

Data Science Workshop

An Experiential Journey with Data to Inspire *Your* Work

(Prewrite: Setup Instructions)

Maureen Norton

Neeraj Madan

Upkar Lidder

July 22nd and 23rd, 2020

Agenda

1. [Predictive Analytics and Machine Learning Solutions](#)
2. Overview of [Watson Studio](#) and [Watson Machine Learning](#)
3. Setup an Environment
 - Registration ([Create an account](#))
 - Setup an Environment ([Watson Studio](#), [Watson Machine Learning](#), [Cloud Object Storage](#))
4. [Create a Project](#)

Predictive Analytics and Machine Learning Solutions

Paragraph to summarize this slide to be updated

To name a few:

1. IBM Watson Studio
2. SAS Advanced Analytics
3. RapidMiner
4. Amazon SageMaker
5. Azure Machine Learning Studio (Microsoft)
6. Google Cloud AI Platform

“The Forrester Wave™: Multimodal Predictive Analytics And Machine Learning Solutions, Q3 2018”, Forrester Research, September 2018

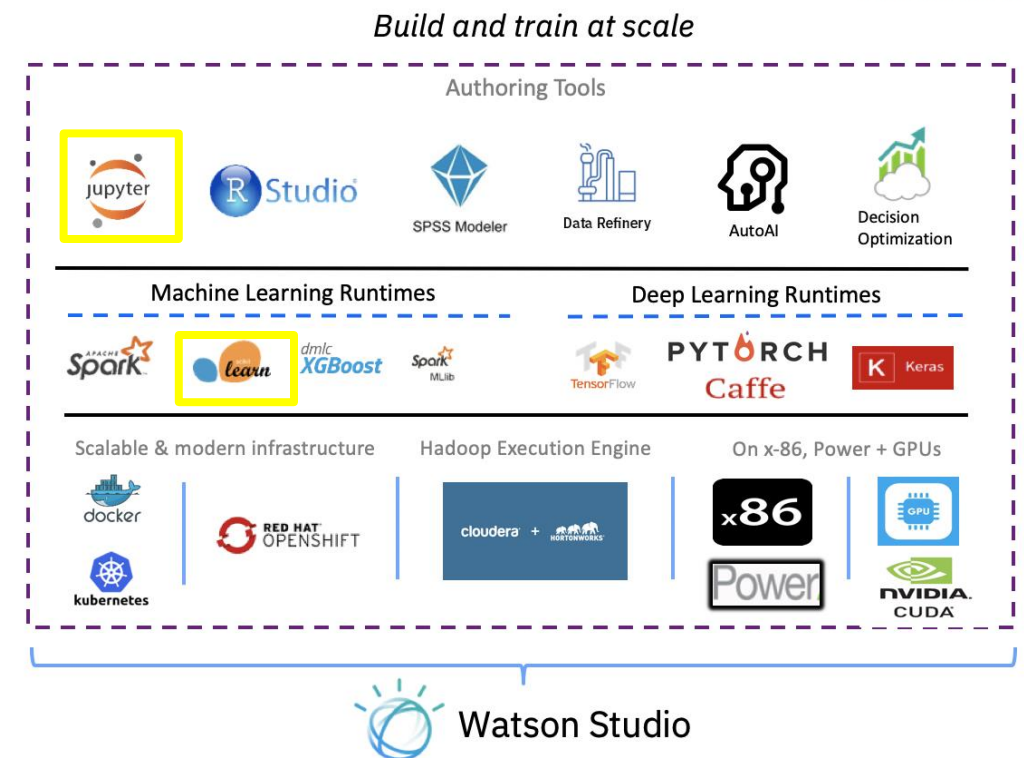
IBM Watson Studio Overview (1 of 4)

(Enterprise Data Science platform that helps your team work together to build models to make better data driven decisions for your business)

Analyze any data, no matter where it lives

Empower your entire organization with notebooks, visual productivity, and automation tools

One platform to rule them all from discovery to production



IBM Watson Studio Overview (2 of 4)

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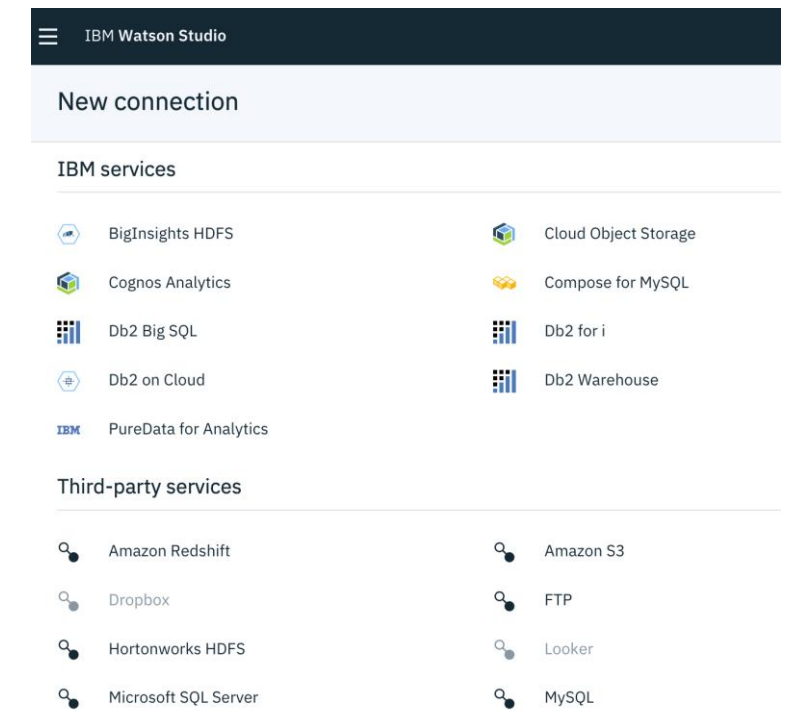
Connect to and analyze your data without moving a single byte through dozens of connectors and multiple deployment options.

Empower your entire organization with notebooks, visual productivity, and automation tools

Leverage your entire organization with a variety of tools in a single integrated platform.

One platform to rule them all from discovery to production

Analyze data, build predictive models, and seamlessly integrate Watson Machine Learning to deploy at scale



IBM Services like Cognos & DB2

3rd Party Services like Amazon S3, Hadoop, & Microsoft SQL Server

We have Public Cloud, Private Cloud, & Desktop/Server deployment options

IBM Watson Studio Overview (3 of 4)

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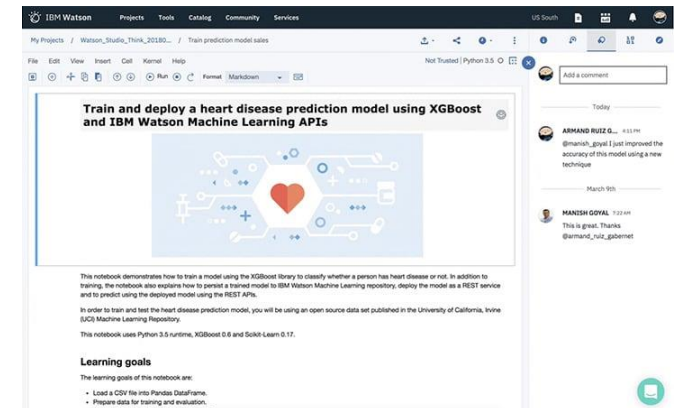
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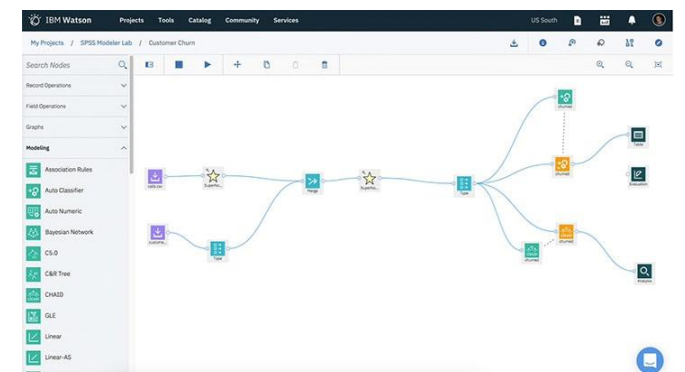
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Super charged Jupyter Notebooks & R Studio as most popular IDEs for data scientists well integrated with data connectors and rich set of default environments



Visual tools such as SPSS Modeler, Data Refinery, & AutoAI for non coders to analyze data and build models

IBM Watson Studio Overview (4 of 4)

(Enterprise Data Science platform that helps your team work together to build models to make better data driven decisions for your business)

