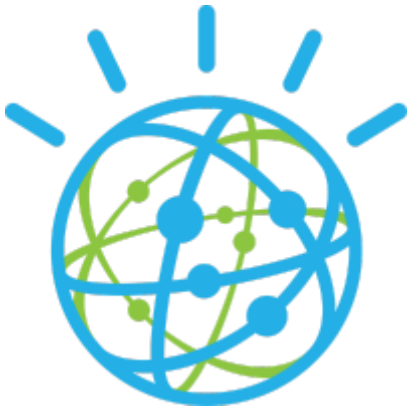
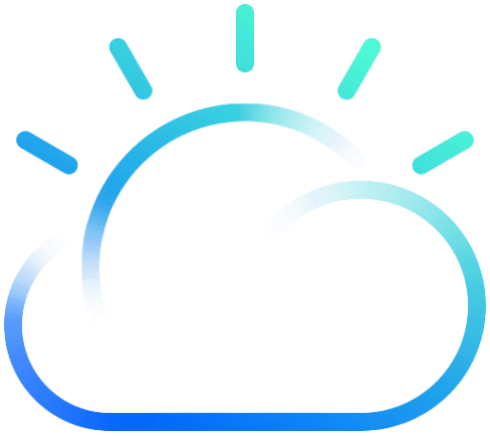
Hands-on Lab





Watson Studio

Decision Optimization

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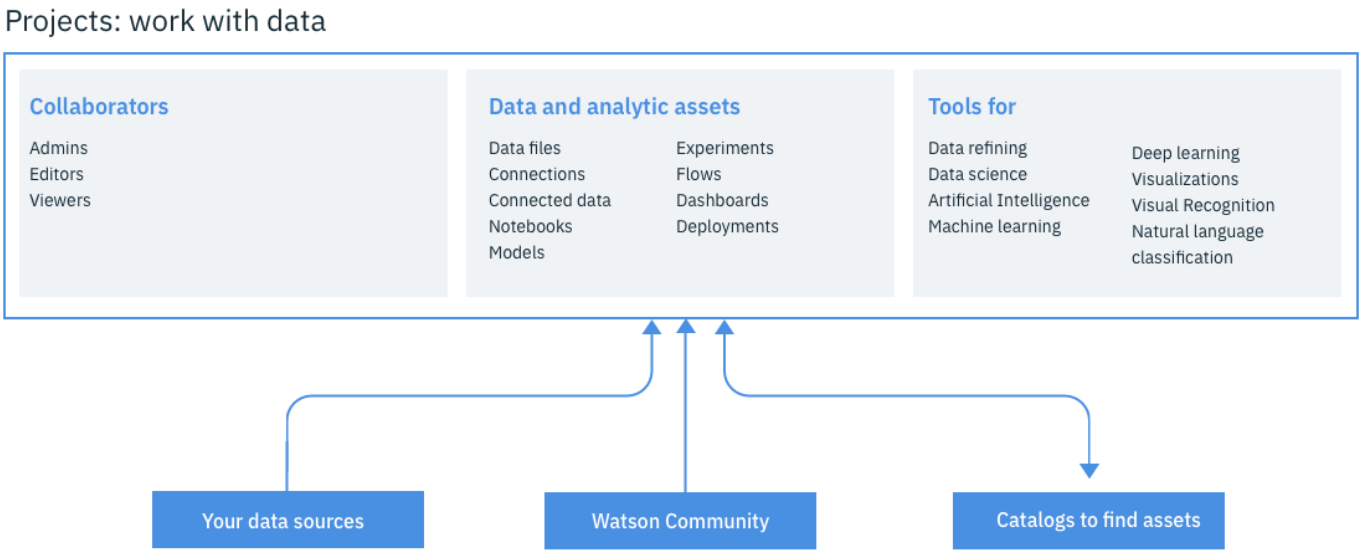
Introduction

Watson Studio provides you with the environment and tools to solve your business problems by collaboratively working with data. You can choose the tools you need to analyze and visualize data, to cleanse and shape data, to ingest streaming data, or to create, train, and deploy machine learning models.

This illustration shows how the architecture of Watson Studio is centered around the project. A project is where you organize your resources and work with data.



With the **Decision Optimization** service, you invoke optimization engines and develop applications to solve complex problems in planning, scheduling, resource management, and other operational areas. You describe a situation as an optimization model, using your data and criteria, and Decision Optimization identifies the best solution. The service is based on a sophisticated analytics technology, called Prescriptive Analytics.

Objective

In the following lab, you will learn:

- How to create a Watson Studio service in IBM Cloud
- How to create a Decision Optimization service in IBM Cloud
- How to import a Jupyter Notebook into a Watson Studio project and incorporate a Decision Optimization service to solve a business problem

Pre-Requisites

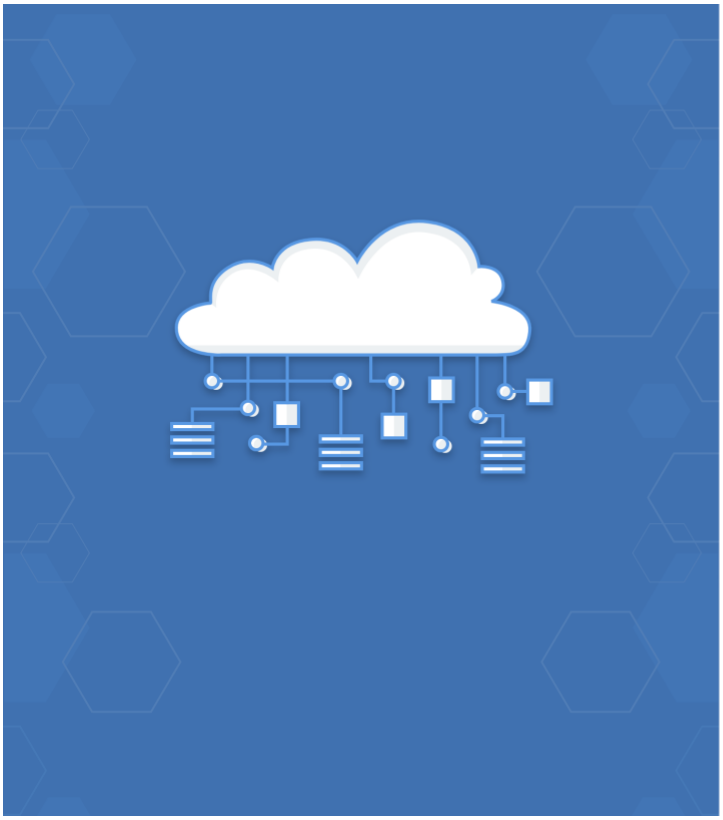
- An E-mail address to sign up for an IBM Cloud account or use an existing account

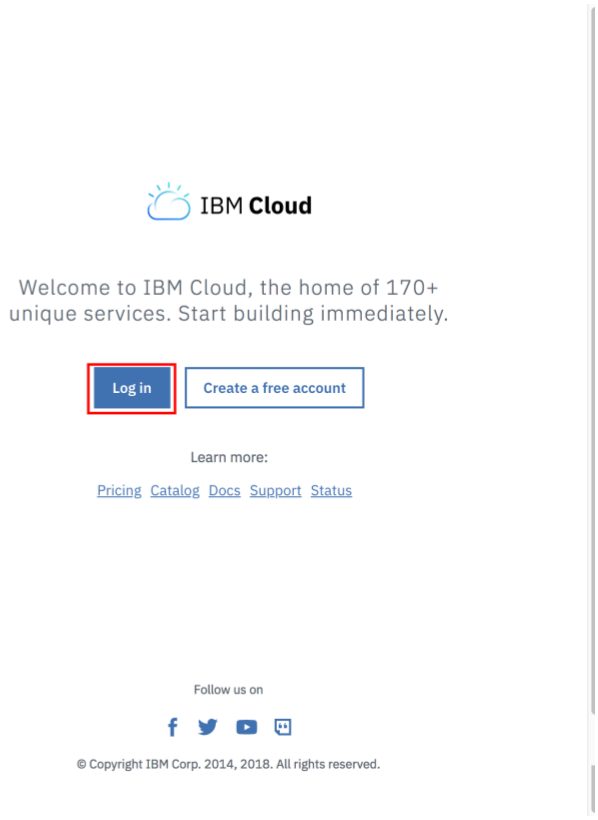
Steps

1. Log in to your IBM Cloud account
2. Create a Decision Optimization service
3. Create a Watson Studio service
4. Create a project in Watson Studio
5. Add an Apache Spark service
6. Copy a Jupyter Notebook
7. Incorporate the Decision Optimization service
8. Run the notebook to view results for a business problem
9. Next steps

Step 1: Log in to IBM Cloud

Log in to your IBM Cloud account: https://console.bluemix.net/

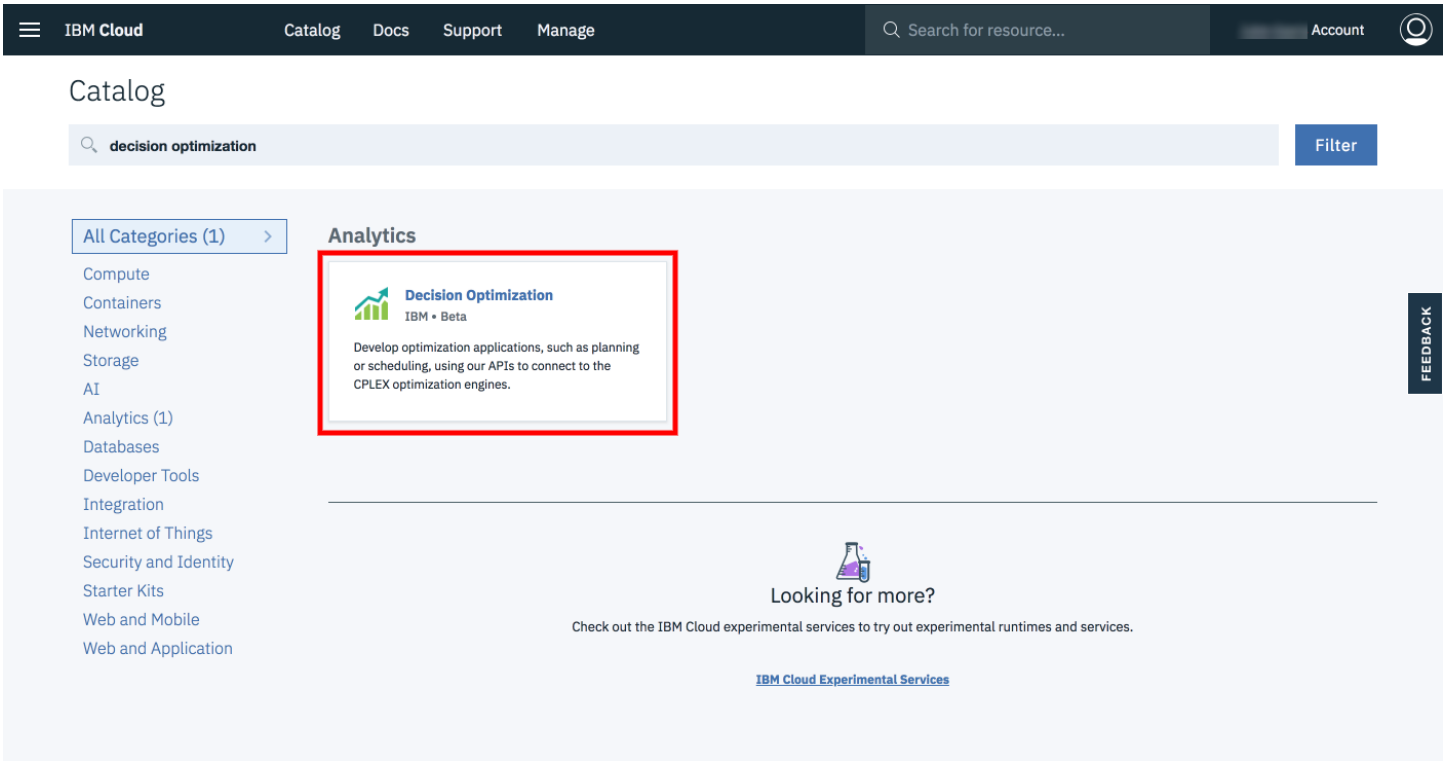




Step 2: Create a Decision Optimization service

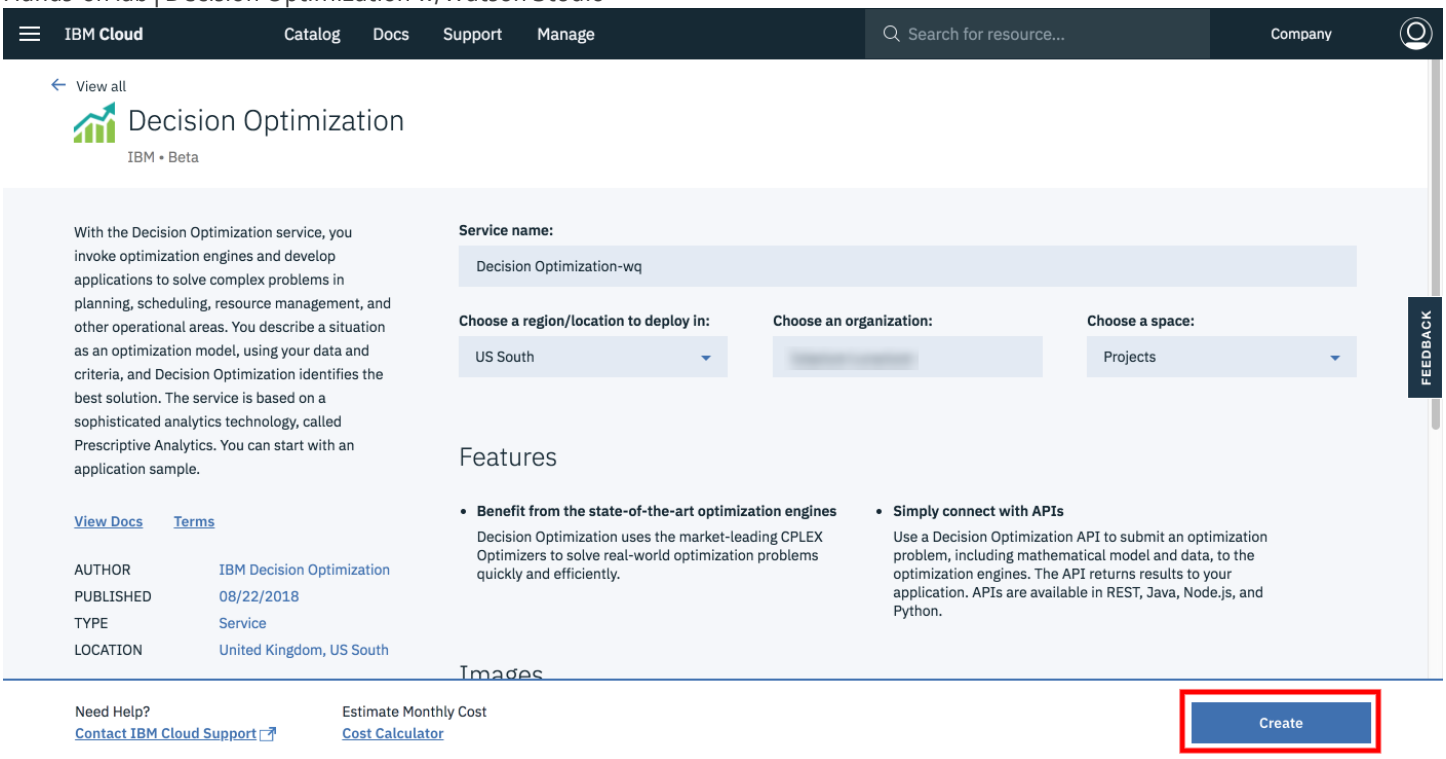
In this step you'll instantiate a Decision Optimization service to call from your notebook code to solve a business problem.

