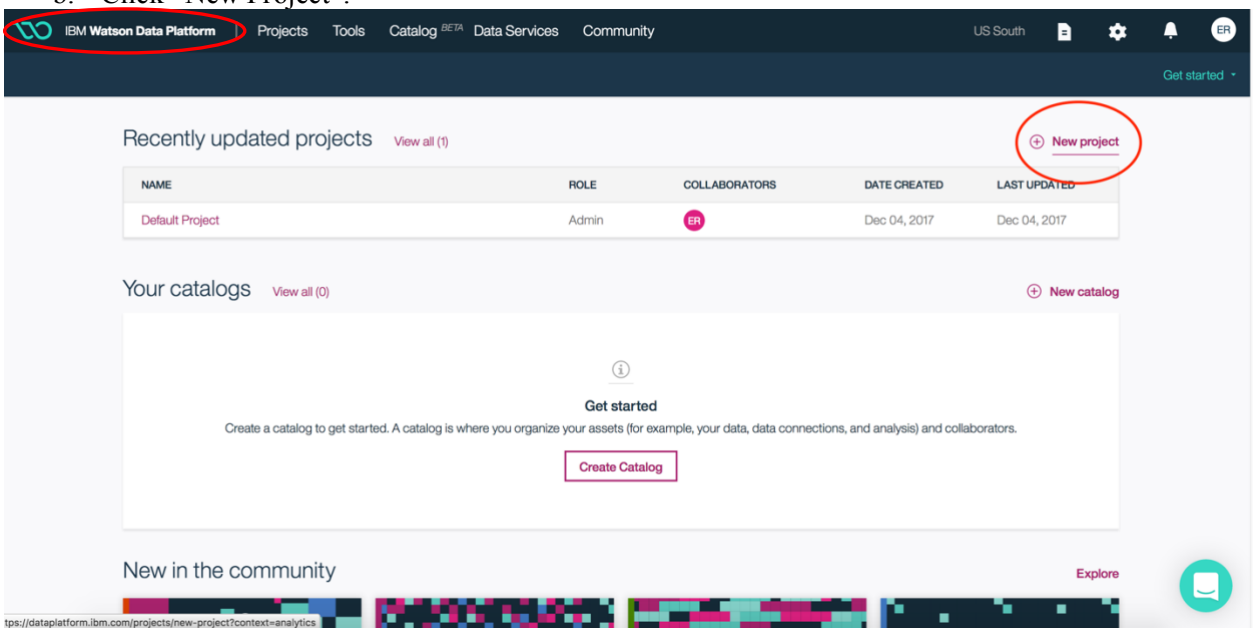


j. Click " Notebooks".

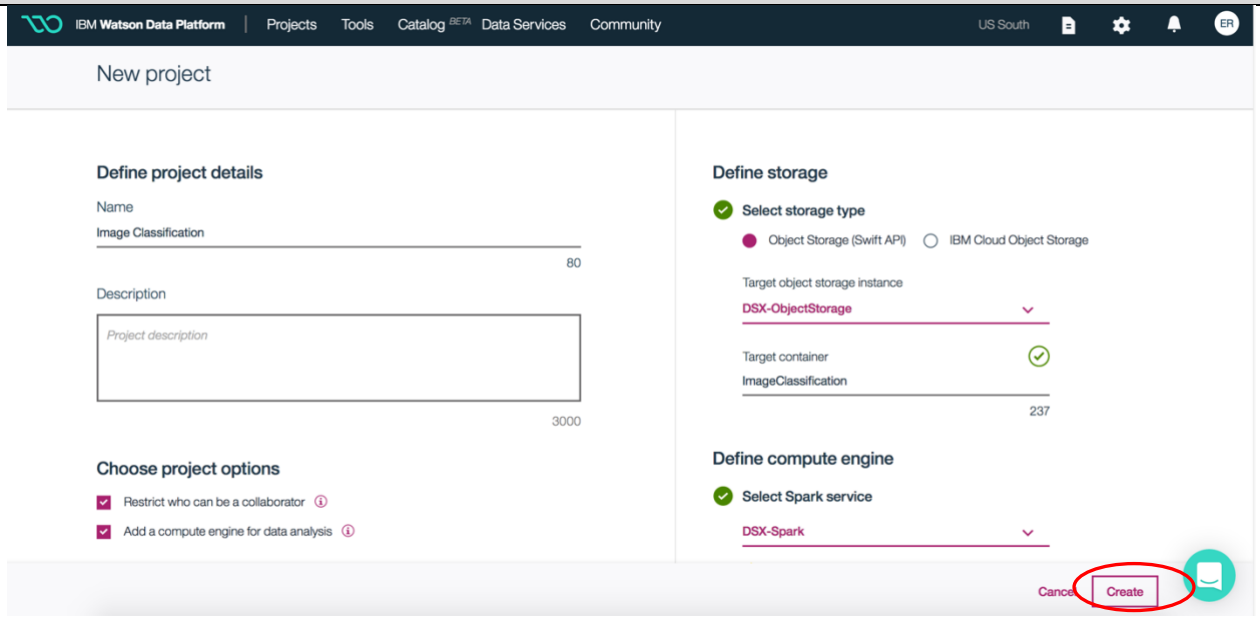


k. Roll your mouse over several notebooks to read the descriptions of what is available. Note that we can t prefer to search rather than browse.