Analyze any data, no matter where it lives

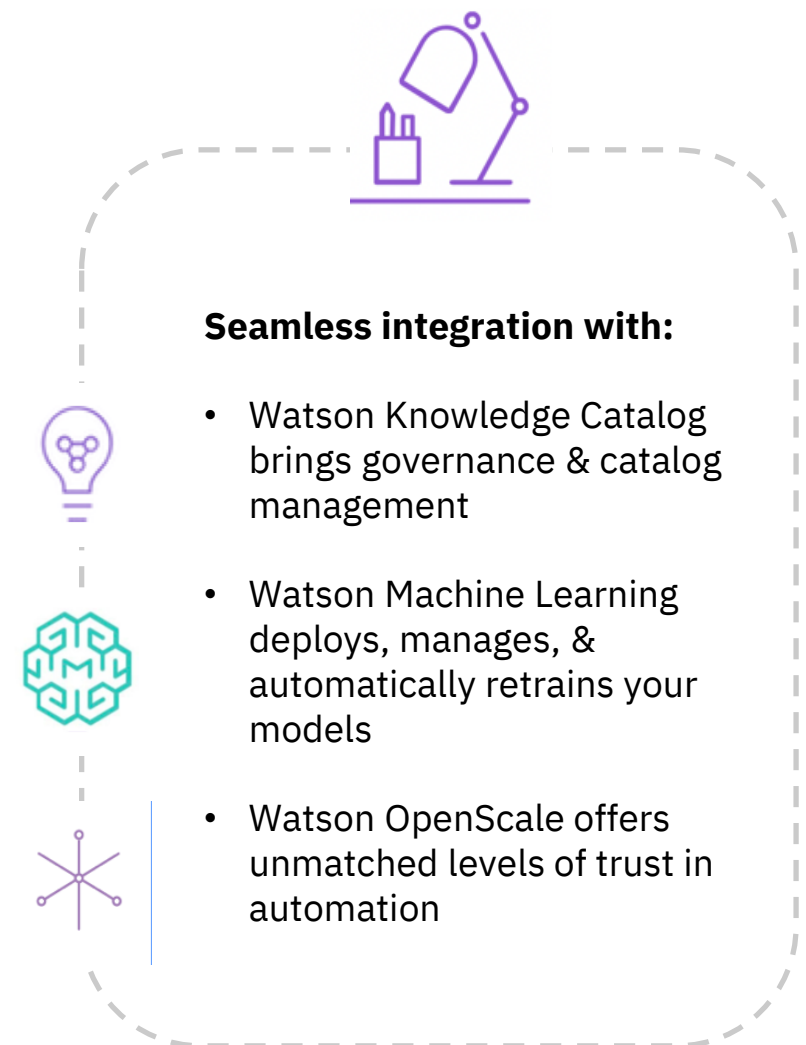
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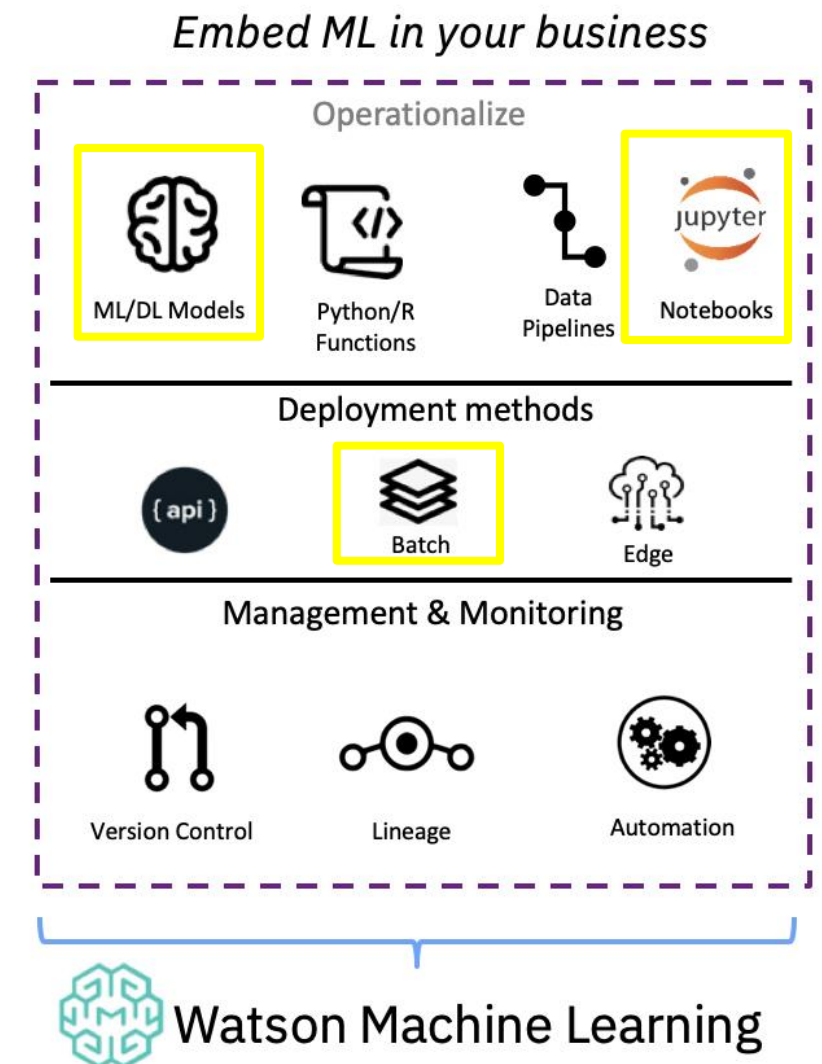
IBM Watson Machine Learning Overview (1 of 4)

(Embed Machine Learning and Deep Learning in your Business)

Deploy and Manage Models

Intelligent Model Operations

Accelerate Compute Intensive Workloads



IBM Watson Machine Learning Overview (2 of 4)

(Embed Machine Learning and Deep Learning in your Business)

Deploy and Manage Models

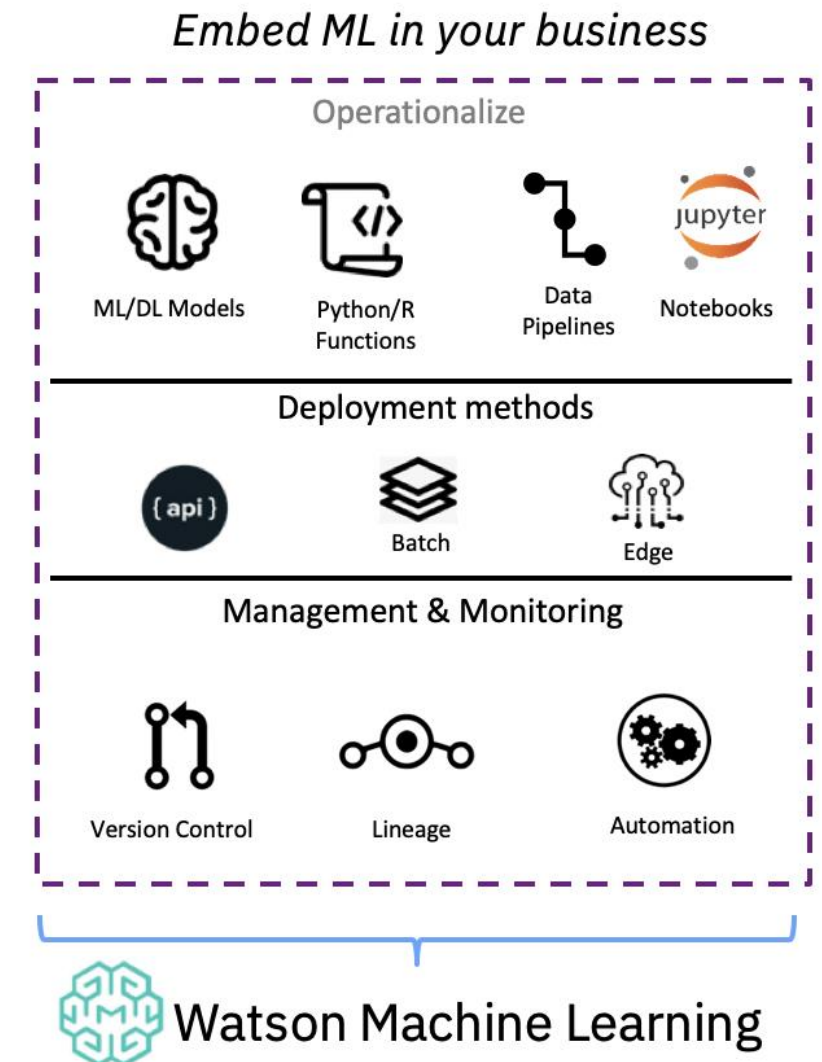
Move models to production, in an easy, secure, and compliant way.

Intelligent Model Operations

Embed intelligent training services, with feedback loops that constantly learn from new data, regardless where it resides.

Accelerate Compute Intensive Workloads

Distribute your deep learning training and Hadoop/Spark workloads with multi-tenant job scheduling .