From the Catalog search for **decision optimization** and click on the **Decision Optimization** tile:

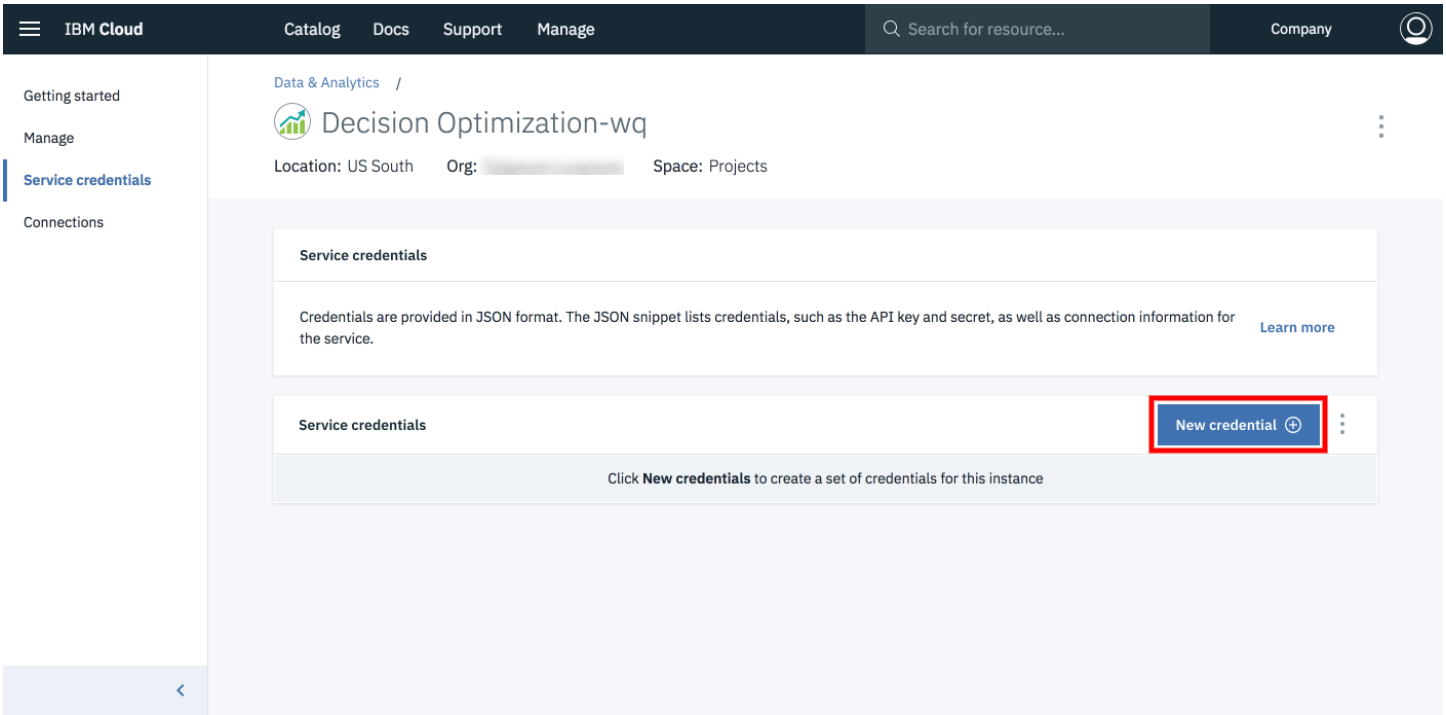


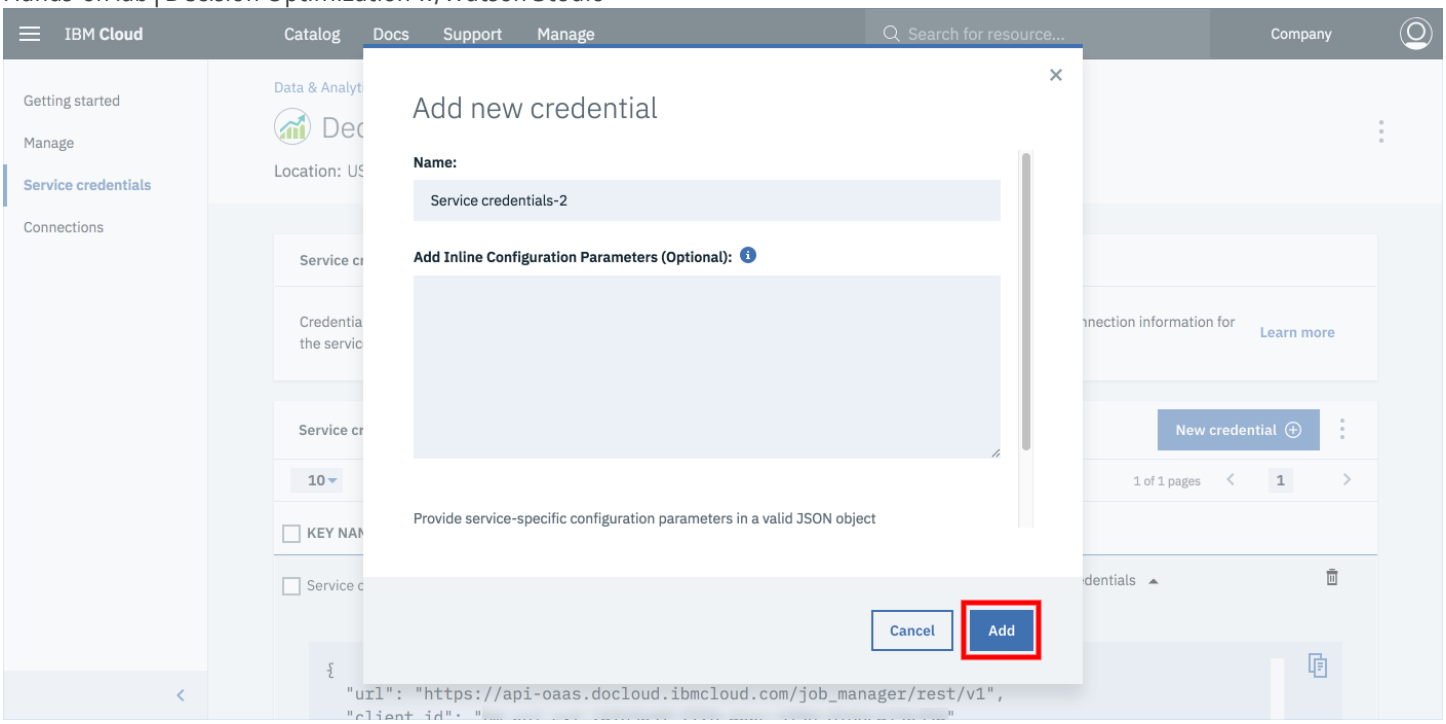
Specify the desired options or accept the defaults and click **Create***:

**depending on your account type you may see Upgrade – if that is the case go ahead and click Upgrade to get a Pay-As-You-Go account or alternatively sign up for a free trial (http://onboarding-oaas.docloud.ibmcloud.com/software/analytics/docloud/)*

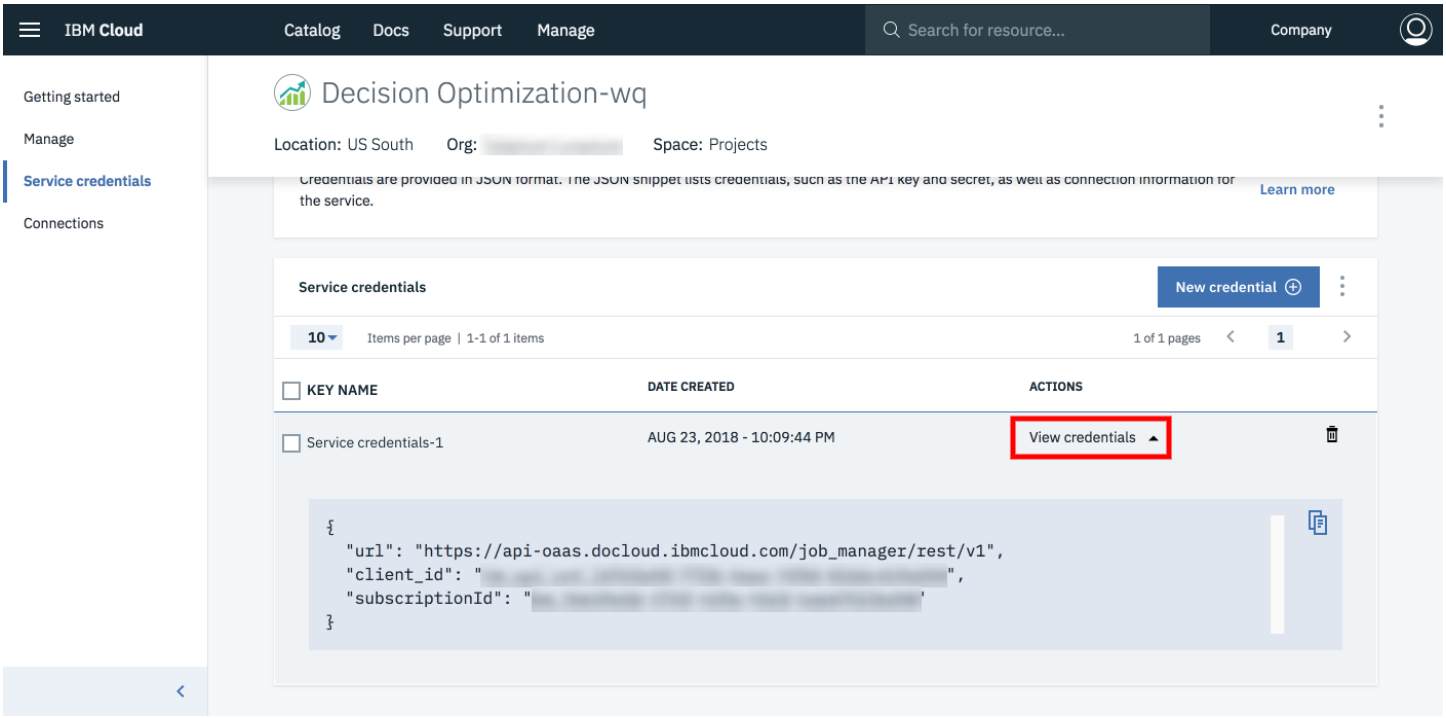


The service will instantiate in a few moments. Click the **Service credentials** tab and then **New Credential** in the right-hand pane. In the modal that appears accept the default values and click **Add** to create API credentials for the service and take a note of them – you'll need them for later use in your Jupyter Notebook:





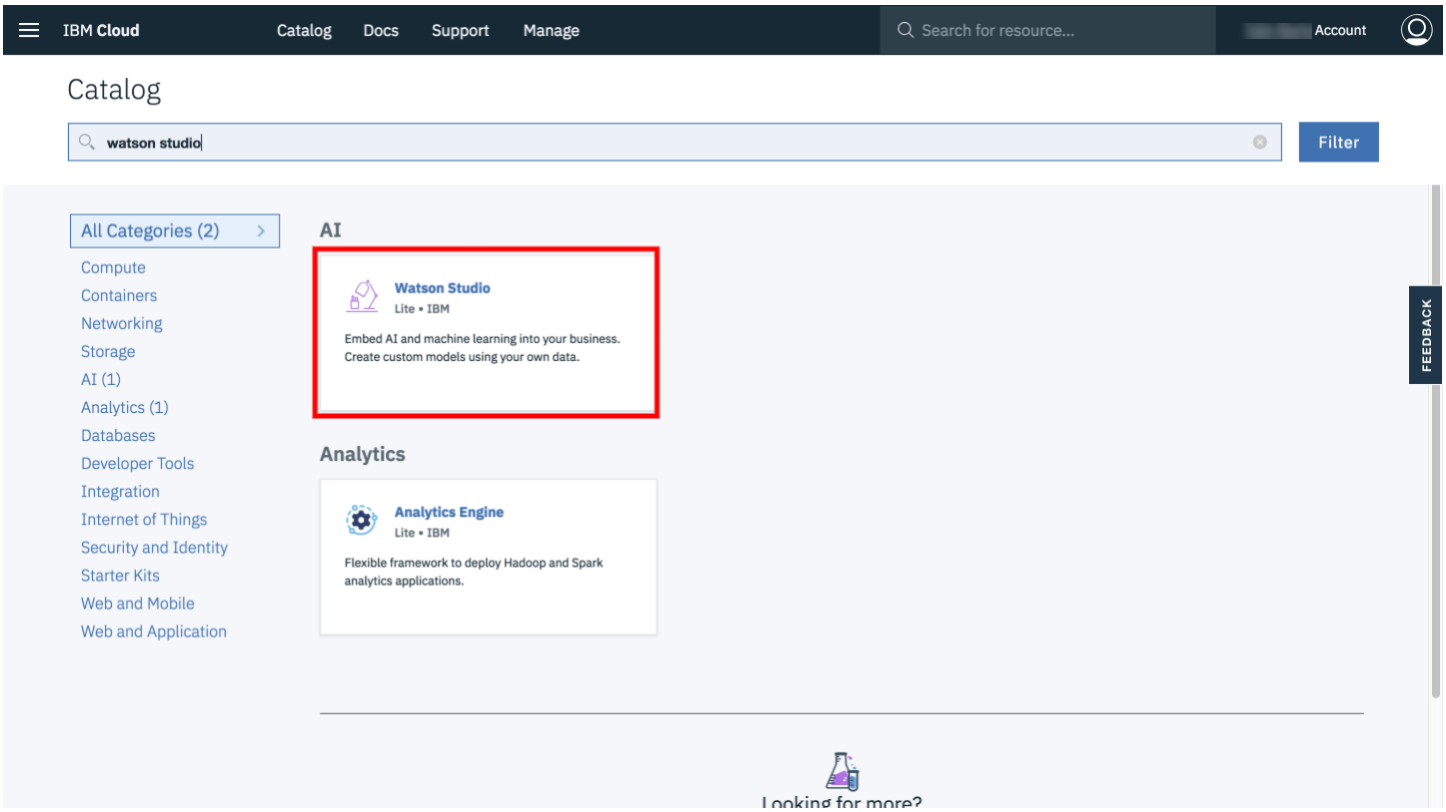
Click **View credentials** to see the credentials and save them for later use:



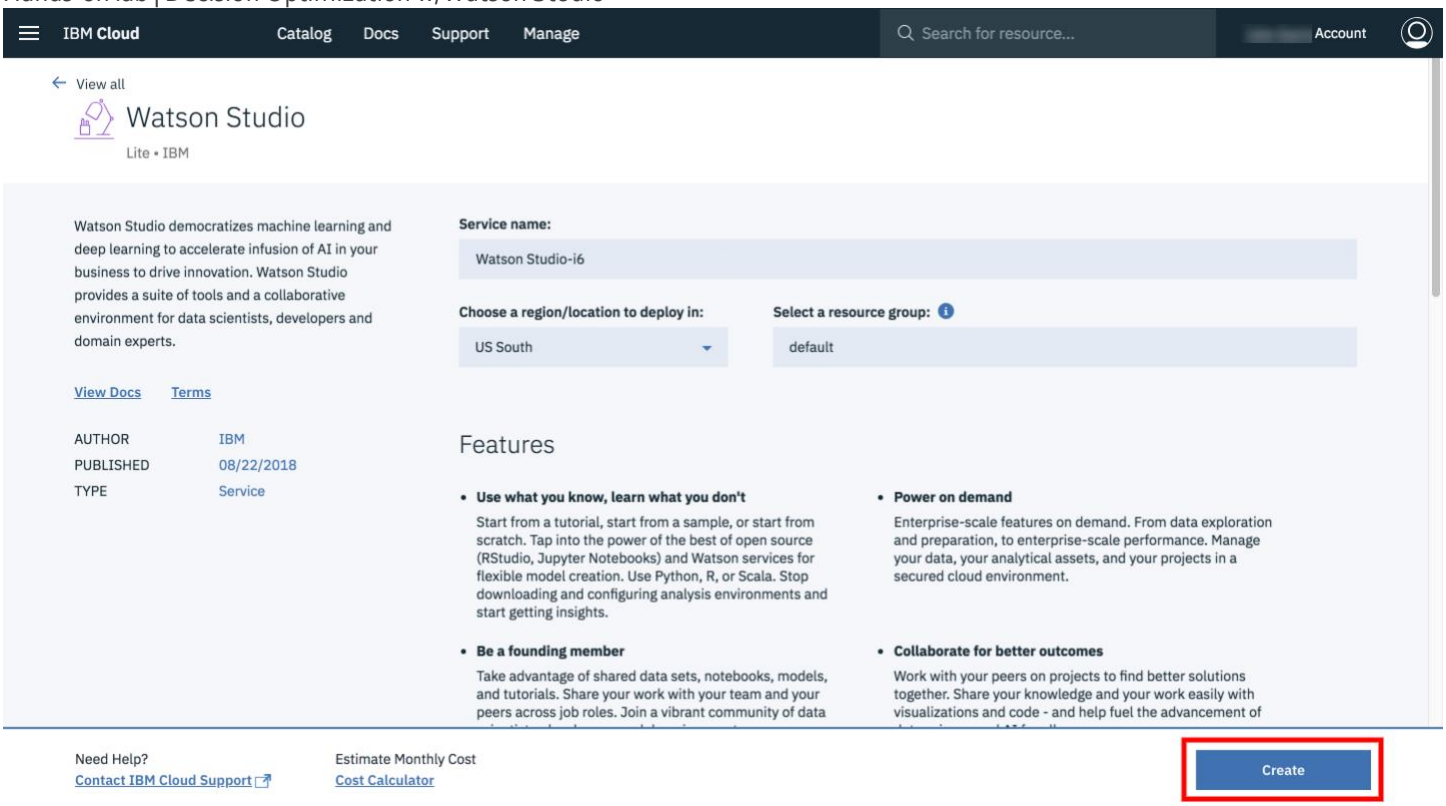
Step 3: Create a Watson Studio service

In this step you'll instantiate a Watson Studio service – this is the integrated data science environment where you'll run code within a Jupyter Notebook to solve a business problem.

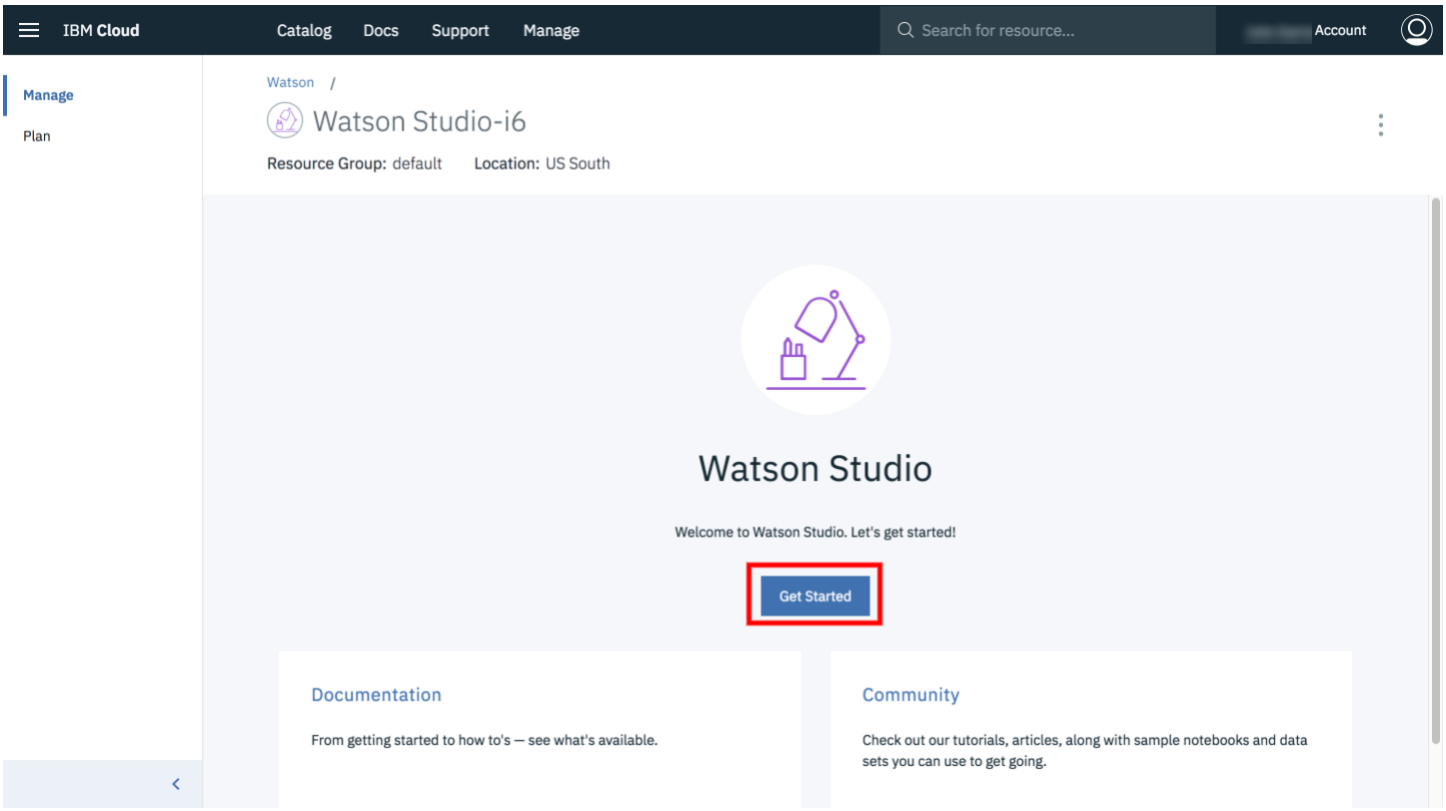
Go to the Catalog and search for **Watson Studio** and click on the **Watson Studio** tile:



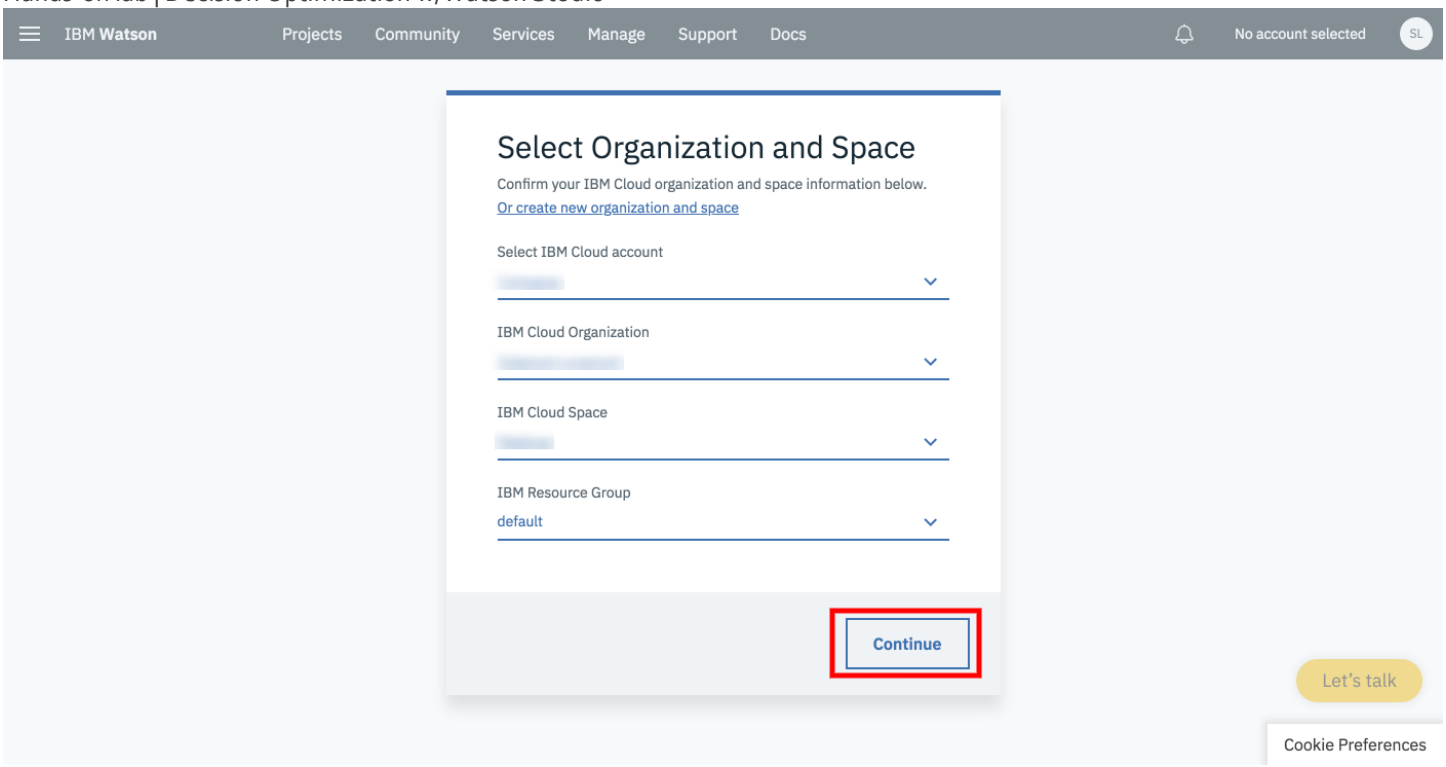
Specify the desired options or accept the defaults and click **Create**:



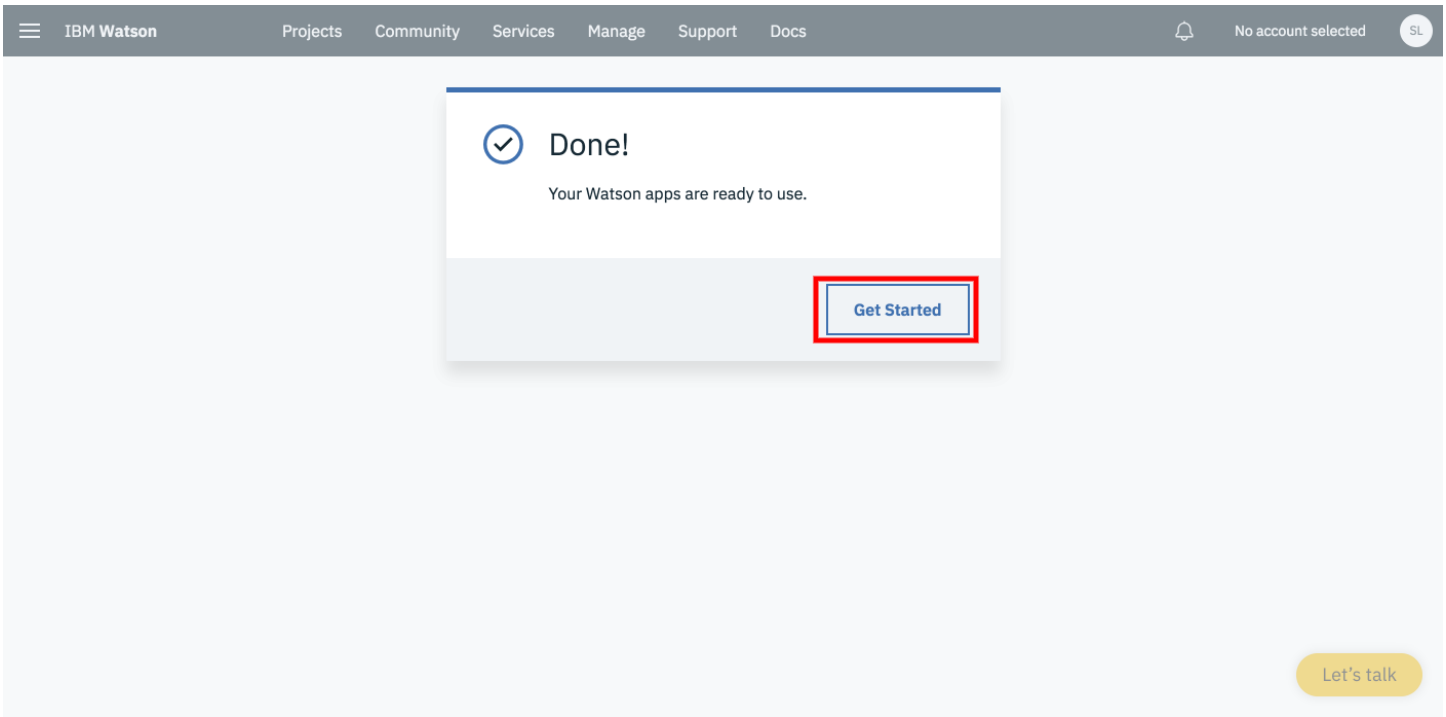
The service will instantiate and in a few moments the Watson Studio overview panel will appear. Click **Get Started** to launch the Watson Studio interface:



Specify the desired options in the modal that appears and then click **Continue**:



Click Get Started:

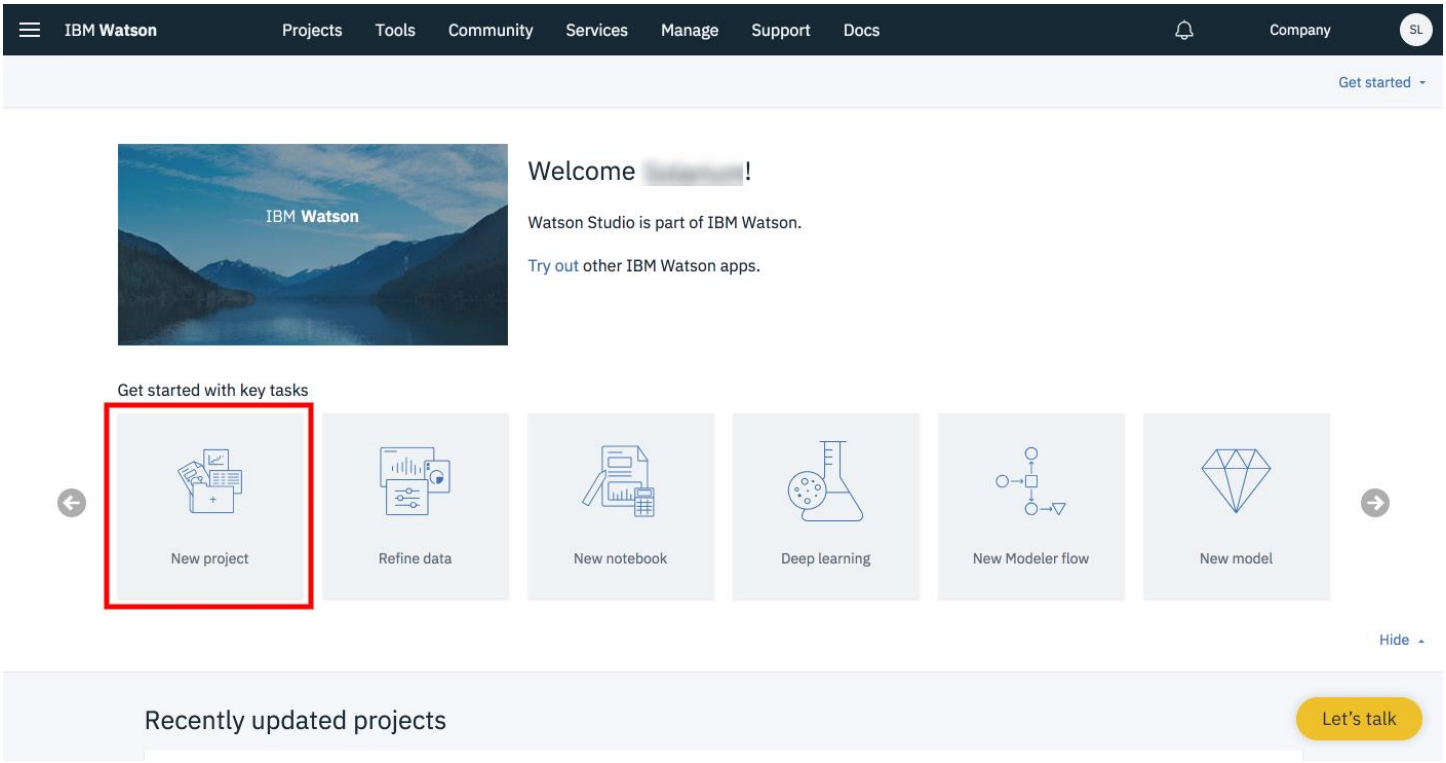


The landing view for Watson Studio will appear. Continue on to the next step to create a project.

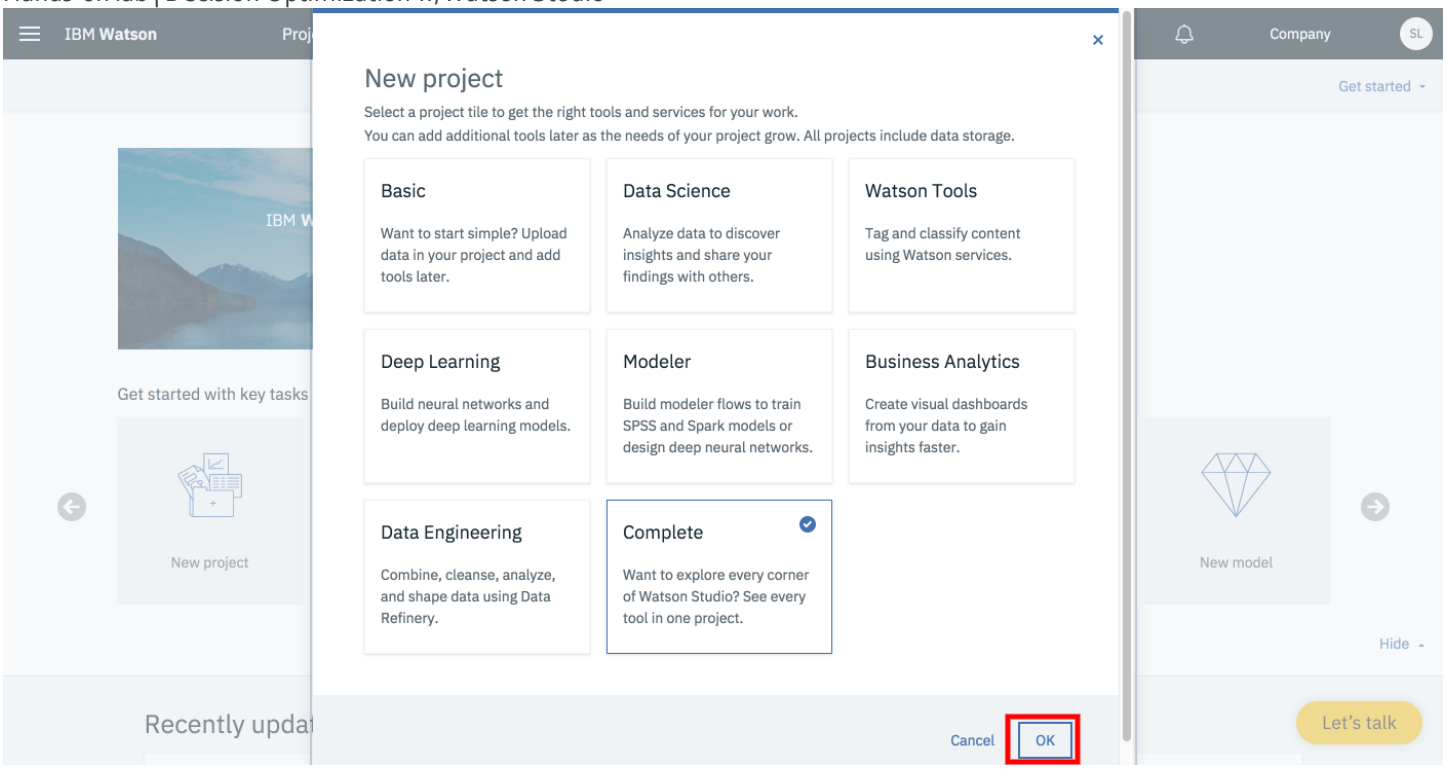
Step 4: Create a project in Watson Studio

In this step you'll create a project within Watson Studio – projects serve as a unifying unit of governance for your work within this data science environment.

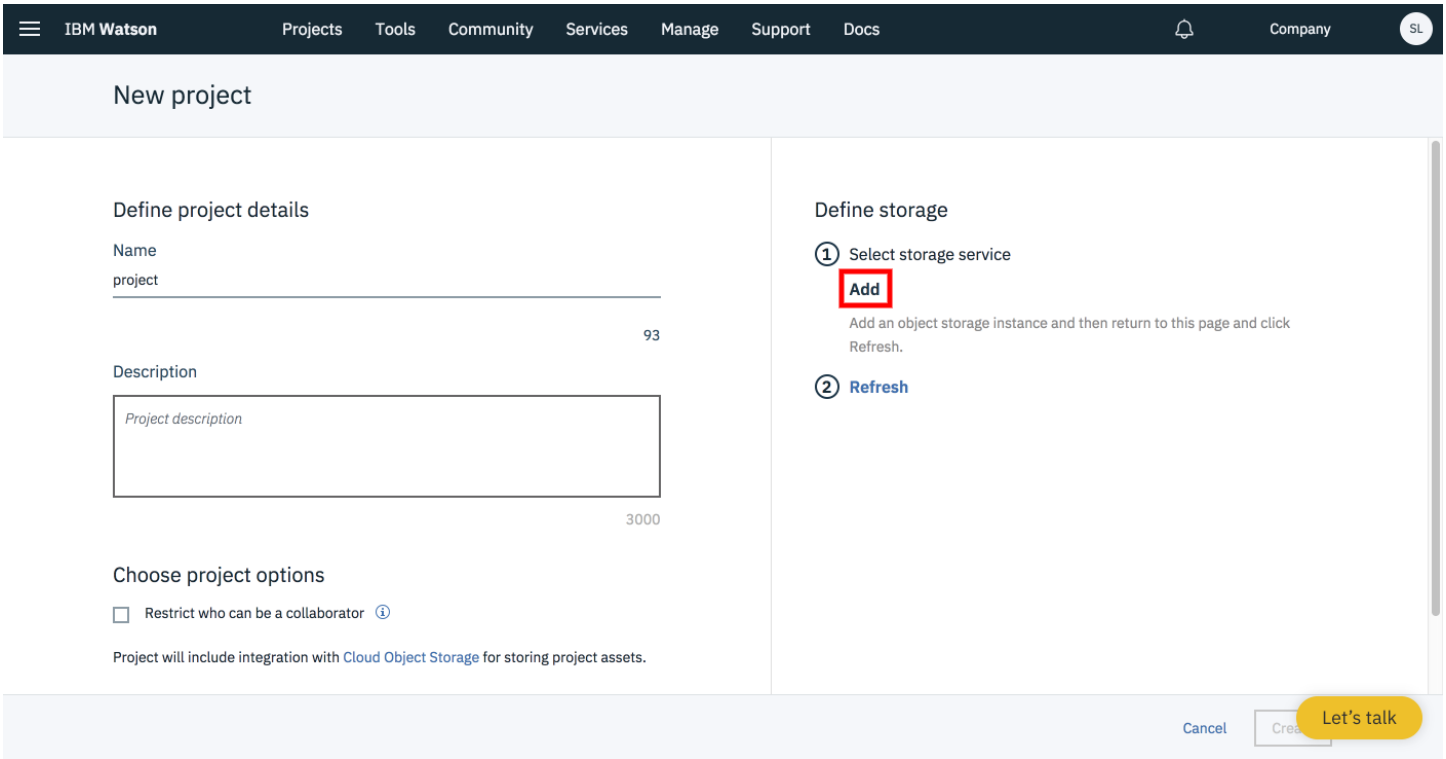
Click **New project**:



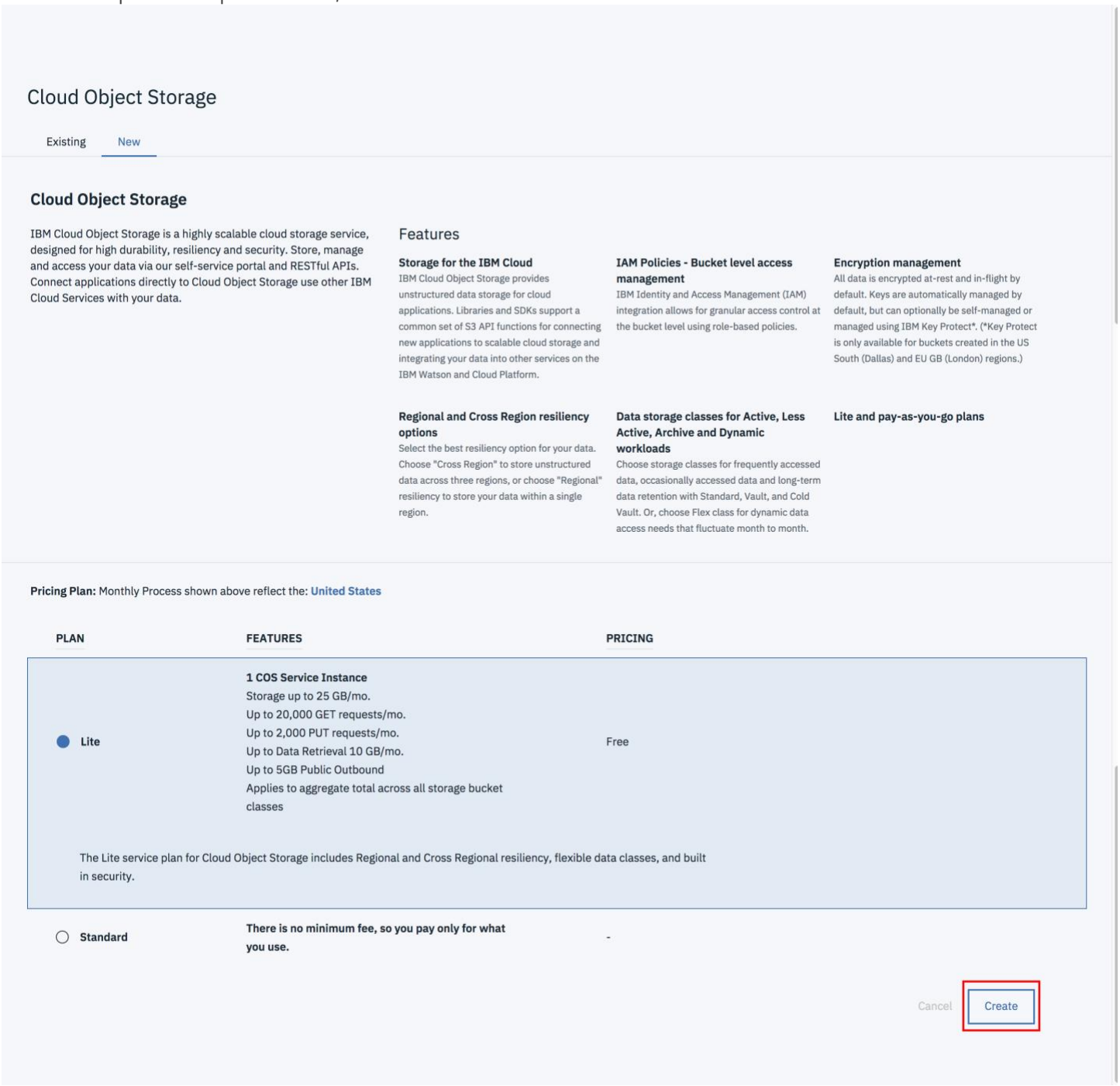
Select **Complete** in the New project modal and then **OK**:



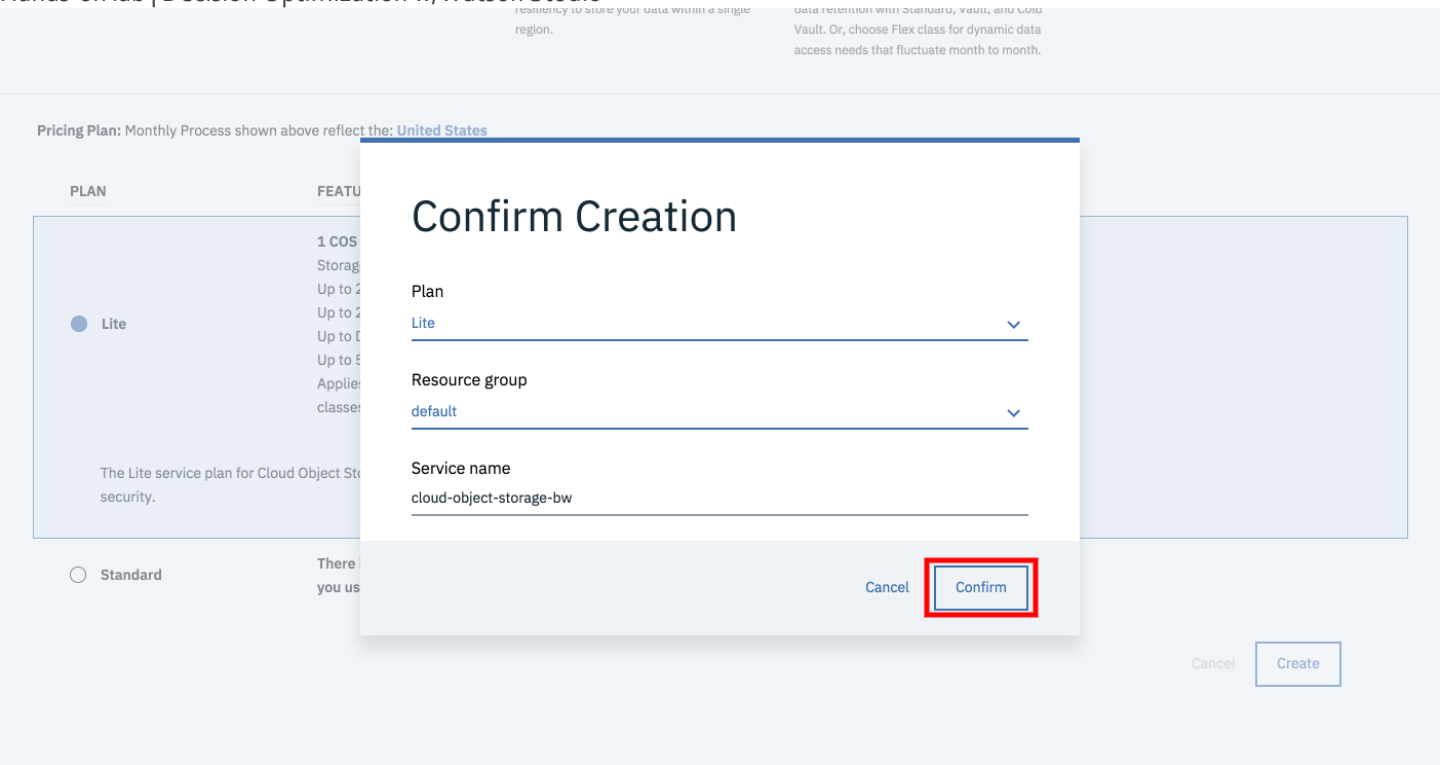
In the New project screen that appears you'll need to specify a project Name and then click **Add** within the right-hand Define storage panel to add an instance of Object Storage for use with your Watson Studio environment. The Object Storage instance is where Watson Studio will store your data assets:



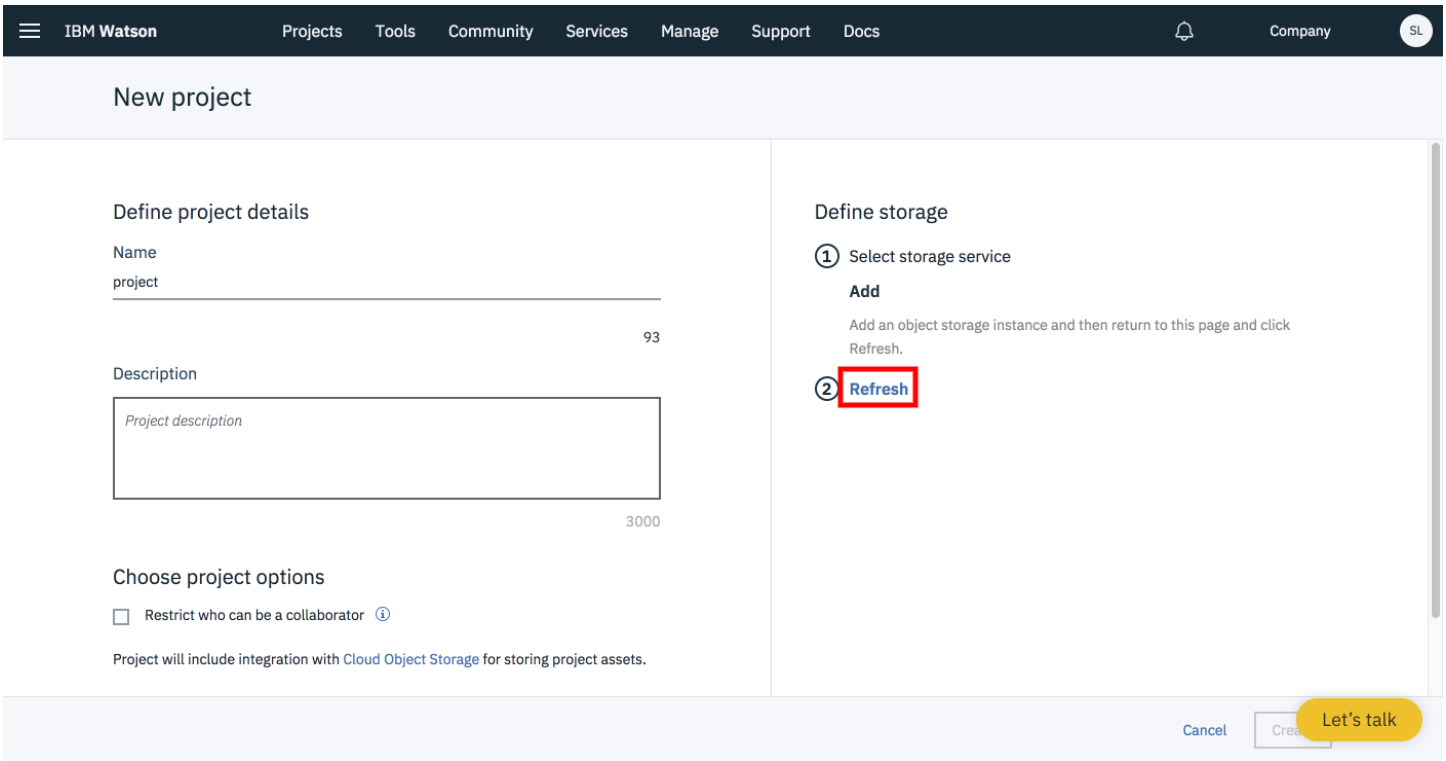
The Cloud Object Storage page appears in a new browser tab. Select the **Lite** plan and then click **Create**:



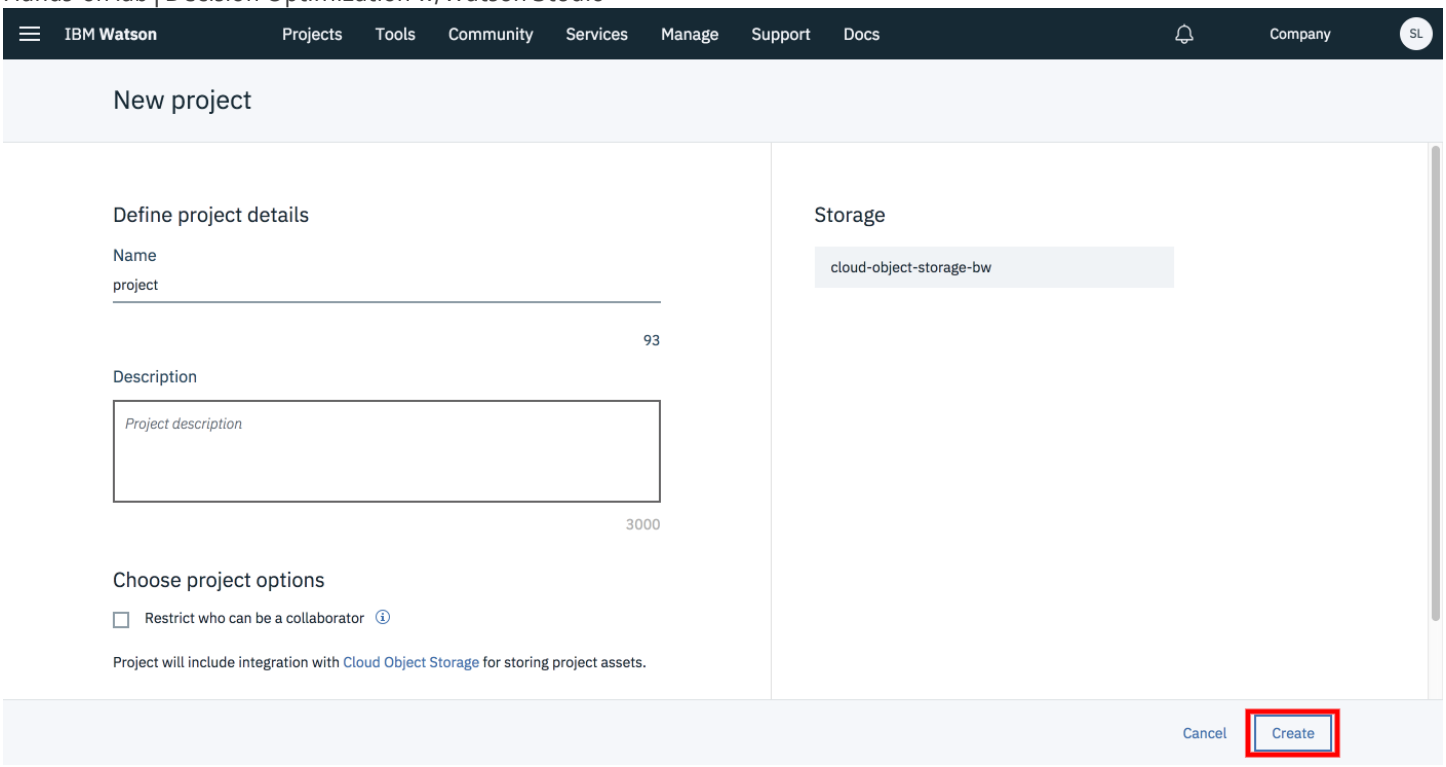
Click **Confirm** in the Confirm Creation modal that appears:



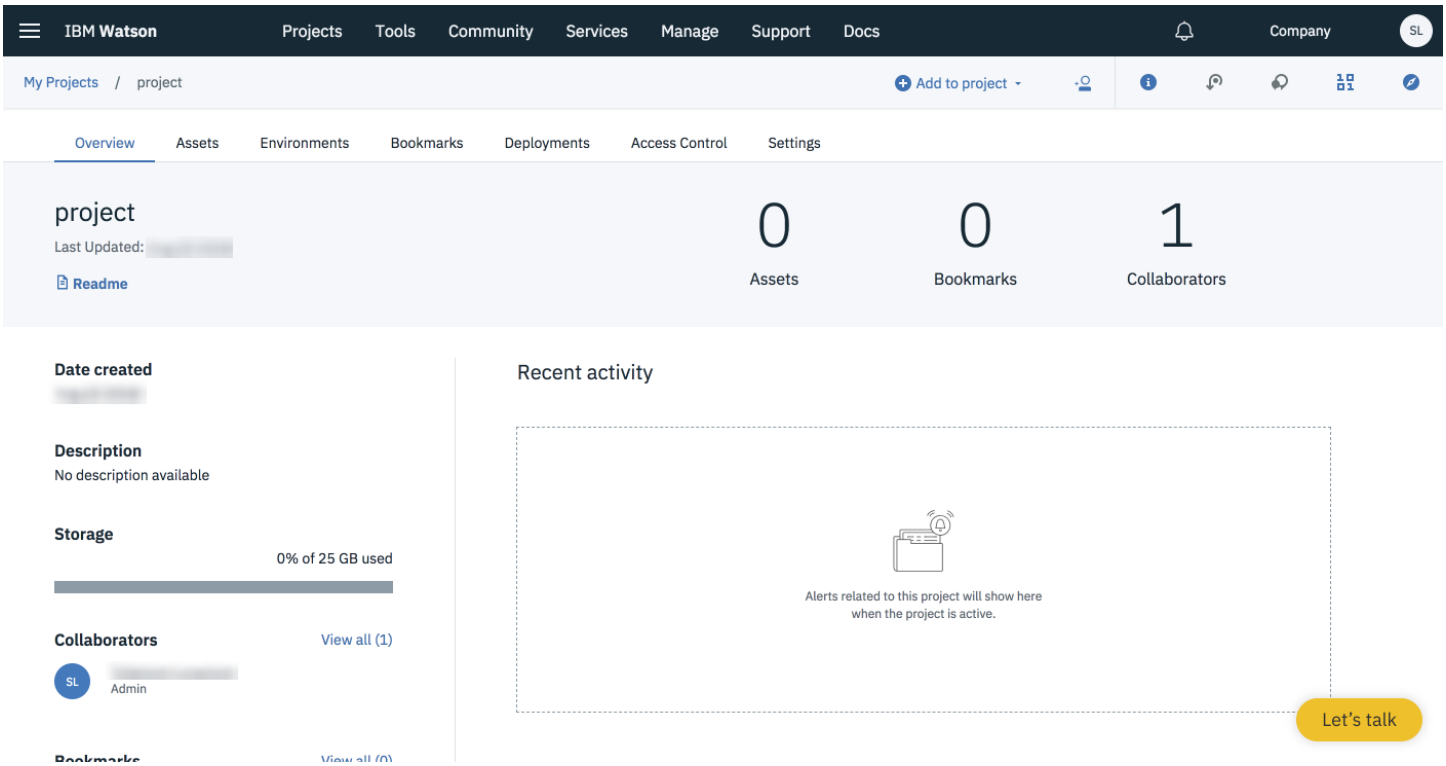
The tab should automatically close. In the New project view click the **Refresh** button:



The Object Storage instance will appear specified as the Storage value. Click **Create** to create the project:



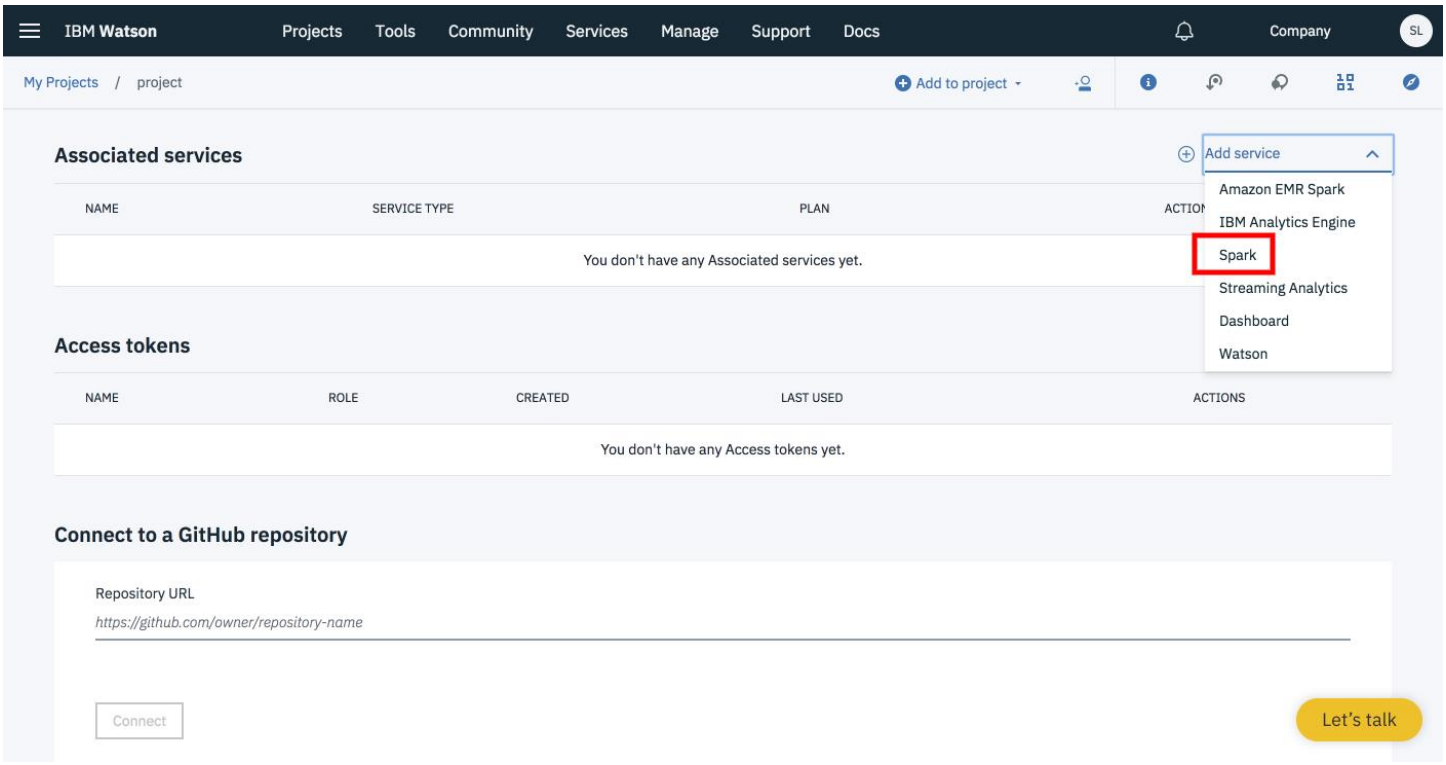
You'll now see the landing page for the new project:



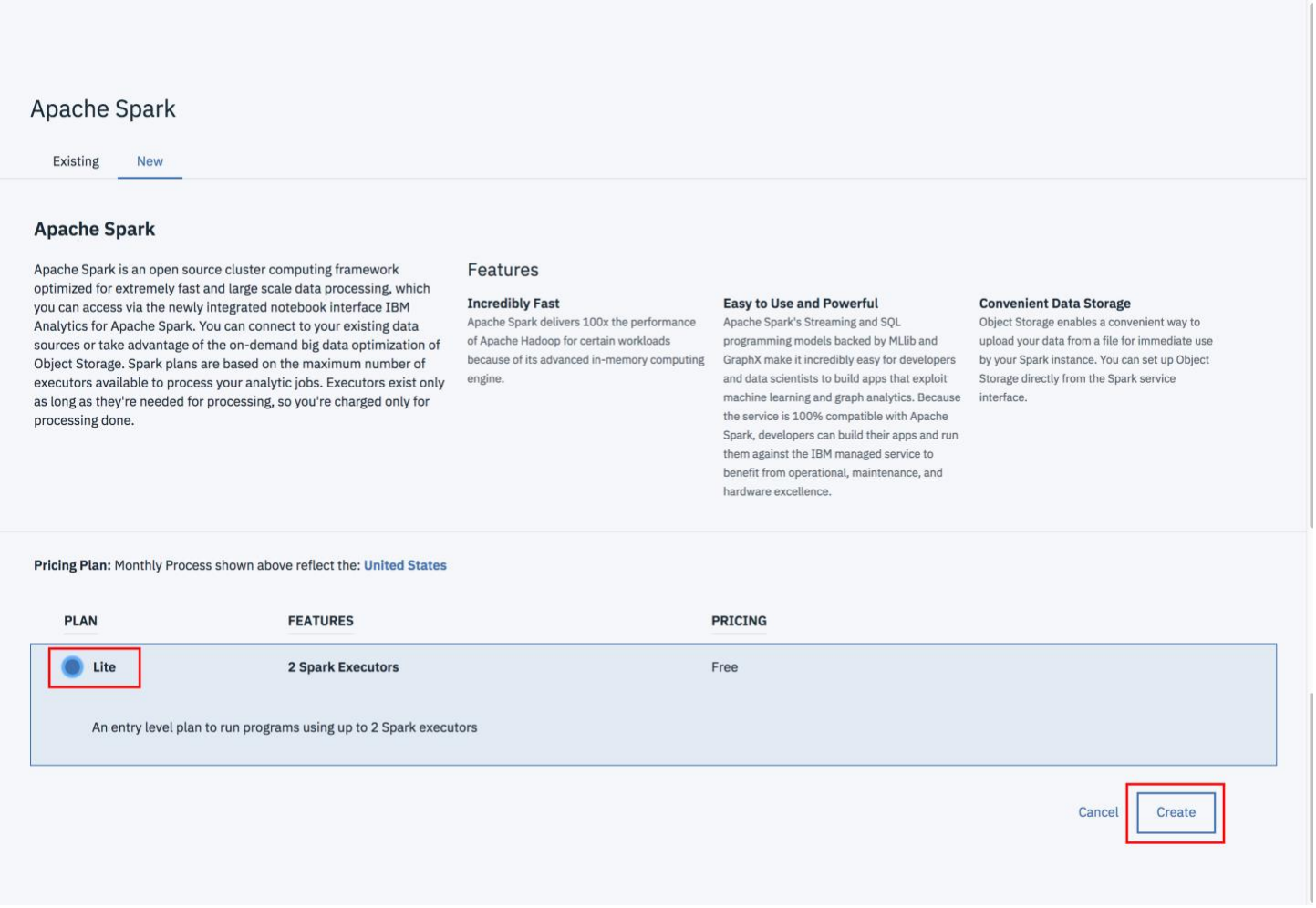
Step 5: Add an Apache Spark service

In this step you'll add an Apache Spark service for use as a runtime for solving a business problem specified in the notebook you'll copy in the next step.

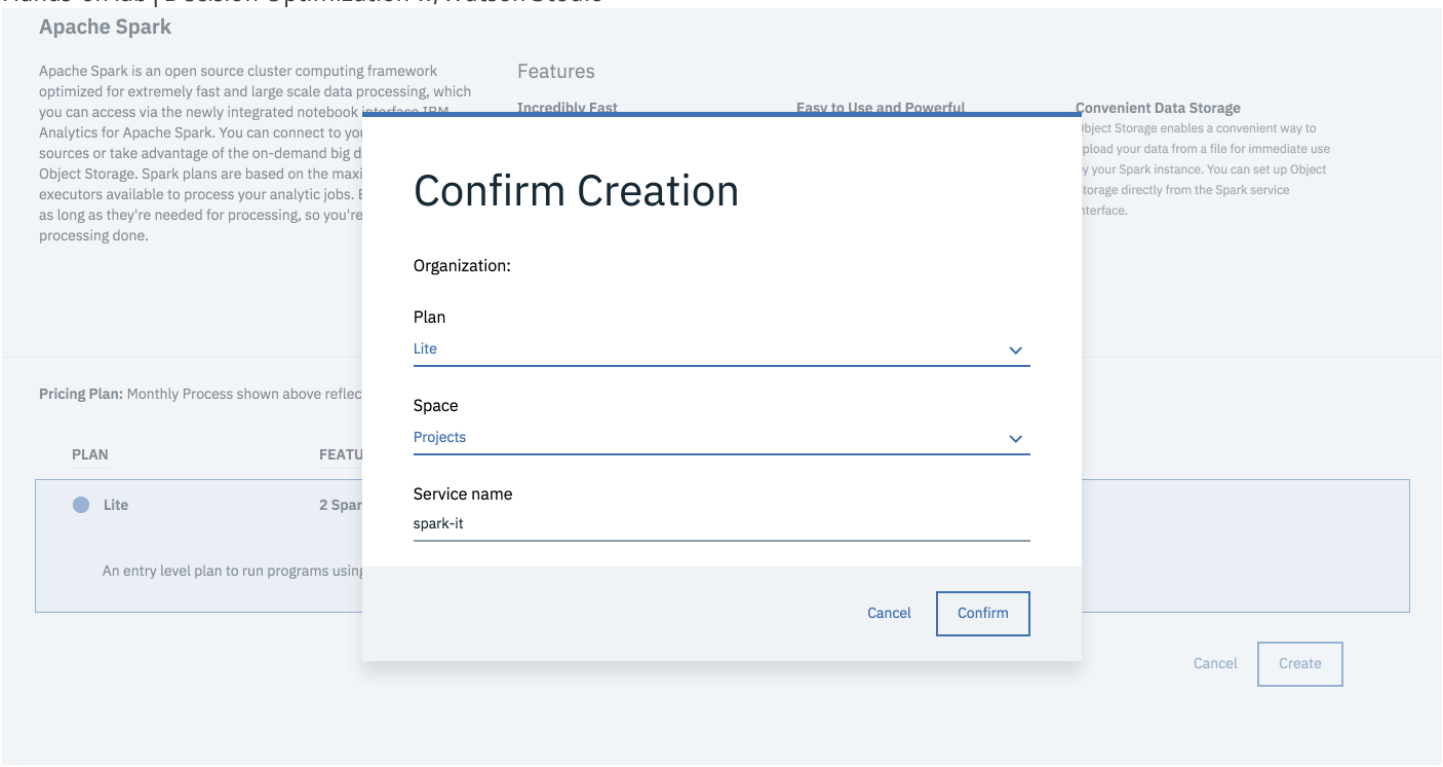
Click the **Settings** tab for your project and then scroll down to the Associated services section. Click **Add service** and select **Spark**:



In the Apache Spark page that appears select **Lite** for the Plan and then click **Create**:



Specify the desired values in the Confirm Creation modal that appears and then click **Confirm**:

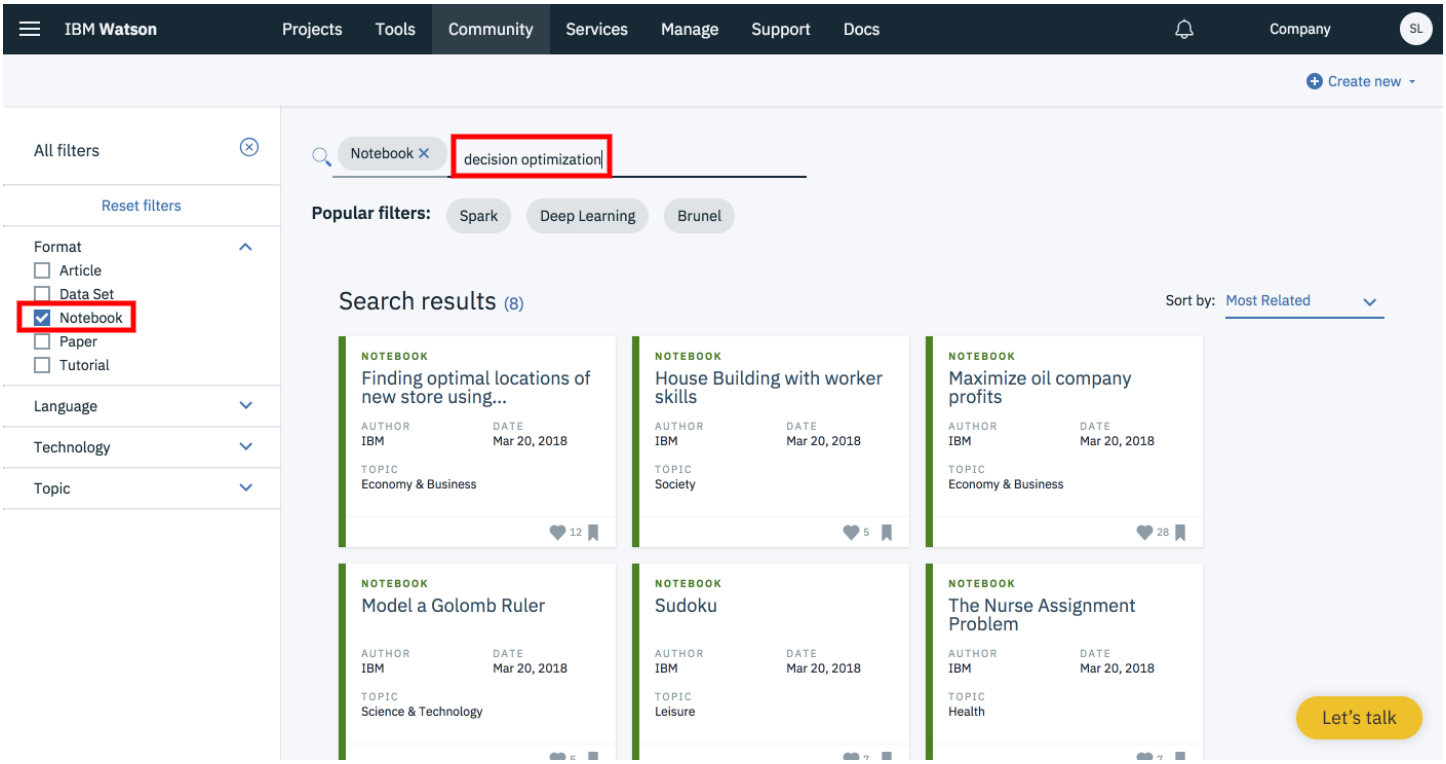


You are now ready to add a notebook to your project.