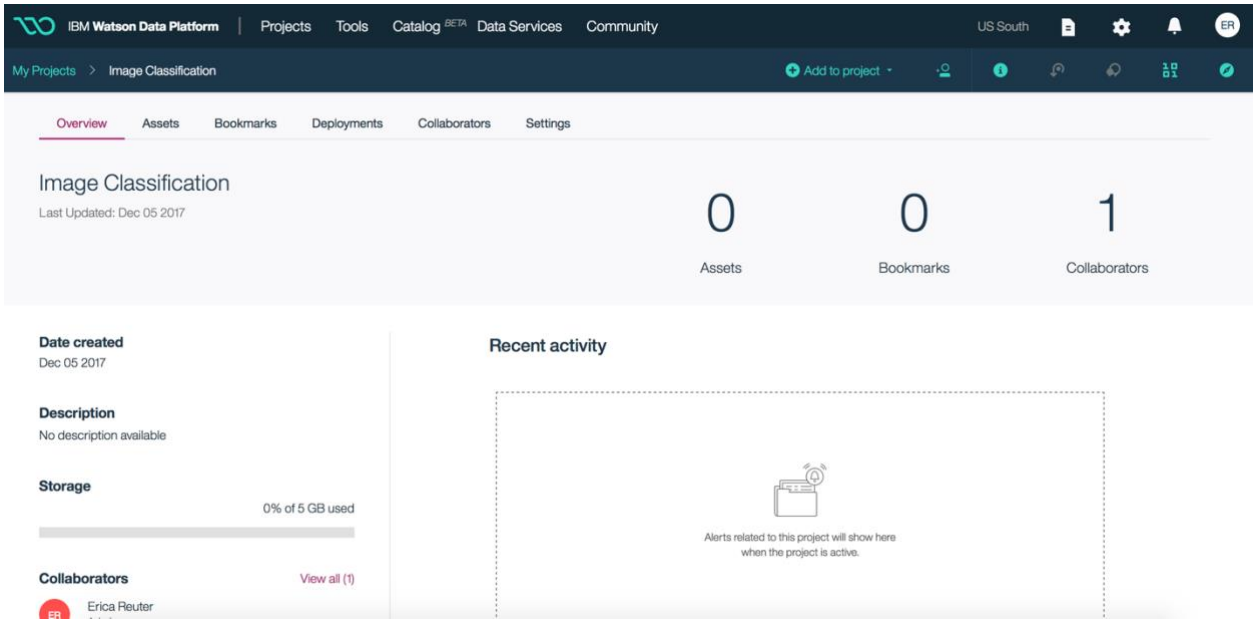
l. Type ML into the search and notice how the notebooks filter to those applicable to the search term

Step	Action
	
3	**Part 3: Hands-on, Create and Collaborate** a. Click "Watson Data Platform" on the top left corner of the screen to return to the home page of WATSC b. Click "New Project".  c. Name your project "Image Classification". d. Click "Create" once all fields are completed.

Step	Action

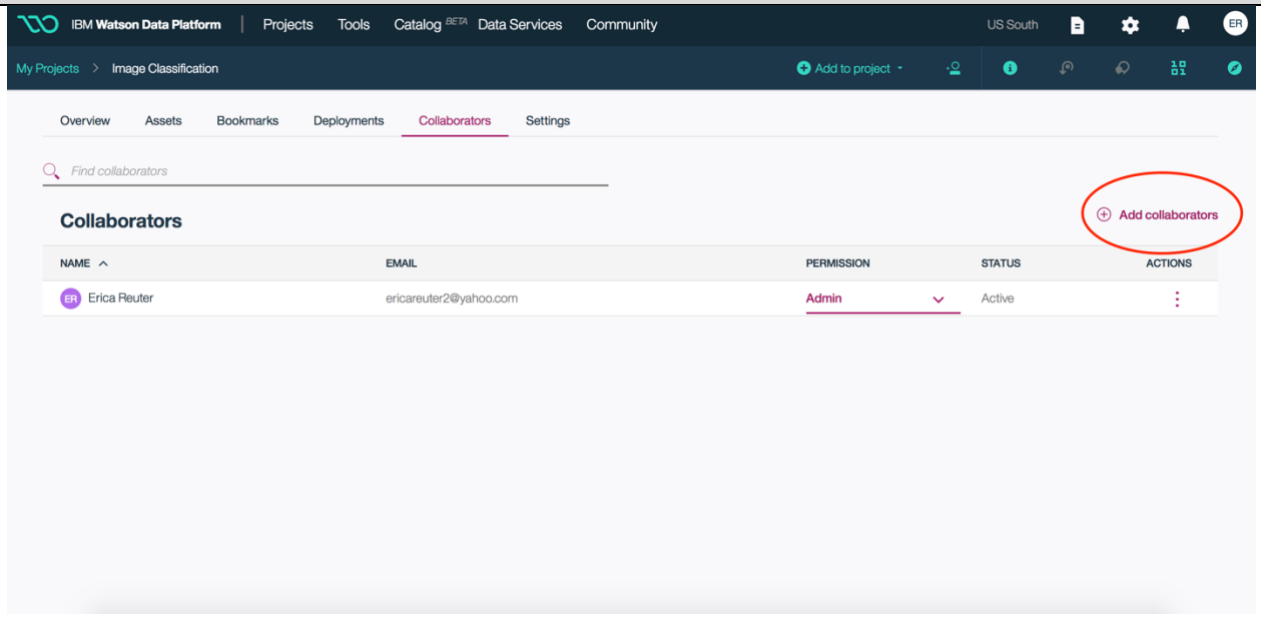


e. We now have a project workspace created.



f. Click on the collaborators tab and click “add collaborator”