IBM Watson Machine Learning Overview (3 of 4)

(Embed Machine Learning and Deep Learning in your Business)

Deploy and Manage Models

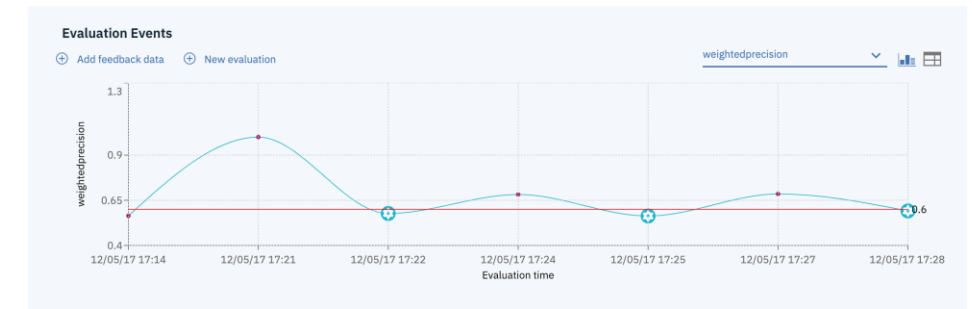
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Intelligent Model Operations

Embed intelligent training services, with feedback loops that constantly learn from new data, regardless where it resides.

Accelerate Compute Intensive Workloads

Distribute your deep learning training and Hadoop/Spark workloads with multi-tenant job scheduling .



- **Configure learning systems**
- **Flexible management experience**
 - User Interface
 - CLI
 - APIs
 - Python SDK

IBM Watson Machine Learning Overview (4 of 4)

(Embed Machine Learning and Deep Learning in your Business)

Deploy and Manage Models

Move models to production, in an easy, secure, and compliant way.

Intelligent Model Operations

Embed intelligent training services, with feedback loops that constantly learn from new data, regardless where it resides.

Accelerate Compute Intensive Workloads

Distribute your deep learning training and Hadoop/Spark workloads with multi-tenant job scheduling .



- **Visually monitor training jobs**
 - Experiments
 - AutoAI
- **WML Accelerator for optimized Spark and GPU jobs**
- **Integration with Hadoop for in-place batch training and scoring**

Getting Started: Setup an Environment

Registration (Sign up / Log into [IBM Cloud](#)) (1 of 3)

Already have an IBM Cloud account? [Log in](#)

Create a free account

Join us in the cloud and start building today.

Email

Enter your email id STEP A

Enter an email address.

First Name

Last Name

Country or Region

United States

Password

IBM may use my contact data to keep me informed of products, services and offerings:

☒ by email. ☒ by telephone.

You can withdraw your marketing consent at any time by sending an email to netstupp@us.ibm.com. Also you may unsubscribe from receiving marketing emails by clicking the unsubscribe link in each such email.

More information on our processing can be found in the [IBM Privacy Statement](#). By submitting this form, I acknowledge that I have read and understand the IBM Privacy Statement.

I accept the product [Terms and Conditions](#) of this registration form.

Create Account

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Already have an IBM Cloud account? [Log in](#)

Create a free account

Join us in the cloud and start building today.

Email

nmadan@us.ibm.com

STEP B

First Name

Neeraj

Last Name

Madan

Country or Region

United States

Password

IBM may use my contact data to keep me informed of products, services and offerings:

☒ by email. ☒ by telephone.

You can withdraw your marketing consent at any time by sending an email to netstupp@us.ibm.com. Also you may unsubscribe from receiving marketing emails by clicking the unsubscribe link in each such email.

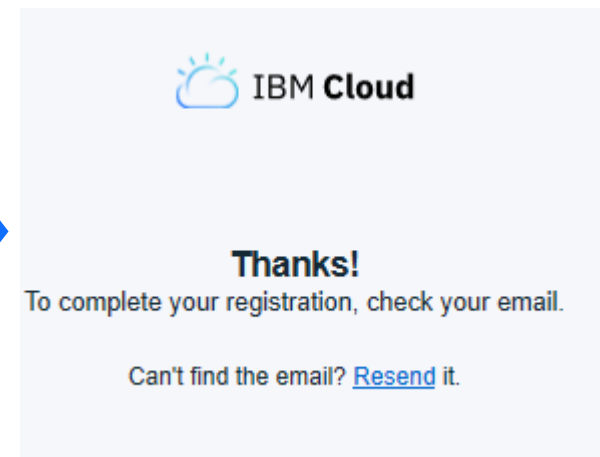
More information on our processing can be found in the [IBM Privacy Statement](#). By submitting this form, I acknowledge that I have read and understand the IBM Privacy Statement.

I accept the product [Terms and Conditions](#) of this registration form.

Create Account

STEP C

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Note: Incase you already have an IBM Cloud account, go to Verify Services and Storage. If any Service or Cloud Object Storage is missing, follow the respective section.

Getting Started: Setup an Environment

Registration [Confirm your account (Email verification)] (2 of 3)

Action required: Confirm your IBM Cloud account



Hello Neeraj,

Thank you for signing up for IBM Cloud! Confirm your account to get started.

Confirm account



STEP D

By confirming your account, you accept the [Terms of Use](#).

Welcome and happy building!

Thank you,
IBM Cloud

Visit the [IBM Cloud console](#).

© Copyright IBM Corporation 2014, 2020.

IBM



Welcome!

You confirmed your IBM Cloud account, and it is now activated. Log in to get started.

Log in



STEP E



About your IBMid Account Privacy

This notice provides information about accessing your IBMid user account (Account). If you have previously been presented with a version of this notice, please refer to "Changes since the previous version of this notice" below for information about the new updates.

+ [Changes since the previous version of this notice](#)

+ What data does IBM collect?

+ Why IBM needs your data

+ How your data was obtained

+ How IBM uses your data

+ How IBM protects your data

+ How long we keep your data

Your rights

Our [Privacy Statement](#) provides more information about your personal data rights. It also provides contact information if you have questions or concerns regarding our handling of your personal data.

Acknowledgement

I acknowledge that I understand how IBM is using my Basic Personal Data and I am at least 16 years of age.

