

IBM Cloud

Predicting Customer Churn

Watson Data Platform



Lab Guide





Notices and Disclaimers

© Copyright IBM Corporation 2018.

The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. This information is based on current IBM product plans and strategy, which are subject to change by IBM without notice. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.

IBM, the IBM logo and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at ibm.com/legal/copytrade.shtml

Other company, product and service names may be trademarks or service marks of others

Document Revision History

Rev #	File Name	Date
1.0	DSX Hands-on Workshop.docx	11/1/2017
1.1	Predicting Customer Churn with Watson Data Platform Lab.docx	1/17/2018

Prepared & Revised by:

Louis Frolio – louis.frolio@ibm.com

Table of Contents

Lab Environment Overview.....	5
Lesson 1: DSX Signup & Home Page	6
Lesson 1: Workflow Overview	7
Lesson 1: Instructions	8
Lesson 2: Jupyter Notebook.....	13
Lesson 2: Workflow Overview	14
Lesson 2: Instructions	15
Lesson 3: Machine Learning Flows	24
Lesson 3: Workflow Overview	25
Lesson 3: Instructions	26
Lesson 4: Watson Machine Learning	33
Lesson 4: Workflow Overview	34
Lesson 4: Instructions	35



Lab Environment Overview

Software and Tools

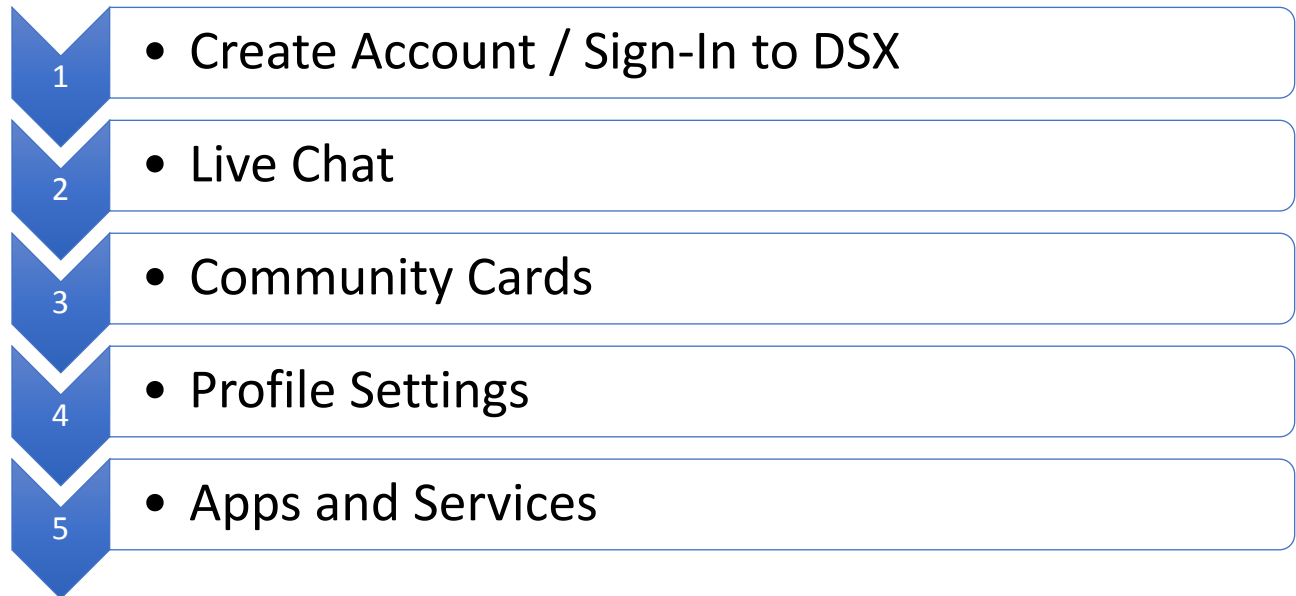
Software	Link
IBM Data Science Experience (DSX)	https://datascience.ibm.com/



Lesson 1: DSX Signup & Home Page

Purpose:	This lab introduces DSX, its sign up and walk-through of the features and functions starting at the Home Page.
Tasks:	<p>Tasks you will complete in this lab exercise include:</p> <ul style="list-style-type: none">• Create/Sign-In to DSX Account• Engage Live Chat• Differentiate Four Types of Community Cards• Explore Personal Profile, Apps/Services, and Integrations