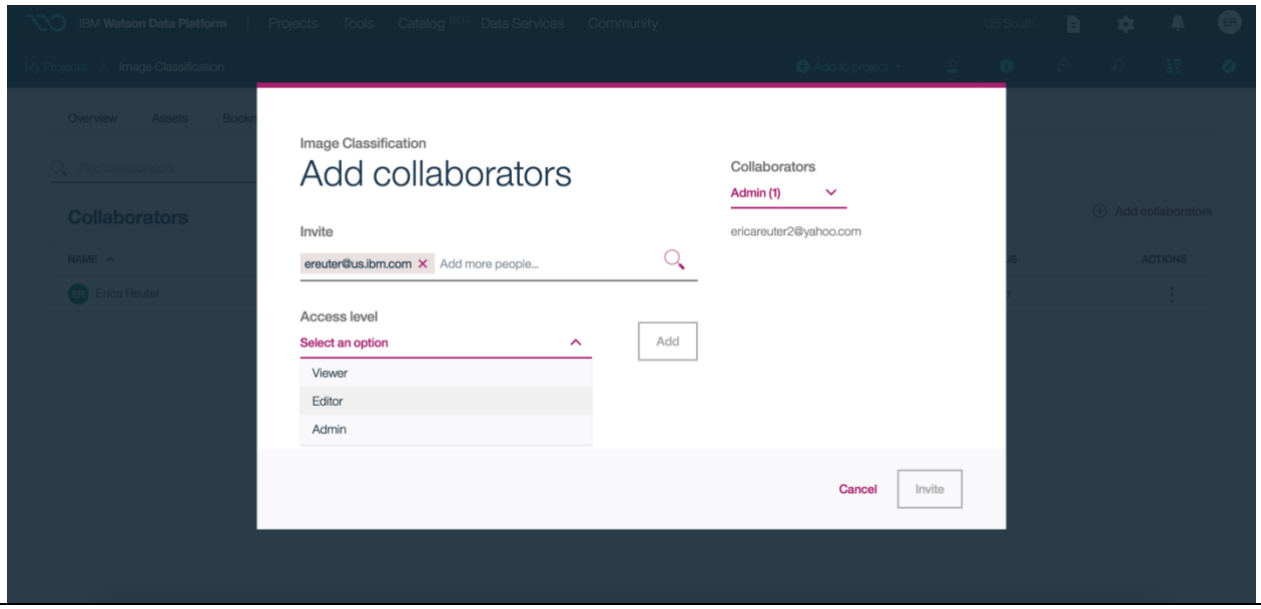
Step	Action

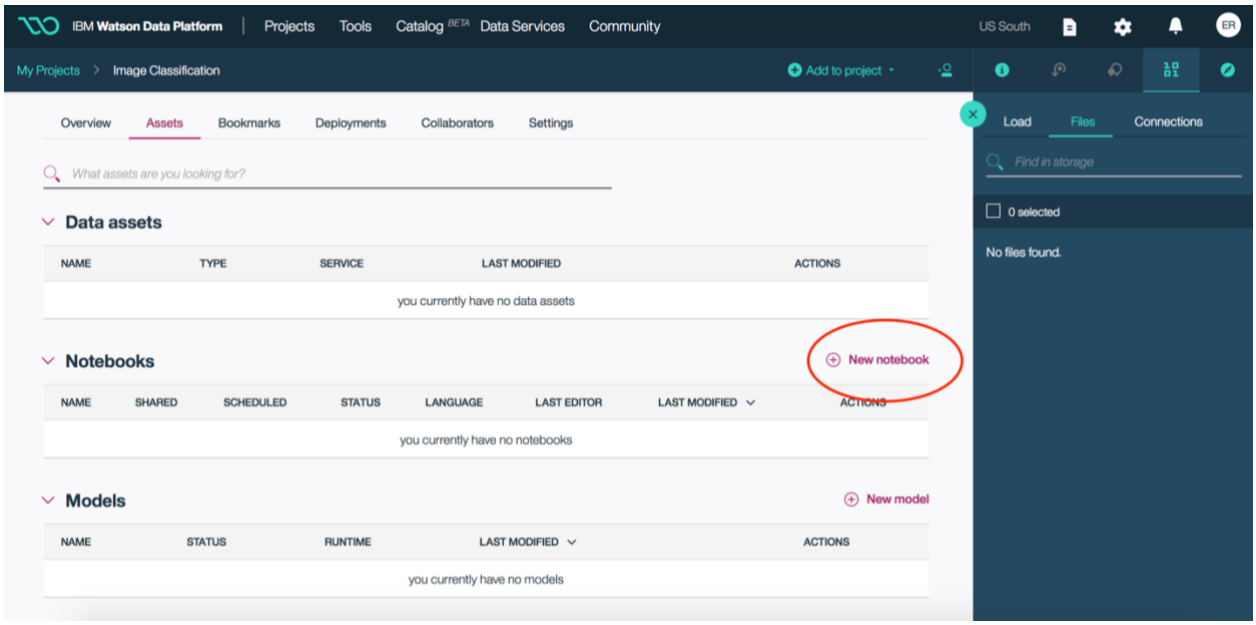


g. Since we did not restrict collaborators we can add anyone with an email address to this project and they as see the progress we're making.

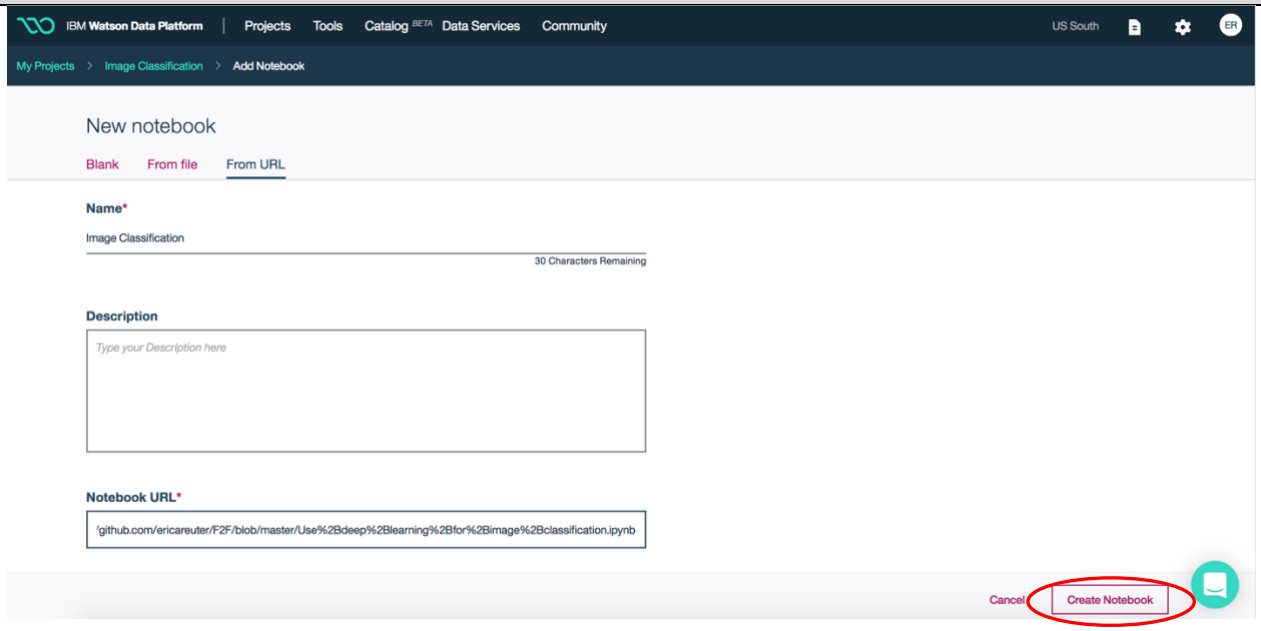
h. Add a secondary email address for yourself, or if you wish add me or Erika to your project:
ereuter@us.ibm.com
erika.bratschun@ibm.com