Proceed

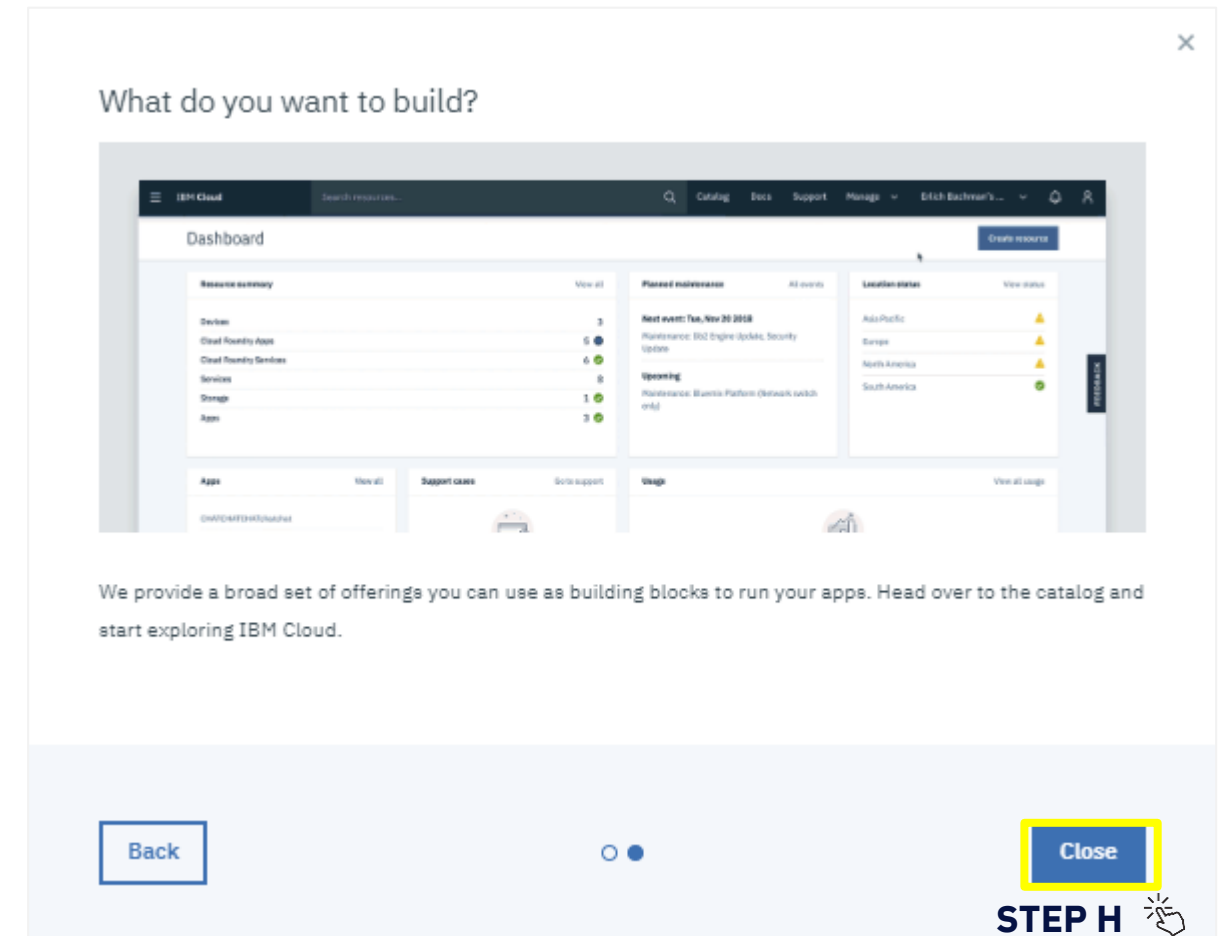
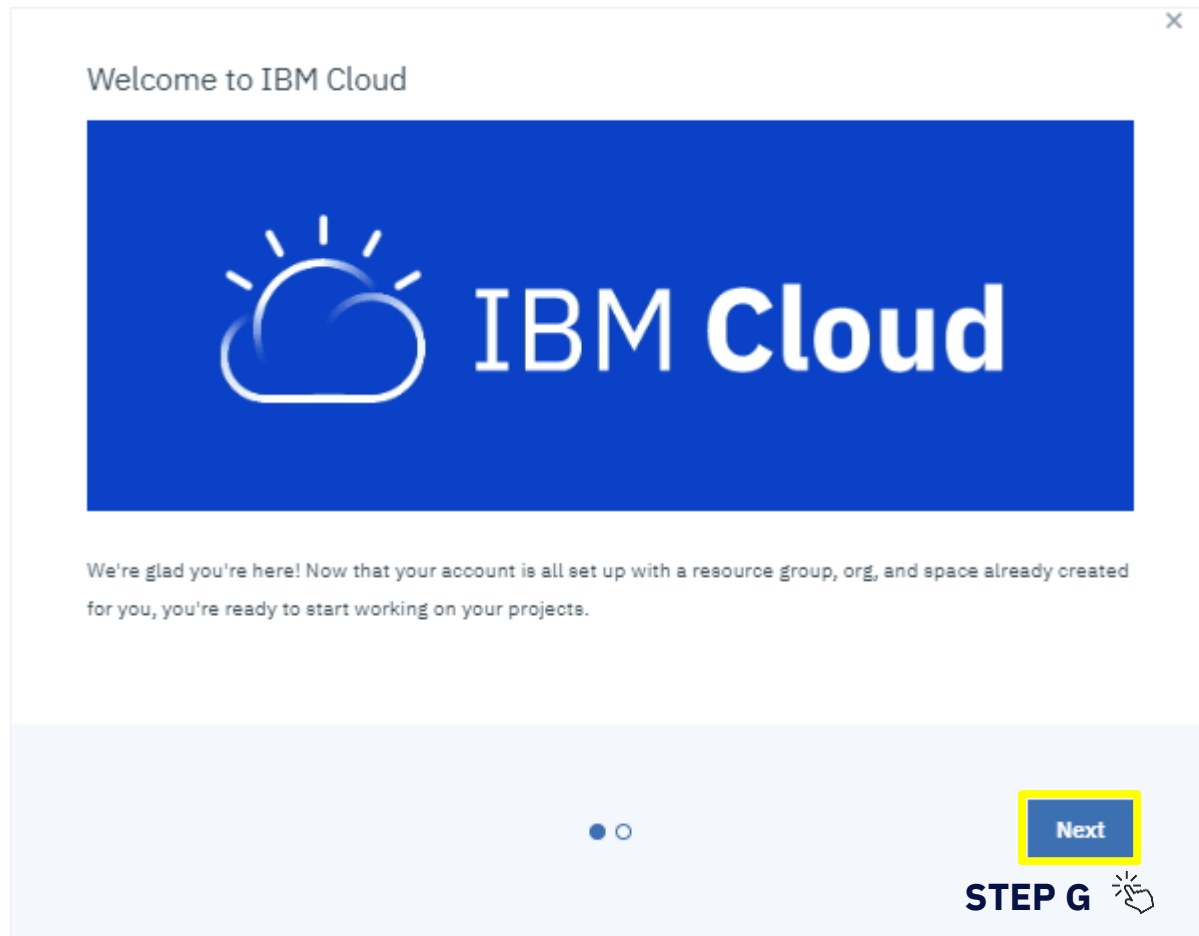
Cancel Sign In

STEP F



This document was last updated on 2018-05-04

Getting Started: Setup an Environment Registration (Welcome to IBM Cloud) (3 of 3)



Getting Started: Setup an Environment

Watson Studio Service (1 of 2)

The screenshot displays the IBM Cloud Catalog interface. At the top, the 'Catalog' tab is highlighted in the navigation bar. Below the navigation bar, a blue banner contains the text: 'Try the best of the Catalog for free with no time restrictions with Lite plans. The Lite filter is enabled. Remove the filter to see the full Catalog.' To the right of this banner is a yellow box labeled 'STEP A' with a hand icon pointing to the 'Catalog' tab.

Below the banner, the 'Catalog' section is shown. A search bar contains the text 'watson studio' and is highlighted with a yellow box labeled 'STEP B' with a hand icon pointing to the search bar. Below the search bar, the 'Services (2)' tab is selected, and the 'Software (0)' tab is also visible. On the left side, a list of categories is shown, with 'AI (1)' highlighted by a yellow box.

In the main content area, the 'Services' section is displayed. It includes a description: 'Explore our broad portfolio of managed services for infrastructure, developer tools, and more to build your apps on the public cloud.' Below this, there are filters: 'Filters: Lite x Clear all'. The 'AI' category is selected, and a card for 'Watson Studio' by IBM is highlighted with a yellow box labeled 'STEP C' with a hand icon pointing to the card. The card text reads: 'Embed AI and machine learning into your business. Create custom models using your own data.' Below the card, the category 'AI' is listed.

Getting Started: Setup an Environment

Watson Studio Service (2 of 2)

IBM Cloud

Watson Studio Lite IBM Service IAM-enabled

Author: IBM • Date of last update: 01/13/2020

Need Help? [Contact Support](#) [View docs](#)

Create About

Select a region

Dallas

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: [United States](#)

PLAN	FEATURES	PRICING
✓ Lite	1 authorized user 60 capacity unit-hours monthly limit 1 free small compute environment with 1 vCPU and 4 GB RAM (does not require capacity unit-hours)	Free

The Lite plan for Watson Studio offers everything you need to become a better data scientist or domain expert in a collaborative environment.

Lite plan services are deleted after 30 days of inactivity.

Summary

Watson Studio Free

Region: Dallas

Plan: Lite

Service name: Watson Studio-79

Resource group: Default

STEP E

Create

Add to estimate

[View terms](#)

STEP D

FEEDBACK

Getting Started: Setup an Environment

Watson Machine Learning (1 of 3)

The screenshot displays the IBM Cloud Catalog interface. At the top, a navigation bar includes the IBM Cloud logo, a menu icon, and tabs for 'STEP A', 'Catalog', 'Docs', 'Support', 'Manage', and a user profile icon. The 'Catalog' tab is highlighted. Below the navigation bar, a search bar contains the text 'watson machine'. To the right of the search bar, a lightbulb icon is labeled 'STEP B'. Below the search bar, there are two tabs: 'Services (1)' and 'Software (0)'. The 'Services (1)' tab is selected. On the left side, a sidebar lists various categories: 'All Categories (1)', 'VPC Infrastructure', 'Compute', 'Containers', 'Networking', 'Storage', 'AI (1)', 'Analytics', 'Databases', 'Developer Tools', 'Integration', 'Internet of Things', 'Security and Identity', 'Web and Mobile', and 'Web and Application'. The 'All Categories (1)' link is highlighted. The main content area is titled 'Services' and contains a description: 'Explore our broad portfolio of managed services for infrastructure, developer tools, and more to build your apps on the public cloud.' Below this, there are filters: 'Free' (with an 'x' icon) and 'Clear all'. A section titled 'All Categories' is visible. A card for 'Machine Learning' is highlighted with a yellow box. The card includes the IBM logo, the text 'Machine Learning', 'IBM • AI', a description: 'IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.', and tags: 'Lite • Free • IAM-enabled'. To the right of the card, a lightbulb icon is labeled 'STEP C'. On the far right, a vertical 'FEEDBACK' button is visible.

IBM Cloud

STEP A Catalog Docs Support Manage 1704755 ...

Catalog watson machine x

STEP B

Services (1) Software (0)

All Categories (1) >

VPC Infrastructure

Compute

Containers

Networking

Storage

AI (1)

Analytics

Databases

Developer Tools

Integration

Internet of Things

Security and Identity

Web and Mobile

Web and Application

Services

Explore our broad portfolio of managed services for infrastructure, developer tools, and more to build your apps on the public cloud.

Filters: Free x Clear all

All Categories

Machine Learning

IBM • AI

IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.