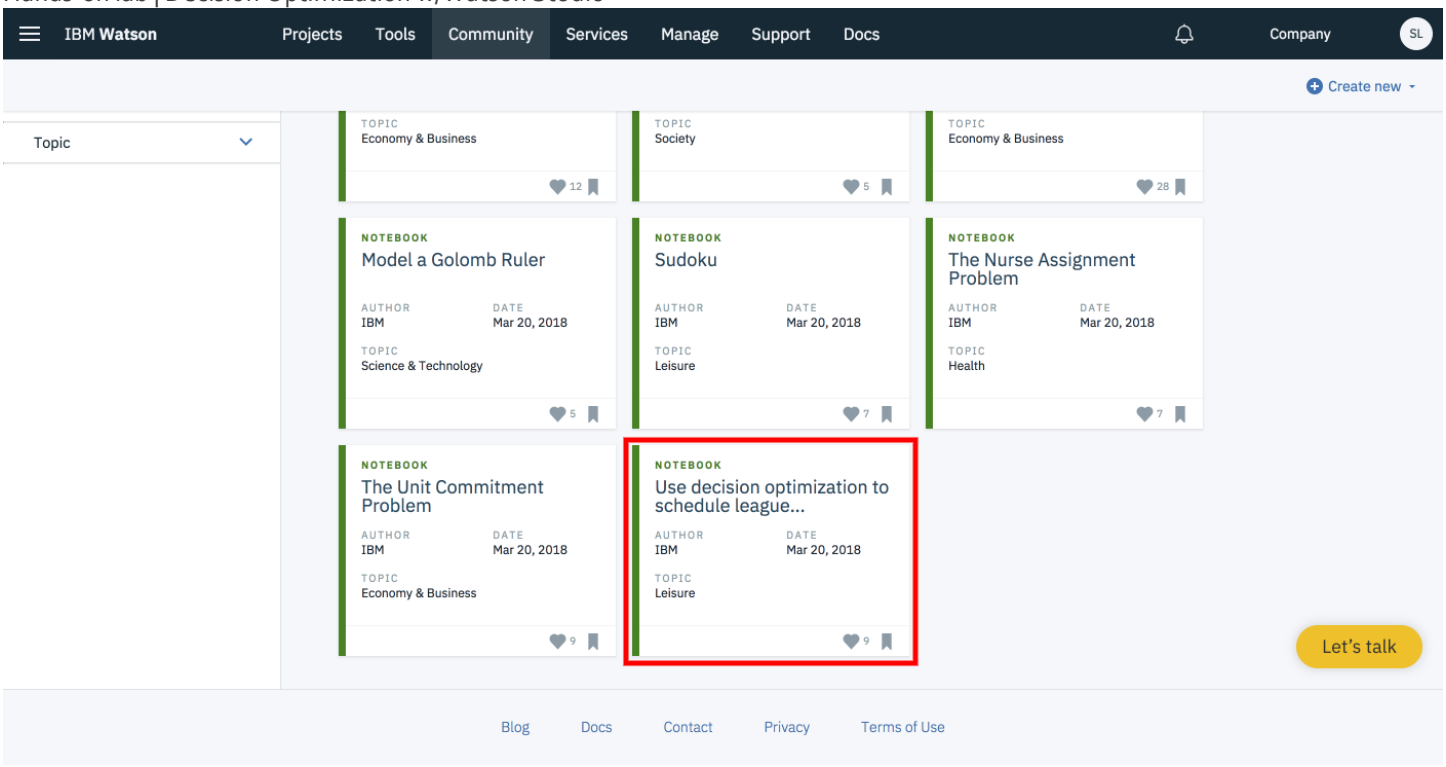
Step 6: Copy a Jupyter Notebook

In this step you'll copy an existing public Jupyter Notebook into your project.

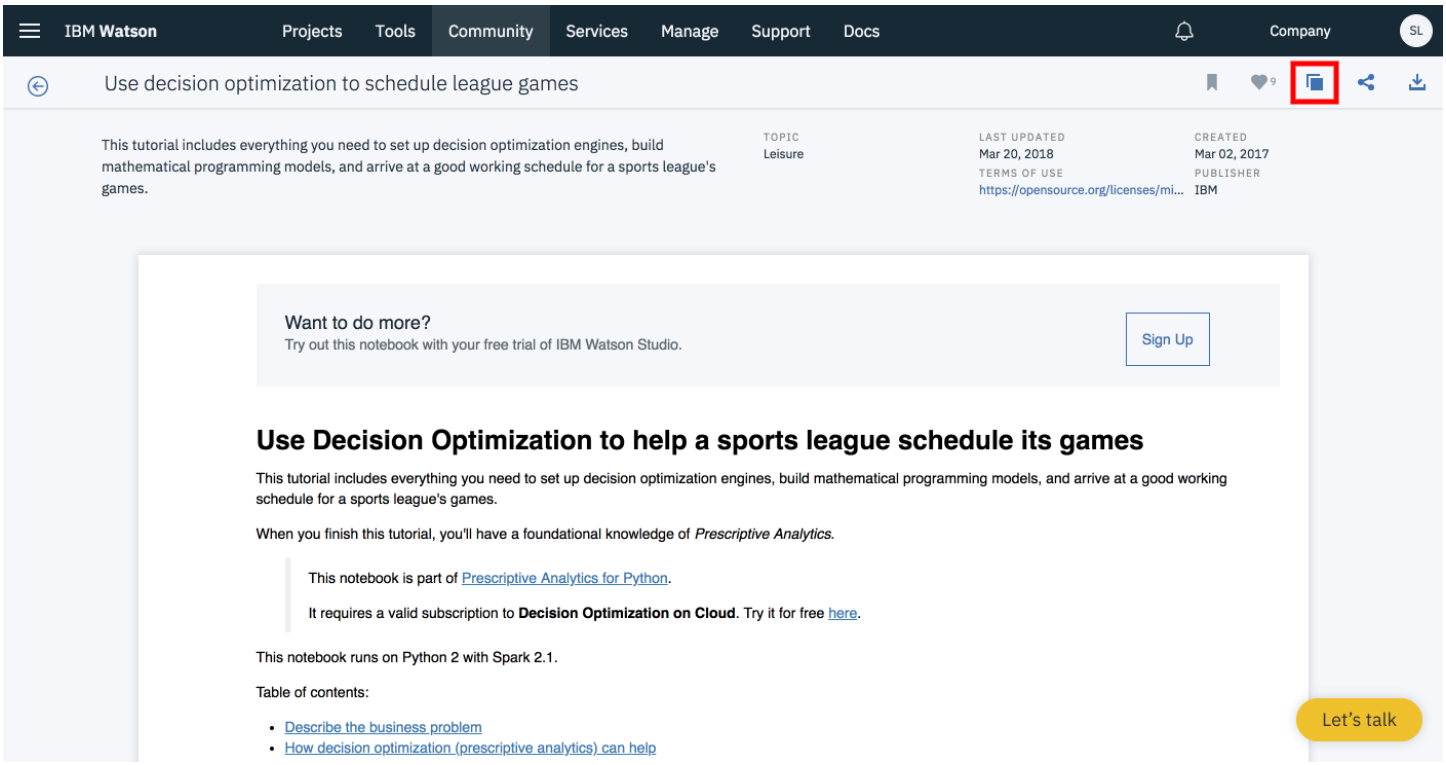
Navigate to the Community by clicking the **Community** tab within the top menu bar. The Community is a resource of tutorials, articles, sample notebooks, and data sets to get you quickly up and running with Watson Studio. Once there apply the **Notebook** filter and type **decision optimization** in the search bar to narrow the results further:



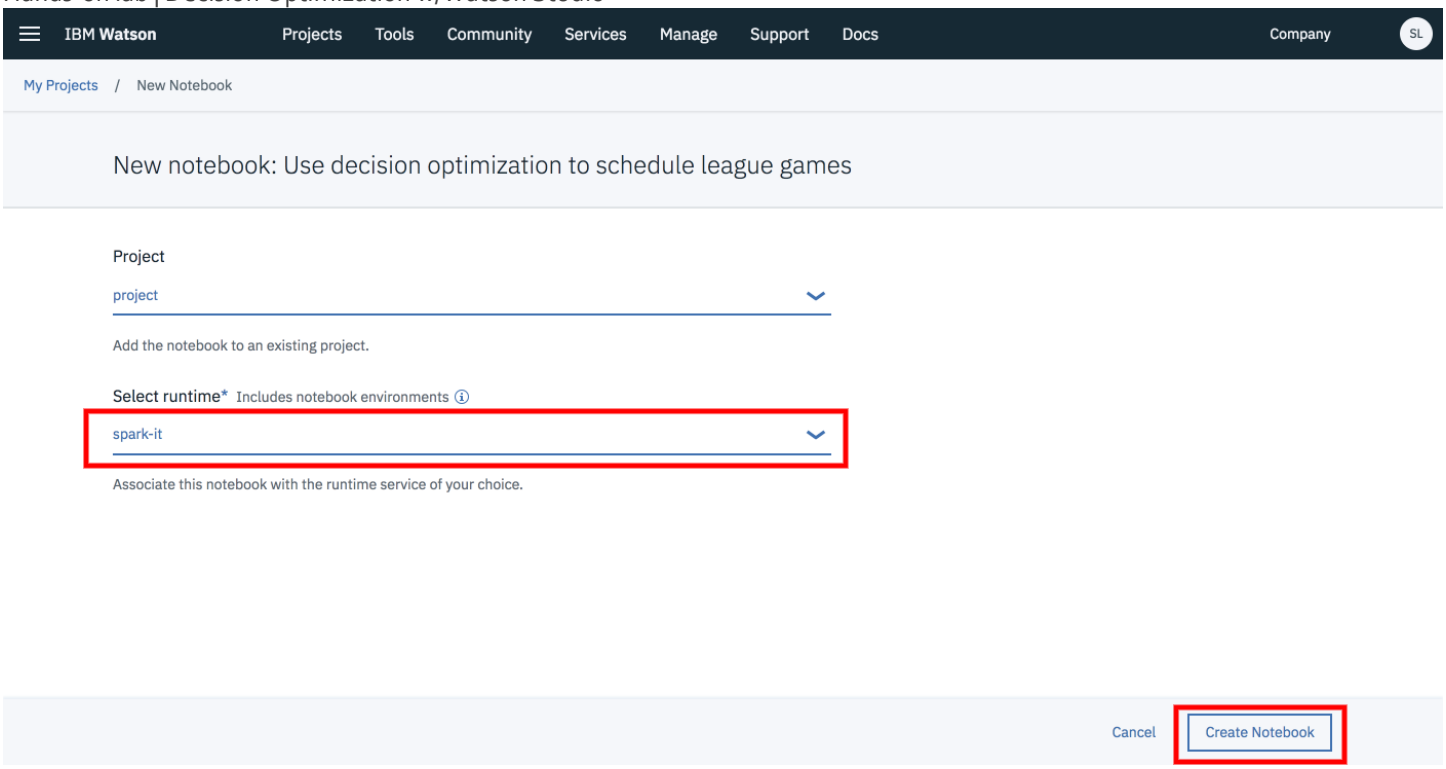
Scroll down and select the **Use decision optimization to schedule league…** tile:



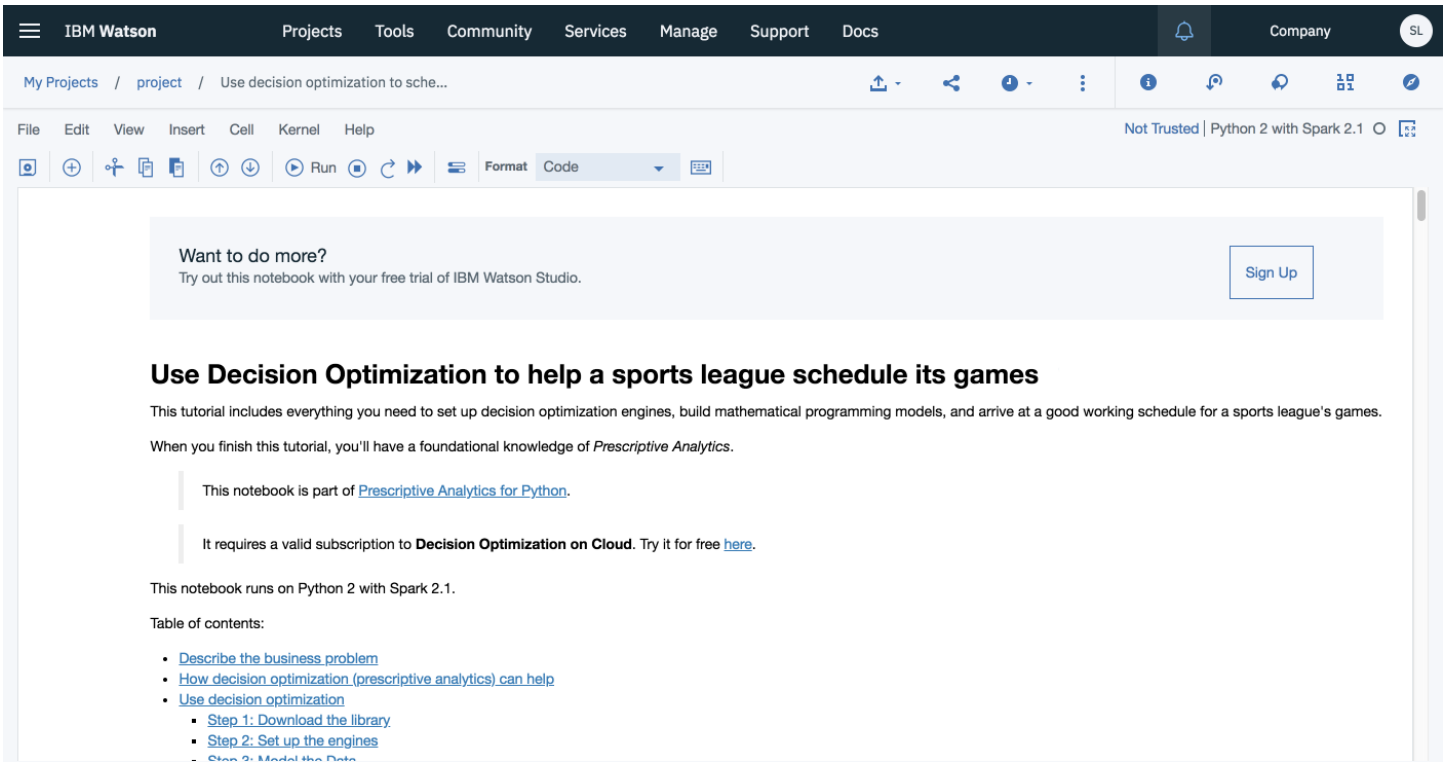
An overview of the notebook will appear. Click the **Copy** icon in the top right-hand corner to copy the notebook to your project:



The New Notebook view will appear. Select the previously-created spark instance from the **Select runtime** drop-down and click **Create Notebook**:



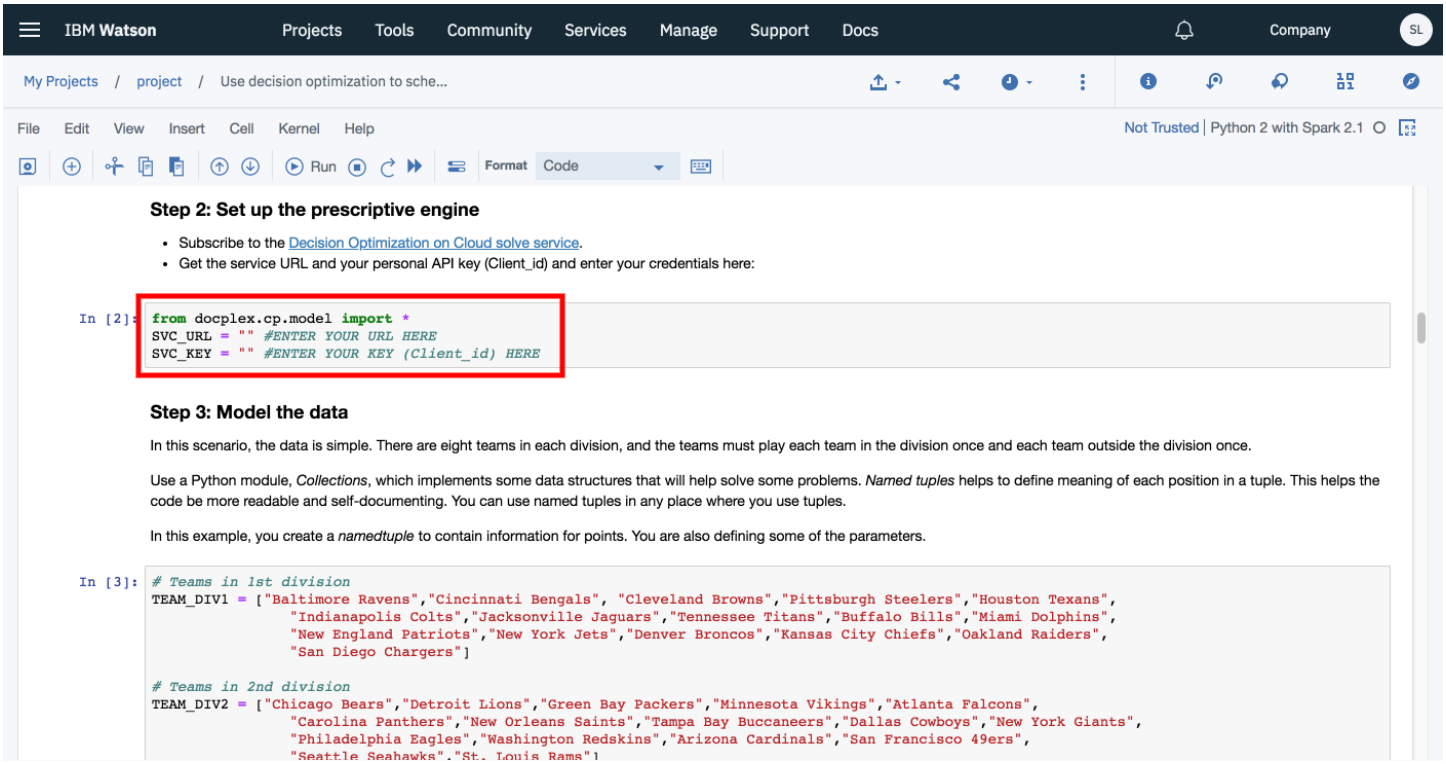
The copied notebook will appear in your project. This notebook contains code that models a decision optimization problem around scheduling a league of games:



Step 7: Incorporate the Decision Optimization service

In this step you'll insert your Decision Optimization credentials into the appropriate cell within the notebook in order to make use of your Decision Optimization instance.

Scroll down to cell 2 of the notebook and enter your Decision Optimization credentials on the appropriate lines as specified by the comments:

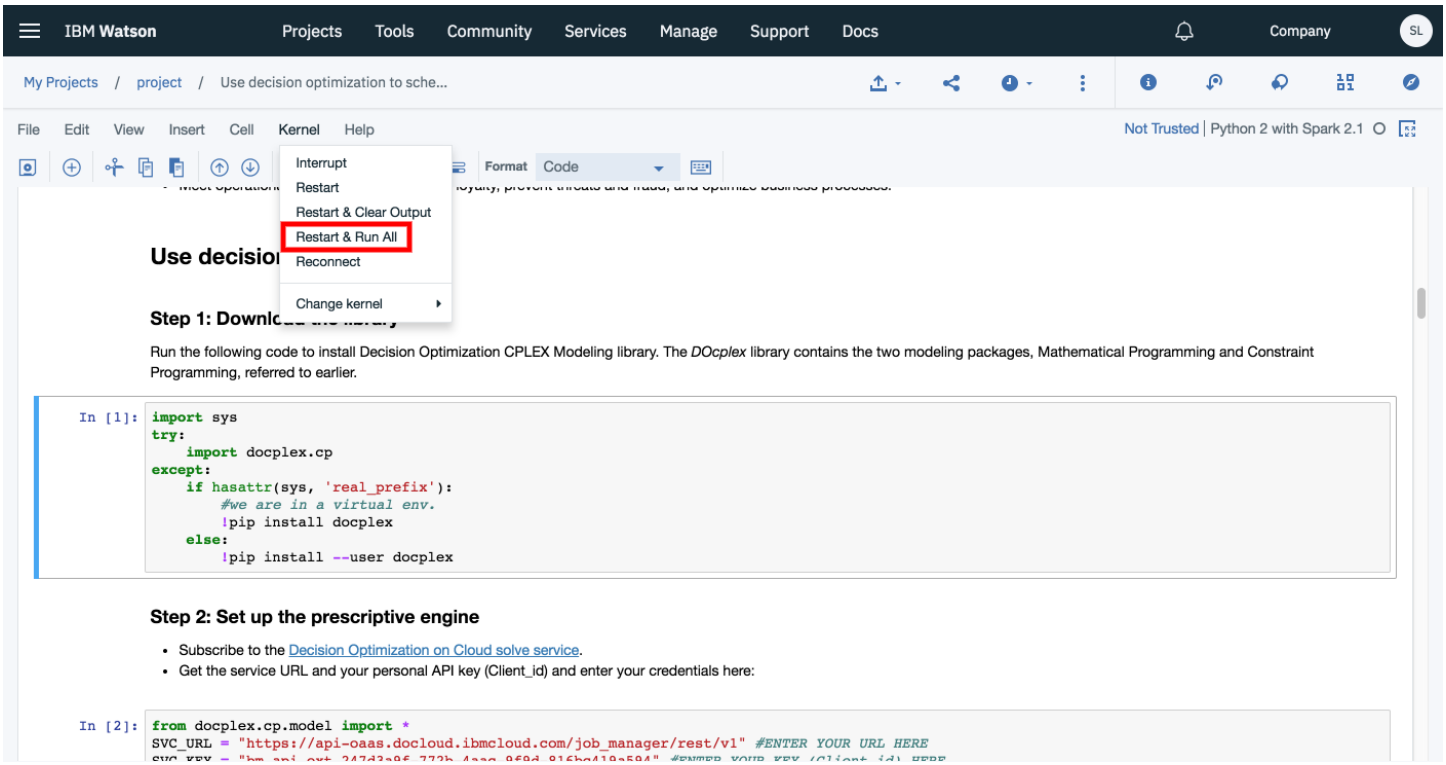


Now you're finally ready to run a decision optimization problem to solve a business problem!

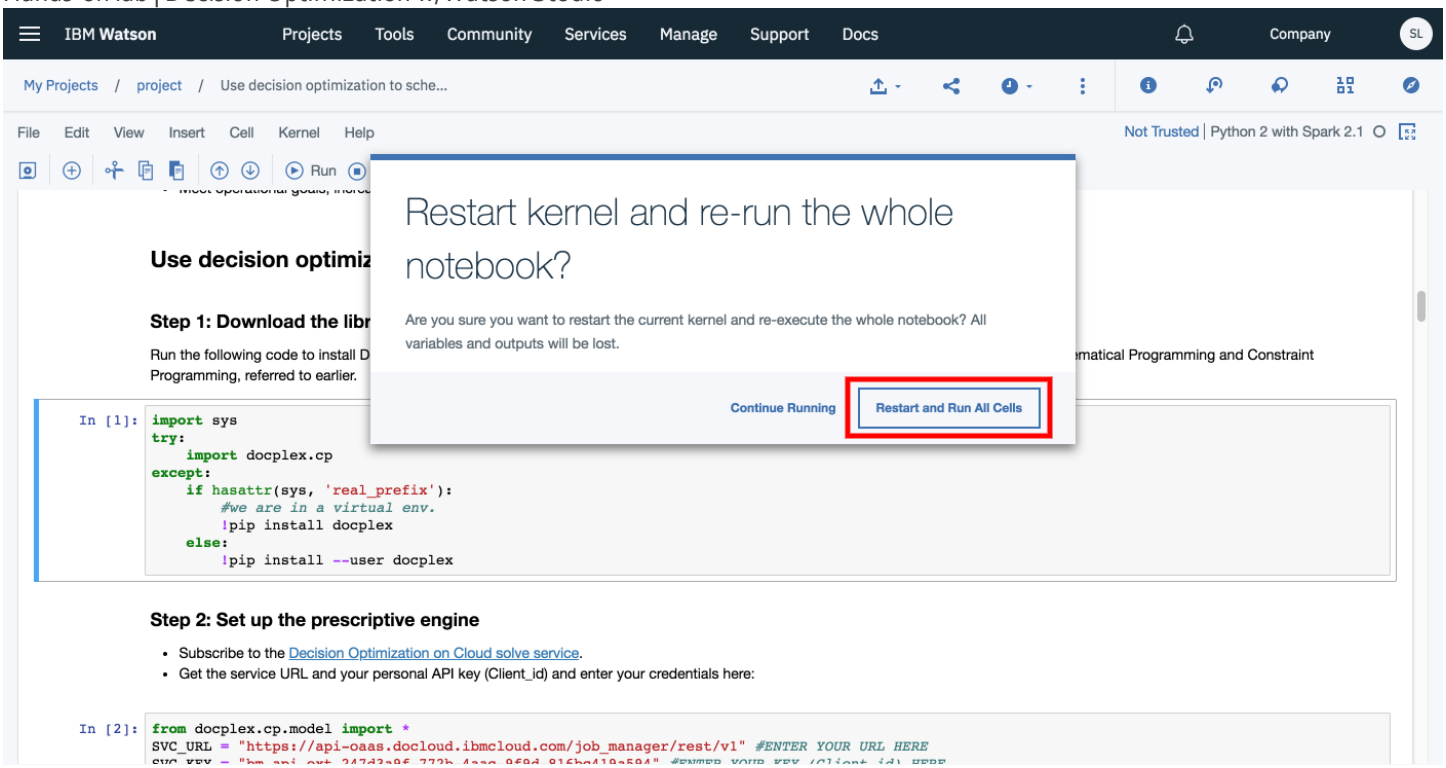
Step 8: Run the notebook

In this step you'll run the notebook cells and see the outputs to solve a business problem.

In the **Kernel** menu select **Restart & Run All** to run all cells of the notebook:



Confirm the run by clicking **Restart and Run All Cells**:



Watch as each cell executes in the notebook. The end result is the solving of a decision optimization problem.

Step 9: Next steps

Congratulations! You've now completed this lab and have successfully run a notebook in Watson Studio that makes use of the Decision Optimization service to solve a business problem. This is just the tip of the iceberg in terms of what you can accomplish with Watson Studio and Decision Optimization for your business. For more information on how to incorporate these tools to realize value for your business please consult the links found below:

https://console.bluemix.net/docs/services/DecisionOptimization/DecisionOptimization.html

https://developer.ibm.com/docloud/documentation/docloud/

https://developer.ibm.com/docloud/

https://dataplatform.cloud.ibm.com/docs/content/getting-started/overview-ws.html

https://dataplatform.cloud.ibm.com/docs/content/DO/DOinDSX.html