i. Maybe you don't trust us to make any edits to your notebooks, so set us as viewers, click add then invite

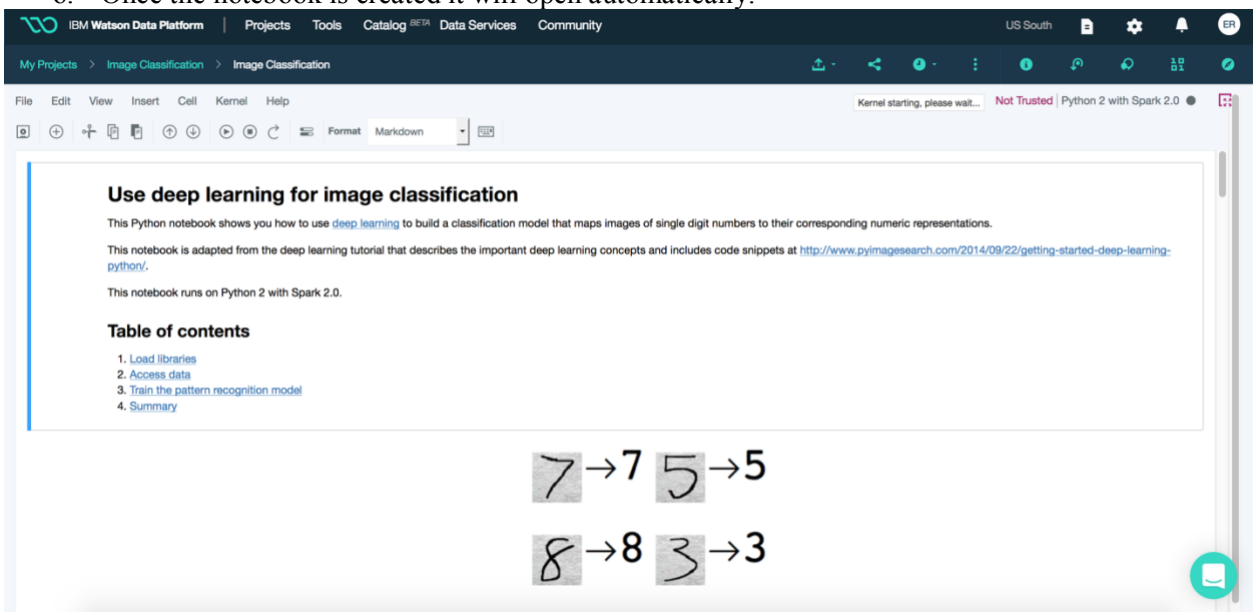


Step	Action
	j. Enter your project environment and click “New notebook”.  k. Click on the URL tab and fill in the fields as below. l. Provide the name “Image Classification” m. Enter the below link for the notebook URL: https://github.com/ericareuter/F2F/blob/master/Use%2Bdeep%2Blearning%2Bfor%2Bimage% The default spark service will be used, no need to make changes. n. Click “Create Notebook” once all fields are completed.

Step	Action

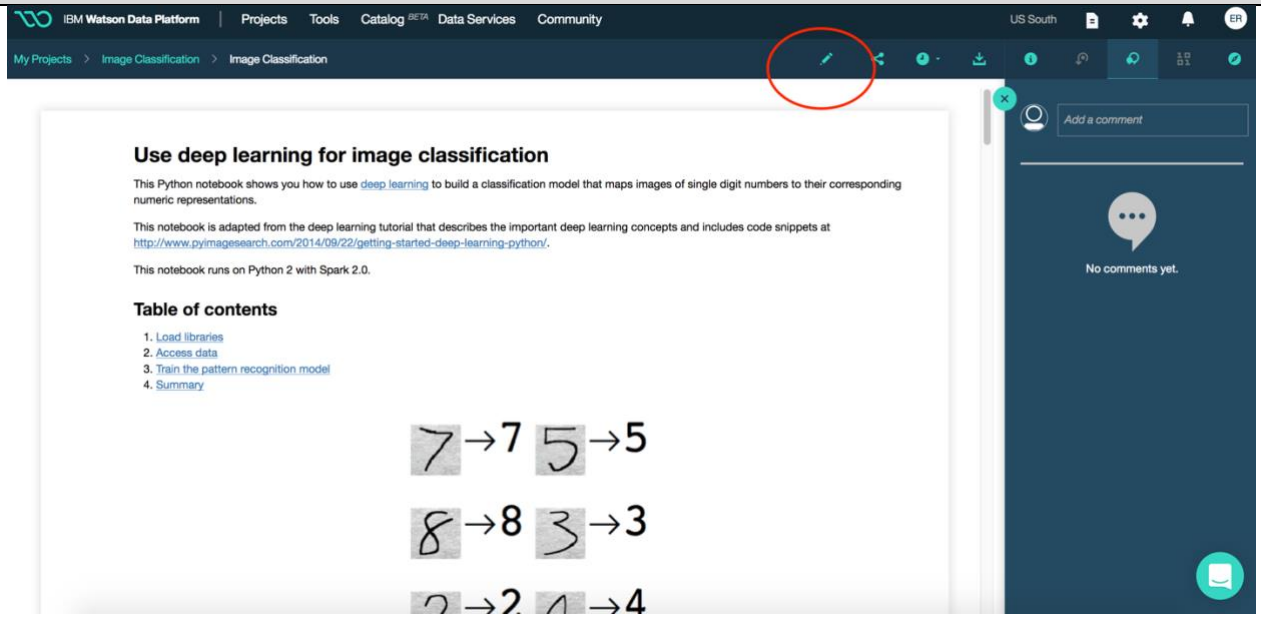


o. Once the notebook is created it will open automatically.