Lite • Free • IAM-enabled

STEP C

FEEDBACK

Getting Started: Setup an Environment

Watson Machine Learning (2 of 3)

IBM Watson Studio

Upgrade

Neeraj Madan's Account

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Machine Learning

IBM Watson Machine Learning is a full-service IBM Cloud offering that makes it easy for developers and data scientists to work together to integrate predictive capabilities with their applications. The Machine Learning service is a set of REST APIs that you can call from any programming language to develop applications that make smarter decisions, solve tough problems, and improve user outcomes.

Features

Machine Learning features

Take advantage of machine learning models management (continuous learning system) and deployment (online, batch, streaming). Select any of widely supported machine learning frameworks: TensorFlow, Keras, Caffe, PyTorch, Spark MLlib, scikit learn, xgboost and SPSS.

Wide choice of interfaces

Use the command line interface and Python client to manage your artifacts. Extend your application with artificial intelligence through the Watson Machine Learning REST API.

Integration with Watson Studio

Create and train machine learning models with the best tools and the latest expertise in a social environment built by and for data scientists.

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

PLAN	FEATURES	PRICING
<div>Lite</div>	<div>Service instance</div> <div>5 model deployments</div> <div>5,000 predictions</div> <div>50 capacity unit-hours (CUH) included:</div> <div>Capacity Type:</div> <div><ul style="list-style-type: none">1 (one) NVIDIA K80 GPU = 2 capacity units required per hour1 (one) NVIDIA V100 GPU = 8 capacity units required per hour1 vCPU and 4 GB RAM = 0.5 capacity units required per hour2 vCPU and 8 GB RAM = 1 capacity units required per hour4 vCPU and 16 GB RAM = 2 capacity units required per hour8 vCPU and 32 GB RAM = 4 capacity units required per hour16 vCPU and 64 GB RAM = 8 capacity units required per hour</div> <div>Auto AI</div> <div>8 vCPU and 32 GB RAM = 20 capacity units required per hour</div> <div>Decision Optimization</div> <div>2 vCPU and 8 GB RAM = 30 capacity units required per hour</div> <div>4 vCPU and 16 GB RAM = 40 capacity units required per hour</div> <div>16 vCPU and 64 GB RAM = 60 capacity units required per hour</div>	Free

The lite plan instance of the IBM Watson Machine Learning service provides you with a maximum of 5 deployed models, 5,000 predictions per month, and 50 capacity unit-hours per month during which model can be trained, evaluated, and deployed to be available to accept prediction events, with a minimum of 1 minute per training job.



Confirm Creation

Region

Dallas

Plan

Lite

Resource group

Default

Service name

pm-20-uu

Cancel

Confirm

Create

STEP D

STEP E



Getting Started: Setup an Environment

Watson Machine Learning (3 of 3)

IBM Cloud

Search resources and offerings...

Catalog Docs Support Manage Neeraj Madan's Account

Manage

Service credentials

Resource list /

Machine Learning-d3

Resource group: Default Location: Dallas Add tags

Service credentials

Credentials are provided in JSON format. The JSON snippet lists credentials, such as the API key and secret, as well as connection information for the service. [Learn more](#)

Service credentials

New credential

Click New credentials to create a set of credentials for this instance

STEP A

STEP B



Add new credential

Name:

Service credentials-1

Role: ①

Writer

Select Service ID (Optional) ①

Auto Generate

STEP C

Select a valid JSON object to upload

Choose file

Cancel Add

STEP D



Service credentials-1

JAN 28, 2020 - 05:45:09 AM

View credentials

STEP E

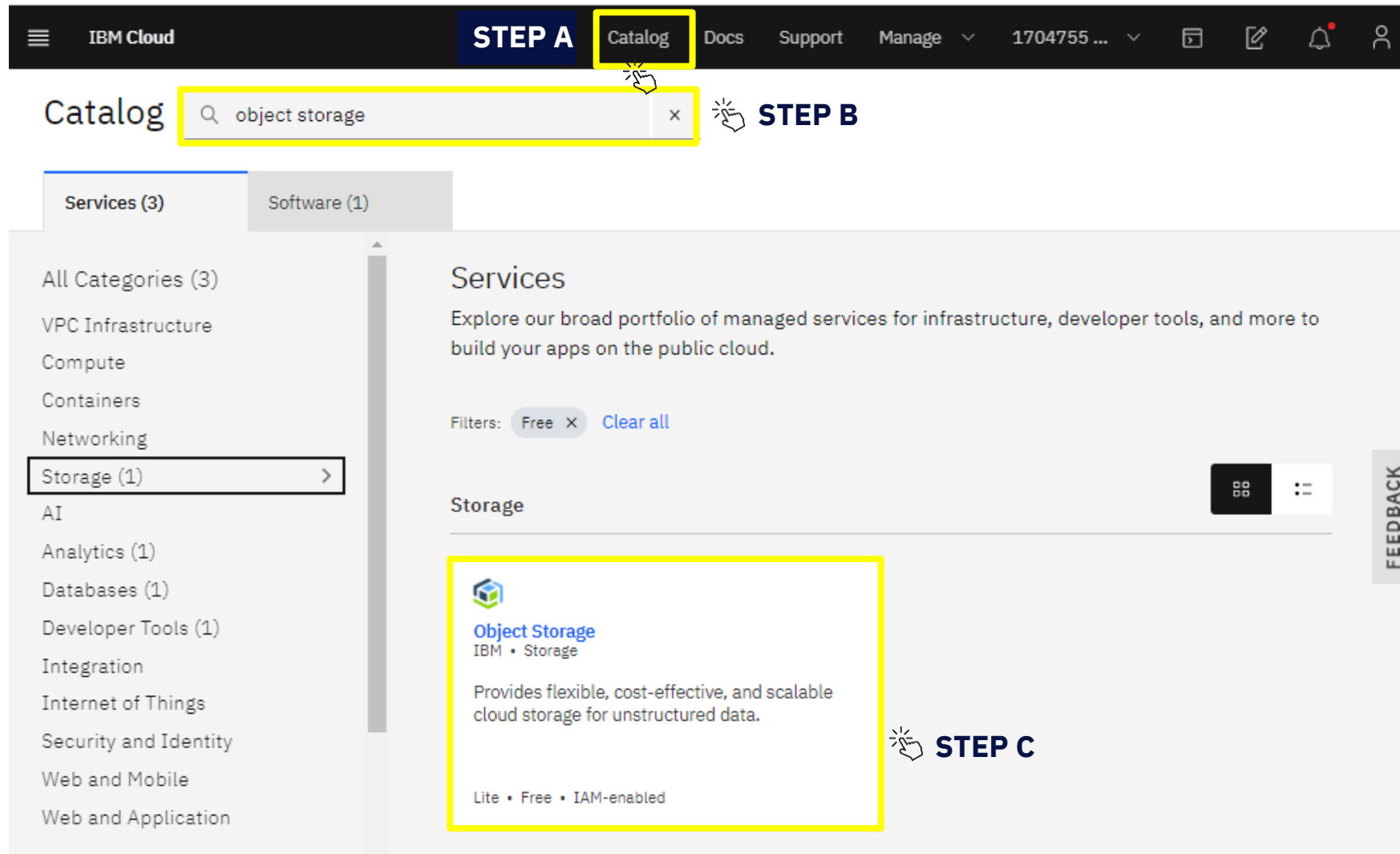
```
{
  "apikey": "",
  "iam_apikey_description": "Auto-generated for key ",
  "iam_apikey_name": "Service credentials-1",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Writer",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity::",
  "instance_id": "",
  "url": "https://us-south.ml.cloud.ibm.com"
}
```

STEP F

Keep these credentials (apikey and instance_id) handy as we are going to use them while running the project notebook

Getting Started: Setup an Environment

Cloud Object Storage (1 of 2)



Getting Started: Setup an Environment

Cloud Object Storage (2 of 2)

IBM Watson Studio

Upgrade

Neeraj Madan's Account

NM

Existing

New

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 Cloud Platform as well as IBM Watson services. IBM Cloud Object Storage is available with Regional, Cross Region and single site 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 is 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. Key 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	1 COS Service Instance Storage up to 25 GB/mo. Up to 20,000 GET requests/mo. Up to 2,000 PUT requests/mo. Up to Data Retrieval 10 GB/mo. Up to 5GB Public Outbound Applies to aggregate total across all storage bucket classes	Free
<input type="radio"/> Standard	There is no minimum fee, so you pay only for what you use.	Expand each section to view details

Cancel

Create



Confirm Creation

Plan

Lite

Resource group

Default

Service name

cloud-object-storage-qx

Cancel

Confirm

STEP D

STEP E



Getting Started: Setup an Environment

Verify Services and Storage

The image shows the IBM Cloud dashboard interface. On the left, a navigation menu highlights the 'Dashboard' option (labeled 'STEP A'). The main dashboard area shows a 'Resource summary' section with a 'View resources' link (labeled 'STEP B'). Below this, a table lists resources. The table has columns: Name, Group, Location, Offering, and Status. The resources listed are:

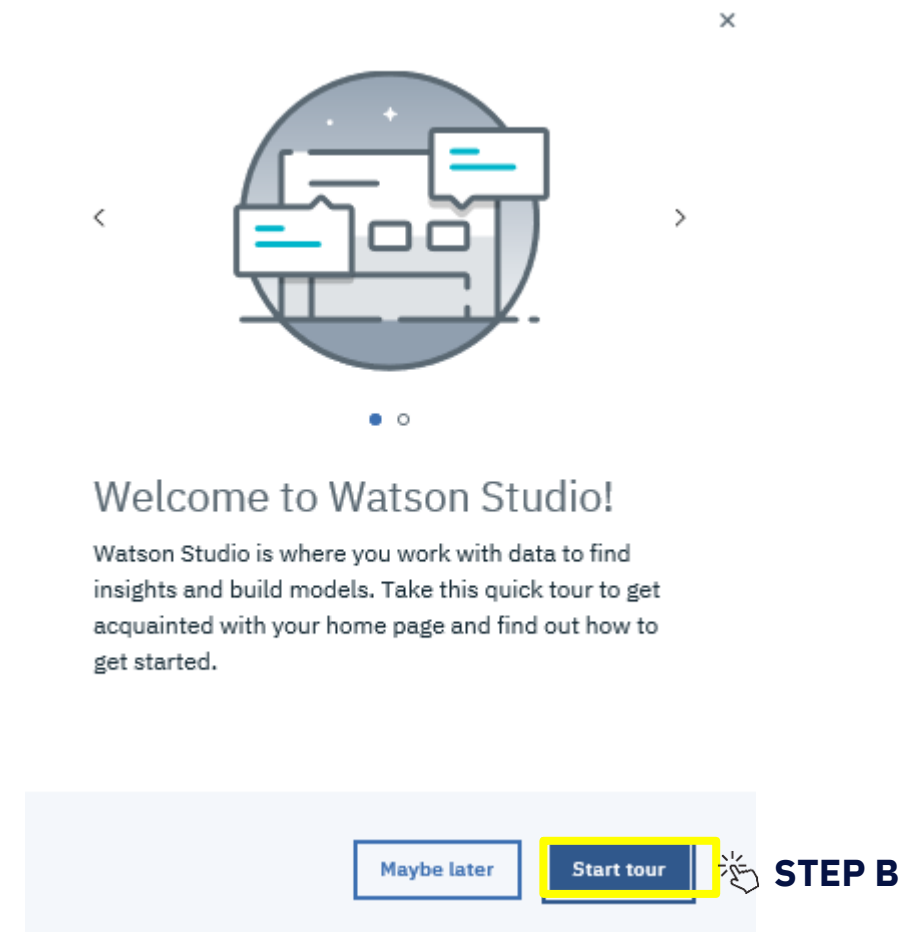
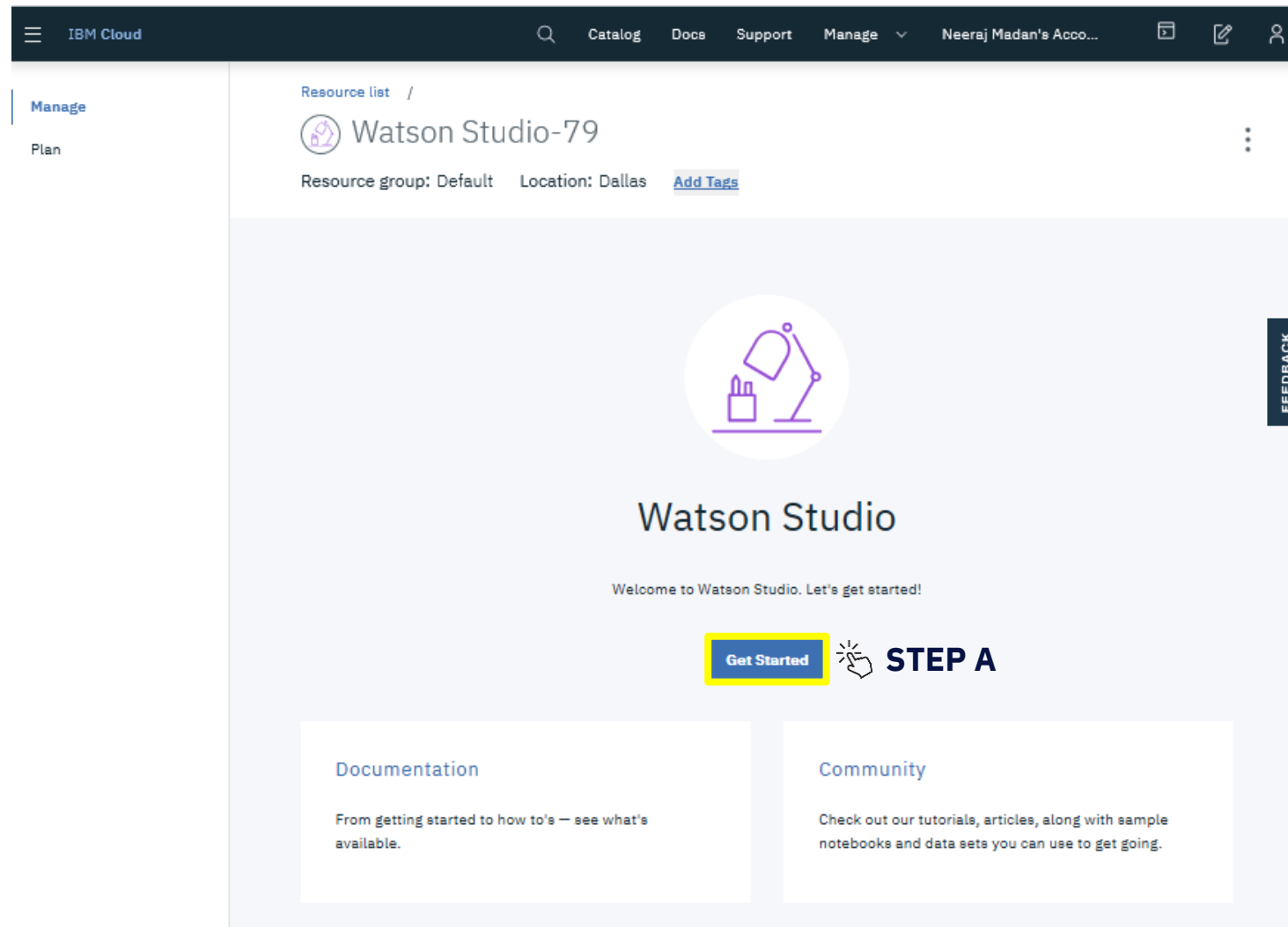
Name	Group	Location	Offering	Status
Services (2)				
Watson Studio-79		Dallas	Watson Studio	Active
pm-20-jx	Default	Dallas	Machine Learning	Active
Storage (1)				
cloud-object-storage-qx	Default	Global	Cloud Object Storage	Provisioned

The 'Watson Studio-79' resource is highlighted with a yellow box (labeled 'STEP D. Launch Watson Studio'). The 'cloud-object-storage-qx' resource is also highlighted with a yellow box. The 'View resources' link is highlighted with a yellow box (labeled 'STEP B'). The 'Add more resources' link is also visible.

STEP C
Services to show Watson Studio and Machine Learning Services.
Storage to show Cloud Object Storage.