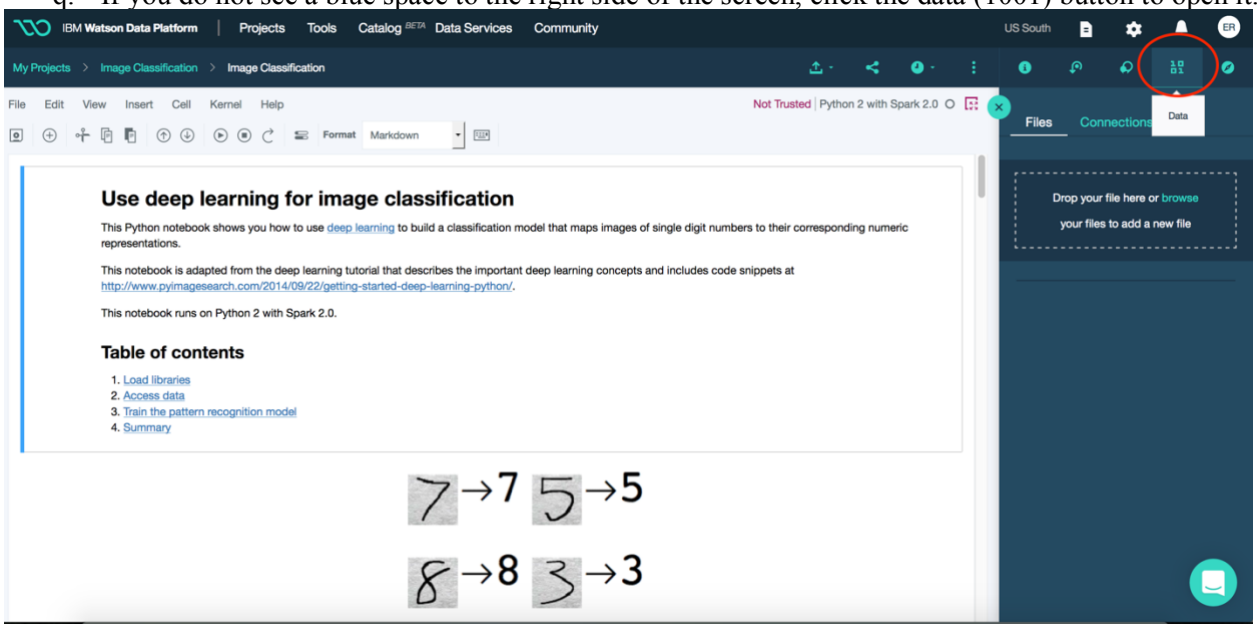


p. Click the edit icon (pencil) to allow for interactivity with the notebook if it is not already in edit mode.

Step	Action



q. If you do not see a blue space to the right side of the screen, click the data (1001) button to open it.

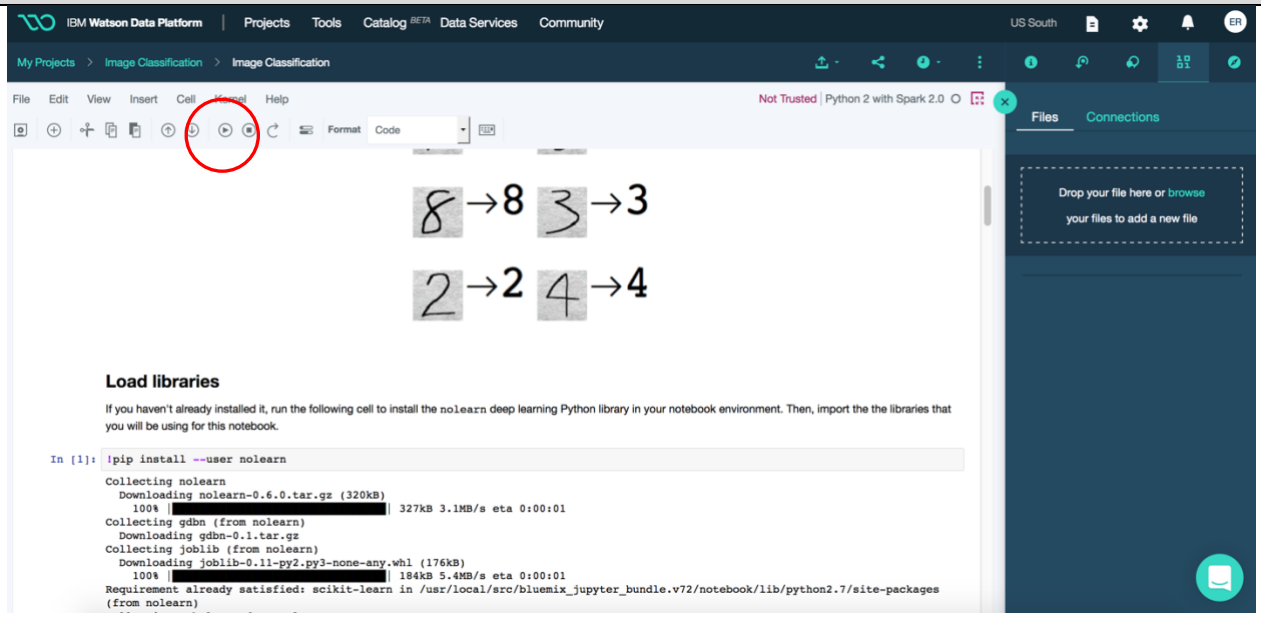


r. Now we're ready to look at how this image classification is done in a coding environment.

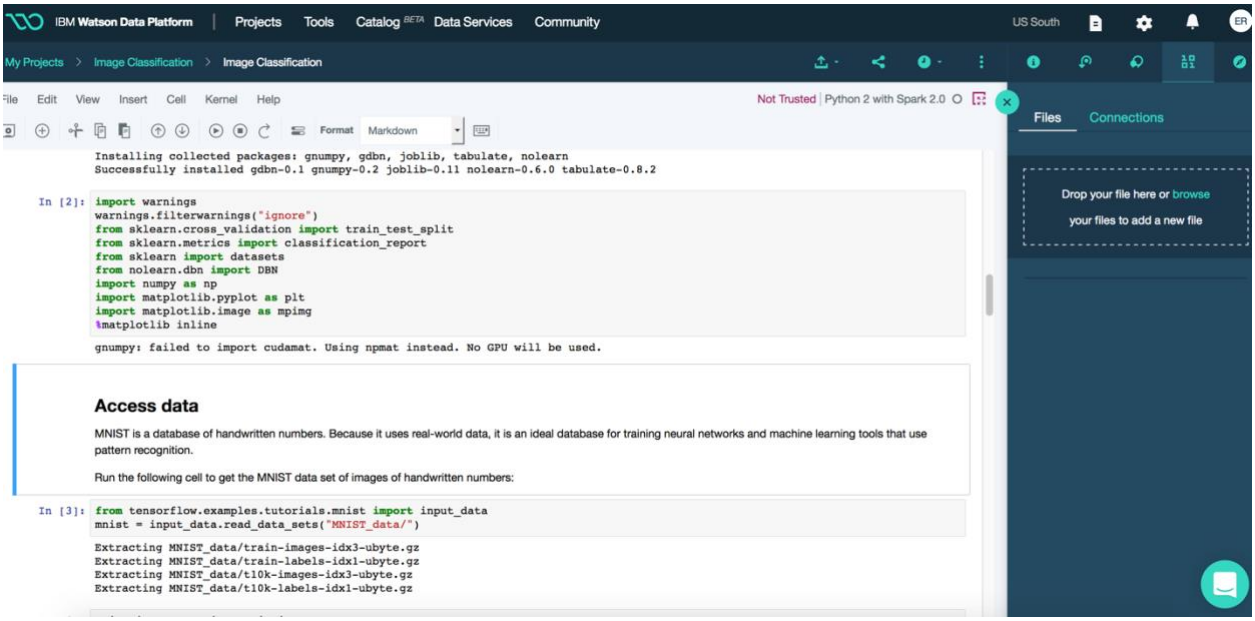
Run cell 1

s. To do this, click on the play button.