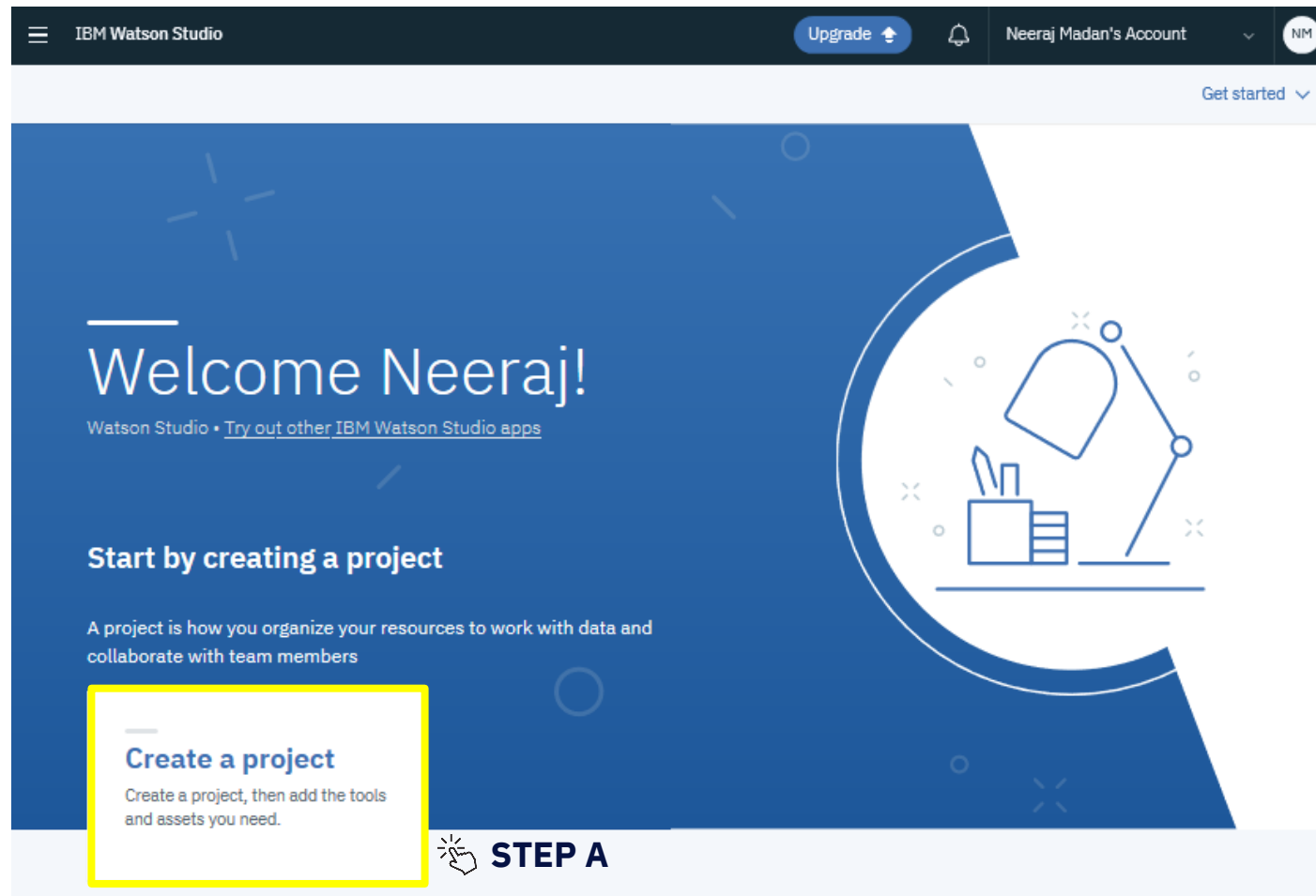
Getting Started: Create a Project

Launch Watson Studio



Getting Started: Create a Project

Select an Empty Project



IBM Watson Studio

Upgrade

Neeraj Madan's Account

Get started

Welcome Neeraj!

Watson Studio • [Try out other IBM Watson Studio apps](#)

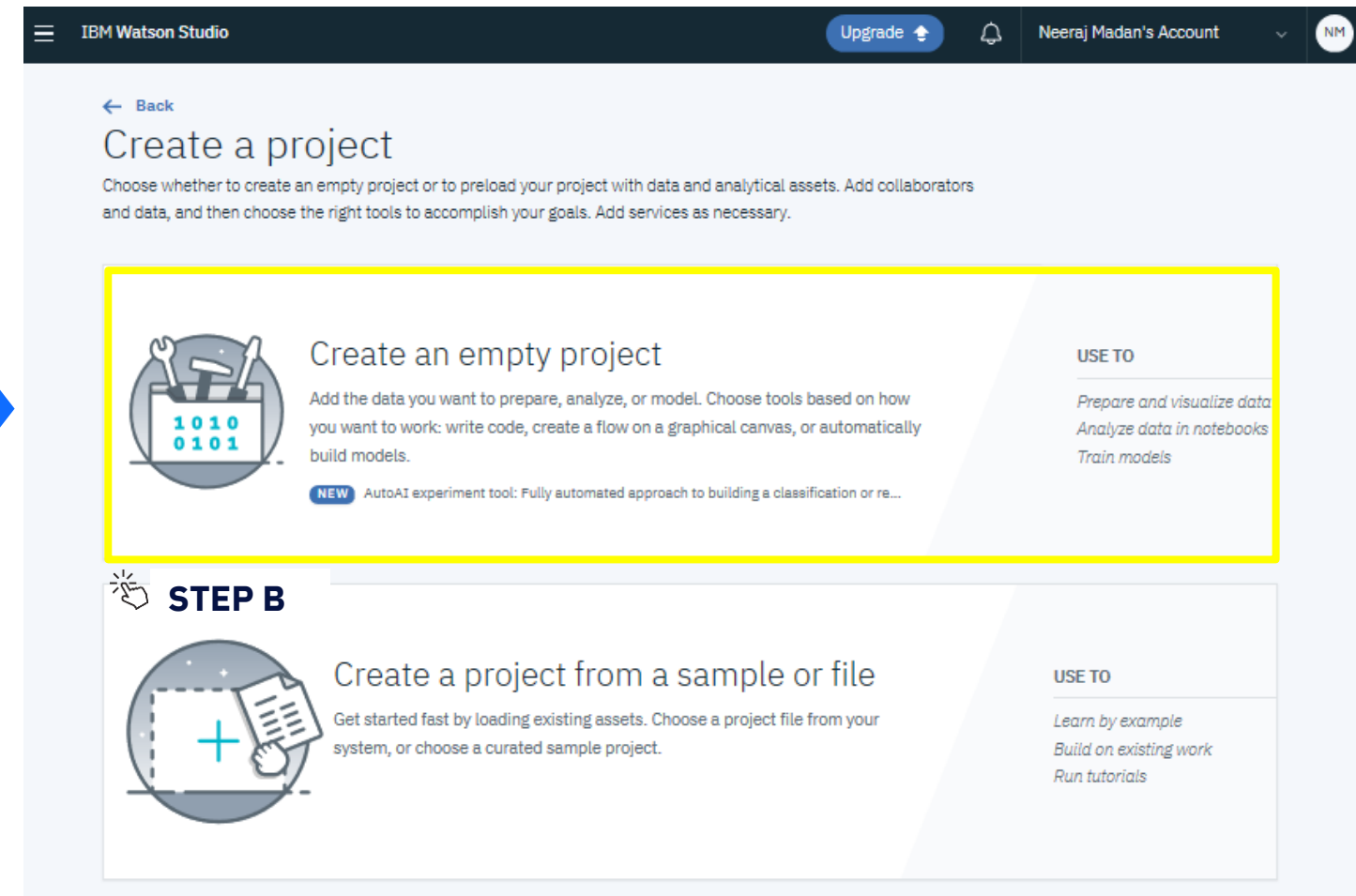
Start by creating a project

A project is how you organize your resources to work with data and collaborate with team members

Create a project

Create a project, then add the tools and assets you need.

STEP A



IBM Watson Studio


Upgrade

Neeraj Madan's Account

Back

Create a project

Choose whether to create an empty project or to preload your project with data and analytical assets. Add collaborators and data, and then choose the right tools to accomplish your goals. Add services as necessary.



Create an empty project


Add the data you want to prepare, analyze, or model. Choose tools based on how you want to work: write code, create a flow on a graphical canvas, or automatically build models.

NEW AutoAI experiment tool: Fully automated approach to building a classification or re...

USE TO

- Prepare and visualize data
- Analyze data in notebooks
- Train models

STEP B



Create a project from a sample or file


Get started fast by loading existing assets. Choose a project file from your system, or choose a curated sample project.


USE TO



- Learn by example
- Build on existing work
- Run tutorials

Getting Started: Create a Project

Mention the Project Name

 IBM Watson Studio

Upgrade 

 Neeraj Madan's Account 

NM

New project


Define project details

Storage

Name

cloud-object-storage-qx


Net Promoter Score Prediction

 **STEP A**

Description

Project description


Choose project options

☐ Restrict who can be a collaborator 


Project includes integration with [Cloud Object Storage](#) for storing project assets.


Cancel


Create

 **STEP B**










Gather your resources

Your project can contain many types of resources, but the most important are your team and your data. Add collaborators and data sets, and then create analytic assets like notebooks and models to work with your data.