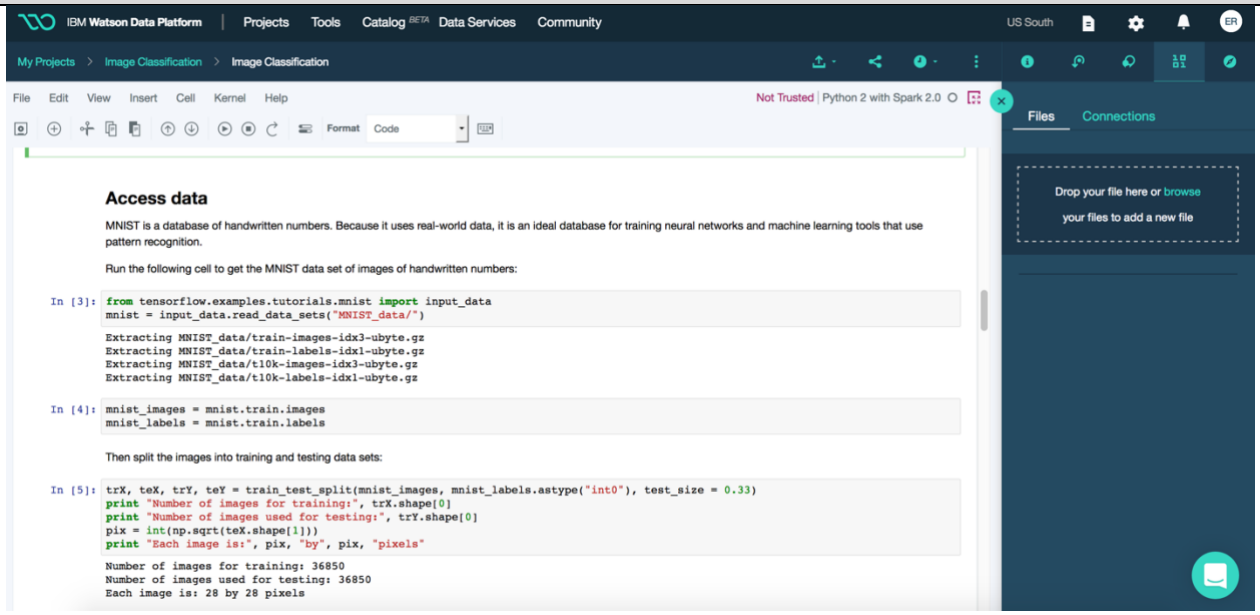
Step	Action



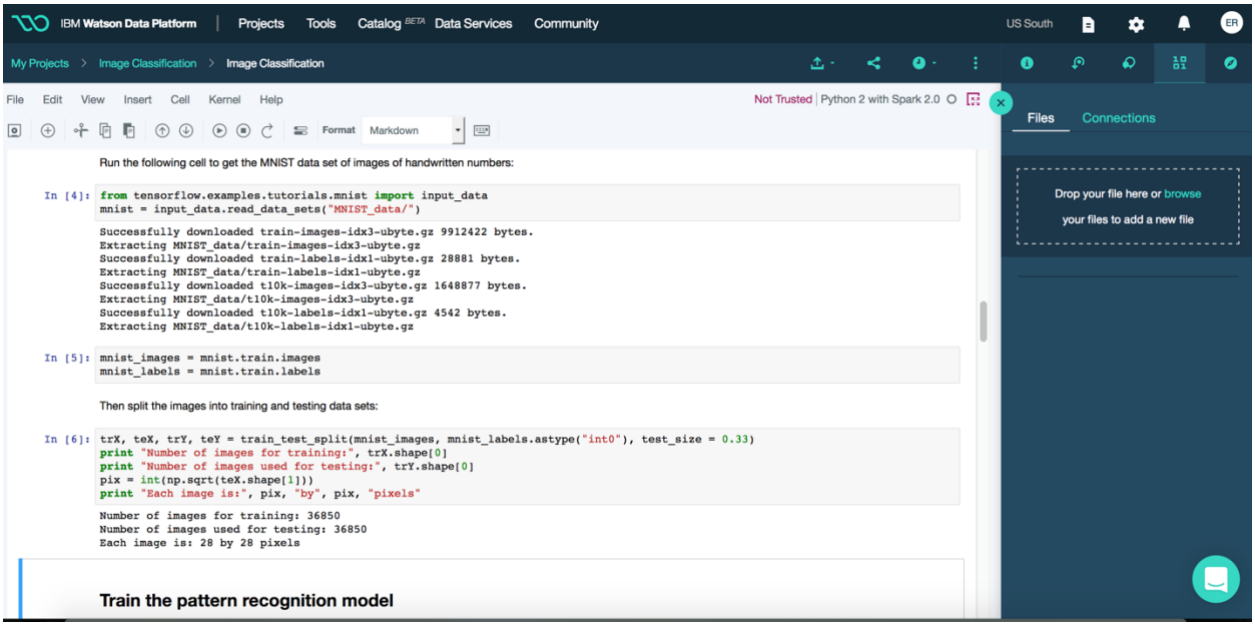
Run cell 2



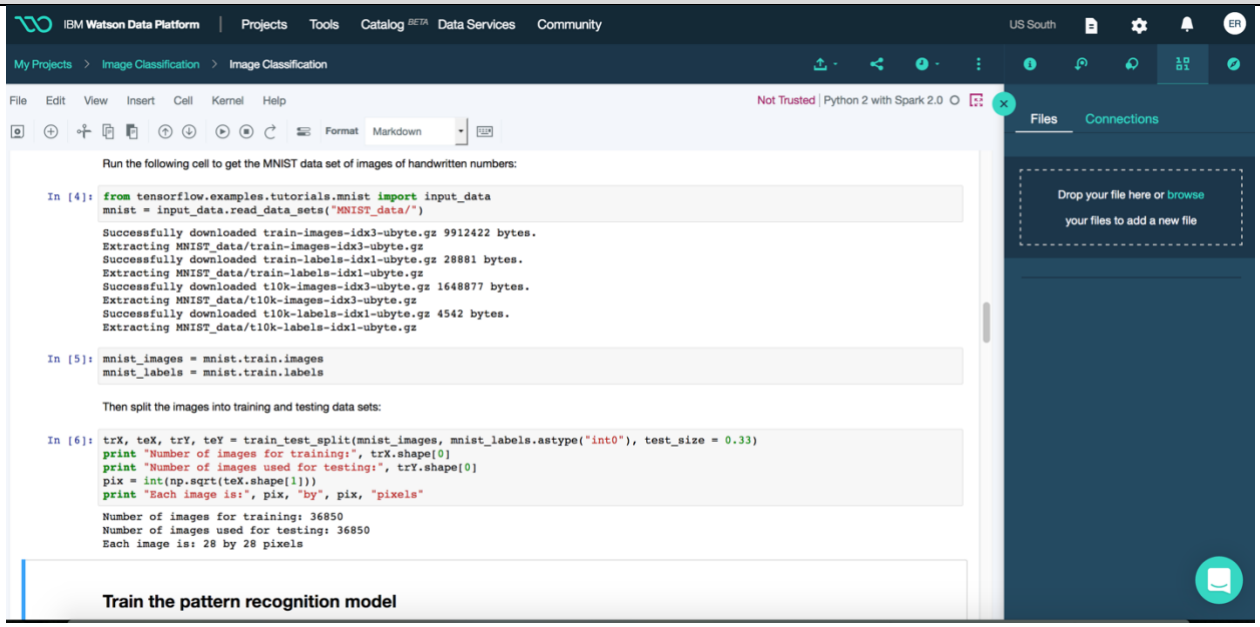
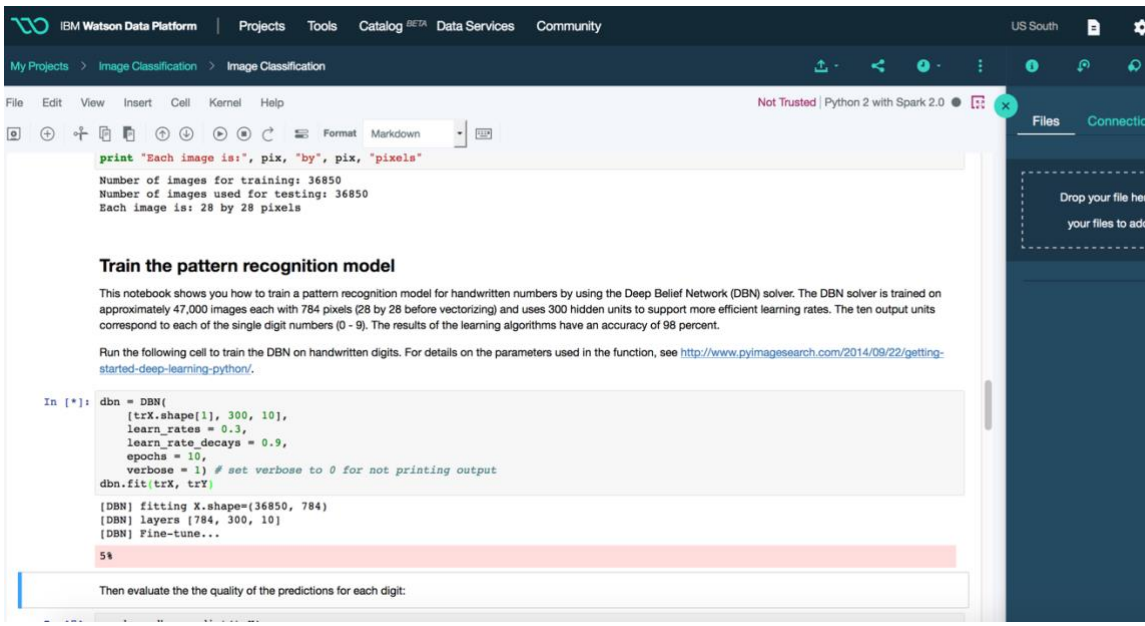
Run cells 3 and 4