Maybe later

Start tour

 **STEP C**

Getting Started: Create a Project

Generate a Project Token

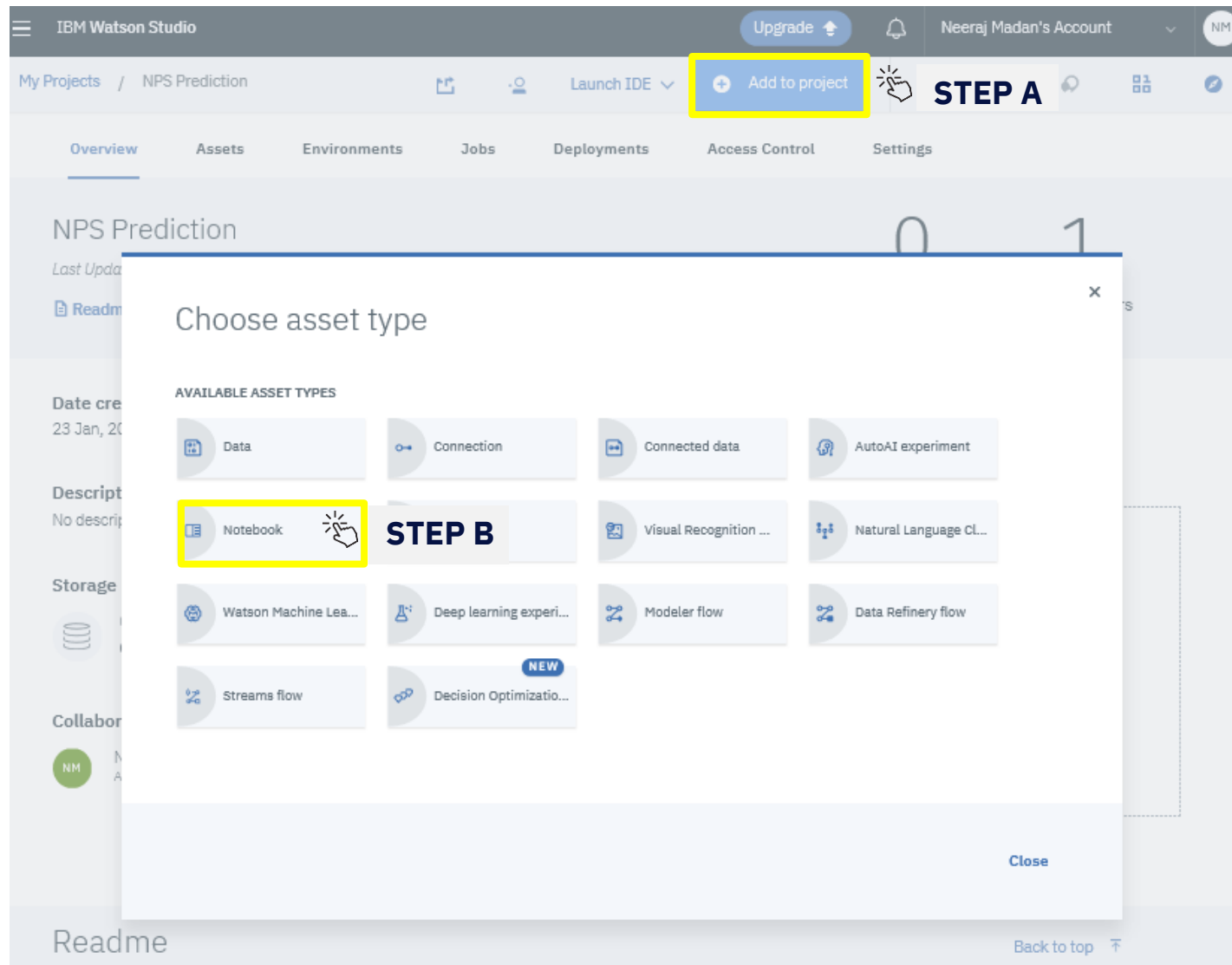
The screenshot illustrates the process of generating a project token in IBM Watson Studio. It is divided into four steps:

- STEP A:** The user is in the 'My Projects' view for a project named 'NPS Prediction'. The 'Settings' tab is selected in the top navigation bar.
- STEP B:** The 'Access tokens' section is shown. A 'New token' button with a plus icon is highlighted.
- STEP C:** The 'New Token' dialog box is open. The 'Name' field is highlighted and contains the placeholder text '<give any name>'. The 'Access role for project' dropdown is set to 'Editor'.
- STEP D:** The 'Create' button at the bottom right of the 'New Token' dialog is highlighted.

Blue arrows indicate the flow from Step A to Step B, and from Step B to Step C.

Getting Started: Create a Project

Add a notebook to your project



Getting Started: Create a Project

Import a notebook from GitHub

IBM Watson Studio

Upgrade

Neeraj Madan's Account

My Projects / NPS Prediction / Add Notebook

New notebook

Blank From file From URL

Name

NPS Prediction

26 characters remaining

Description (optional)

Type your Description here

500 characters remaining

Select runtime

Default Python 3.6 XS (2 vCPU 8 GB RAM)

The selected runtime has 1 vCPU and 4 GB RAM and is free.
[Learn more](#) about capacity unit hours and Watson Studio pricing plans.

Notebook URL

Use the notebook link mentioned below

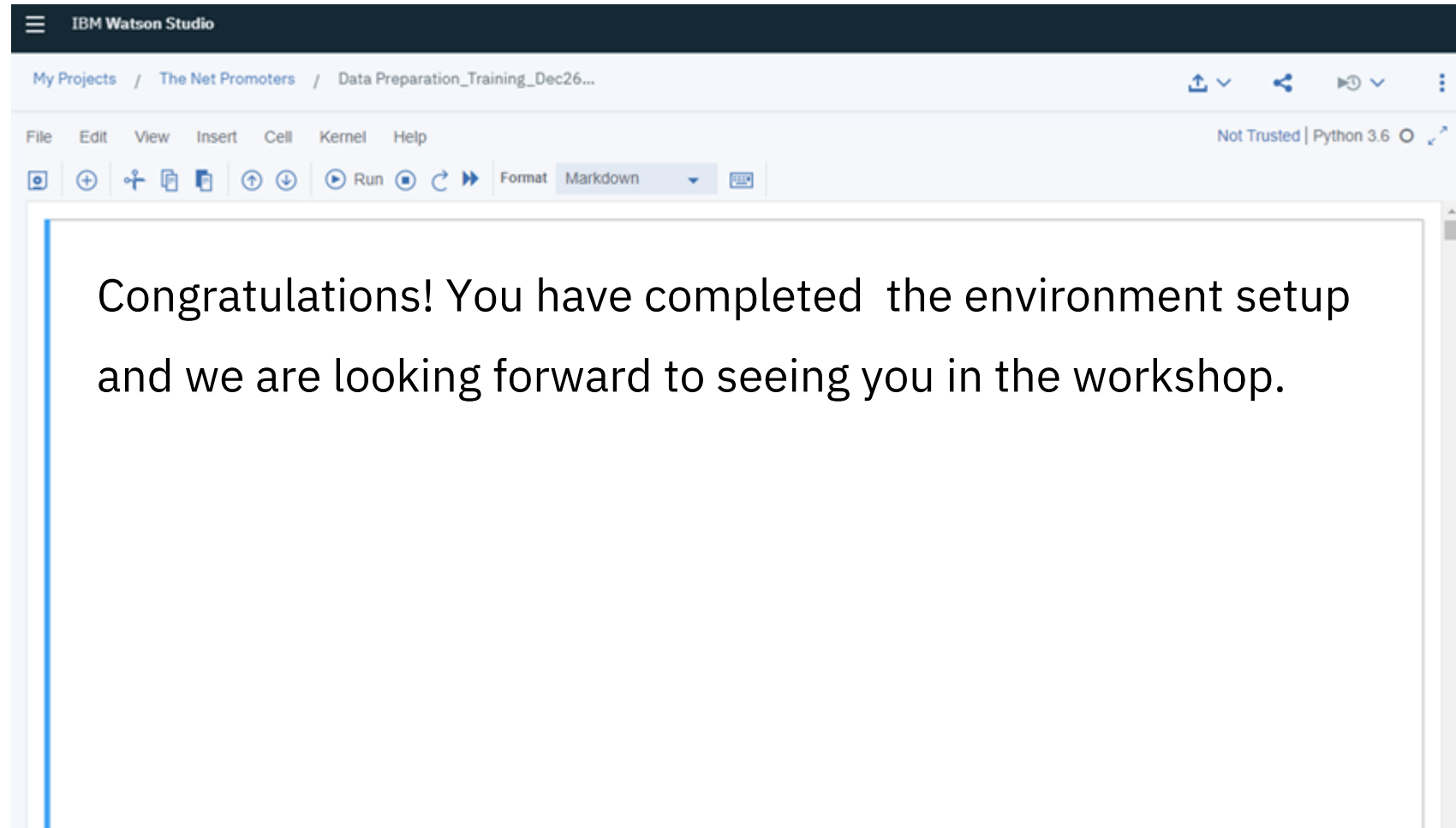
STEP A

STEP B




Notebook URL: <https://github.com/neemadan/An-Experiential-Journey-With-Data-to-Inspire-Your-Work/blob/master/Workshop%20Setup%20Instructions%20Notebook.ipynb>

Getting Started: Create a Project

Let's get started!



Contact Us

	<p>Name: Maureen Norton Email Id: nortonm@us.ibm.com LinkedIn: https://www.linkedin.com/in/maureennorton/</p>
	<p>Name: Upkar Lidder Email Id: ulidder@us.ibm.com LinkedIn: https://www.linkedin.com/in/lidderupk/</p>
	<p>Name: Neeraj Madan Email Id: nmadan@us.ibm.com LinkedIn: https://www.linkedin.com/in/neerajmadan/</p>