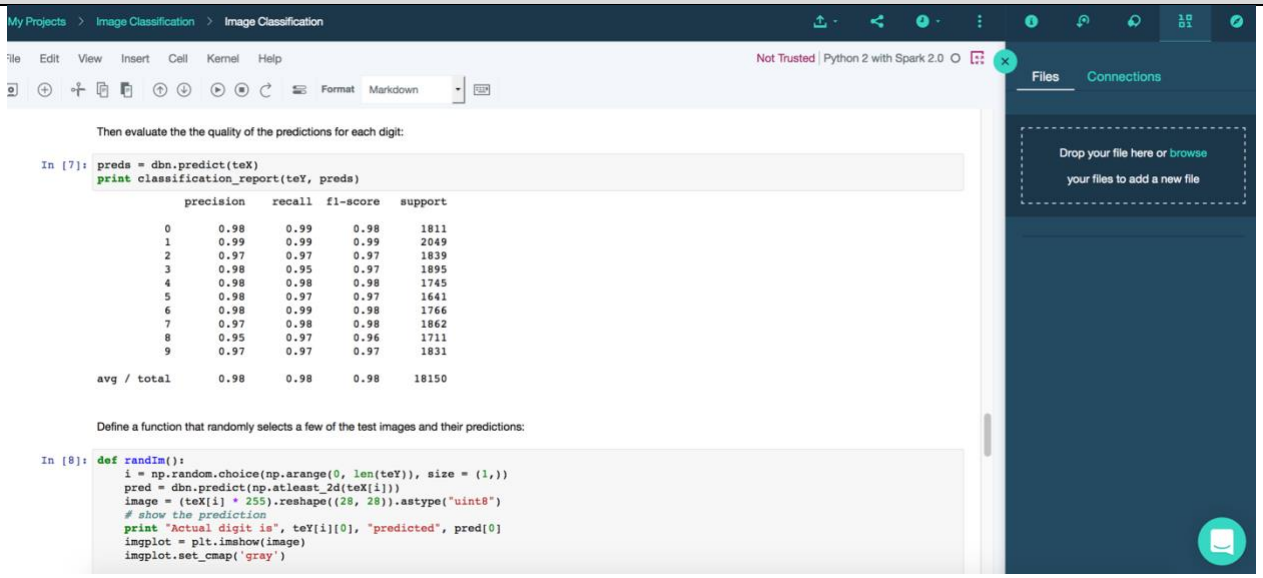
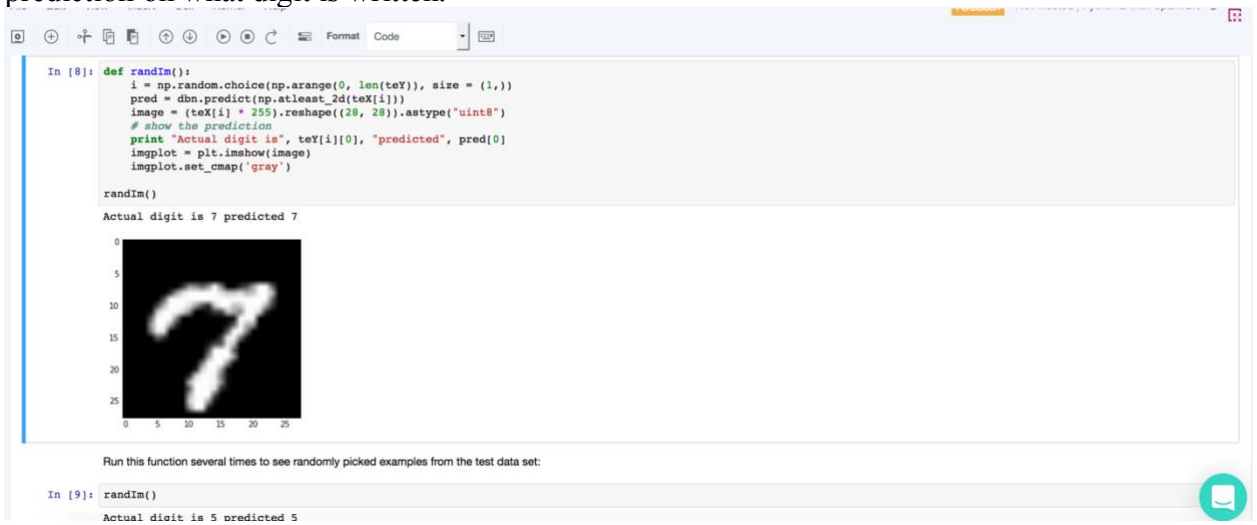
Step	Action
	

Run cell 5



Run cell 6

Step	Action
	  *Run cell 7*

Step	Action
	 Run the rest of the cells one by one. These will randomly select an image from MNIST, run it through prediction on what digit is written. 
4	**Conclusion** Now that you have successfully completed this lab, you should be able to: • Navigate IBM Data Science Experience • Create and use deep belief networks • Have familiarity with Cloud Services

Step	Action
5