Lesson 1: Workflow Overview

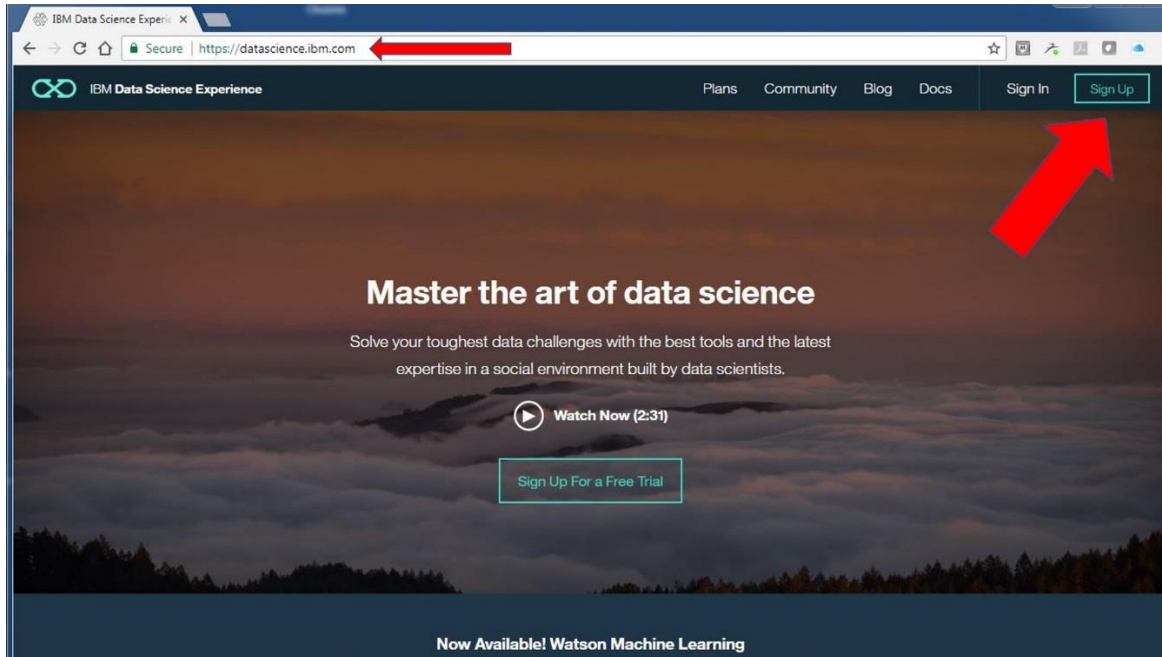


Lesson 1: Instructions

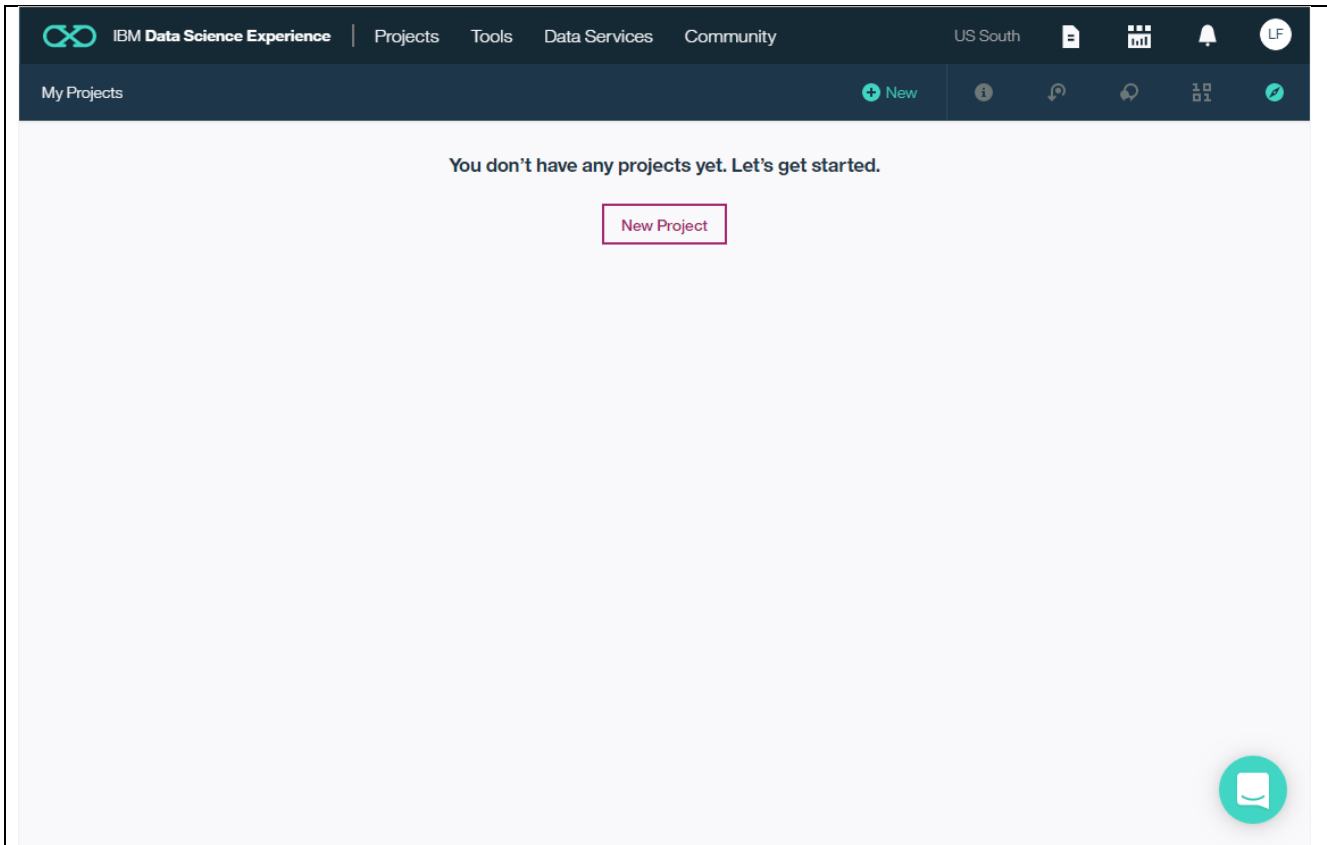
Action

1. Create Account/Sign In to DSX

- Open web browser and navigate to: <https://datascience.ibm.com>



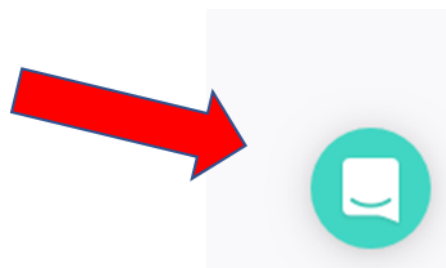
- Click on “Sign Up” and you will be prompted for several items of information. After a few moments of self-configuration, you will be brought to your new Home Page:

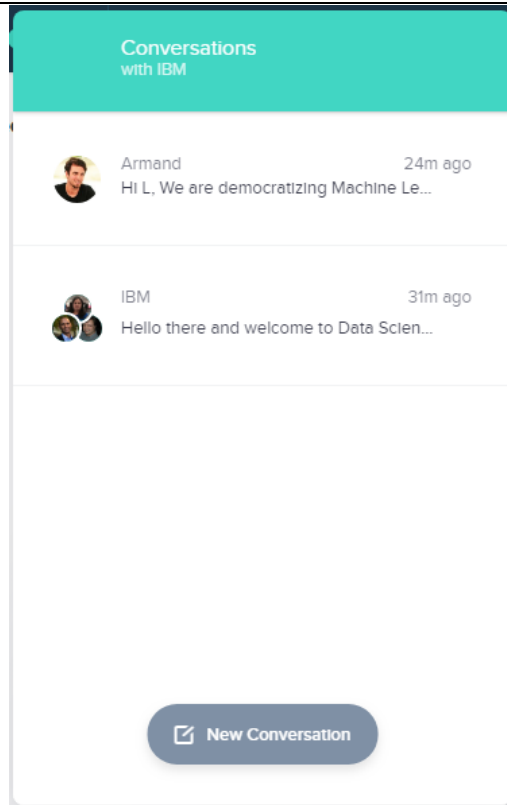


2. Live Chat

This is the home page of IBM Data Science Experience(DSX). Here you have all the tools that you need in a single place to **Learn, Create, and Collaborate**.

- On the bottom right-hand corner, you will see a **Live Chat** feature. Click on the **Chat** icon to launch Live Chat:





If you need assistance, you need only click on [New Conversation](#) to connect with a live person. Through this Live Chat feature, you can also continue conversations the next time you log into DSX.

We use feedback captured through [Live Chat](#) and the offerings instrumentation to guide our decisions in designing and developing [Data Science Experience](#). We perform this analysis using DSX.

3. Community Cards

At the top of the Home Page click on [Community Cards](#):

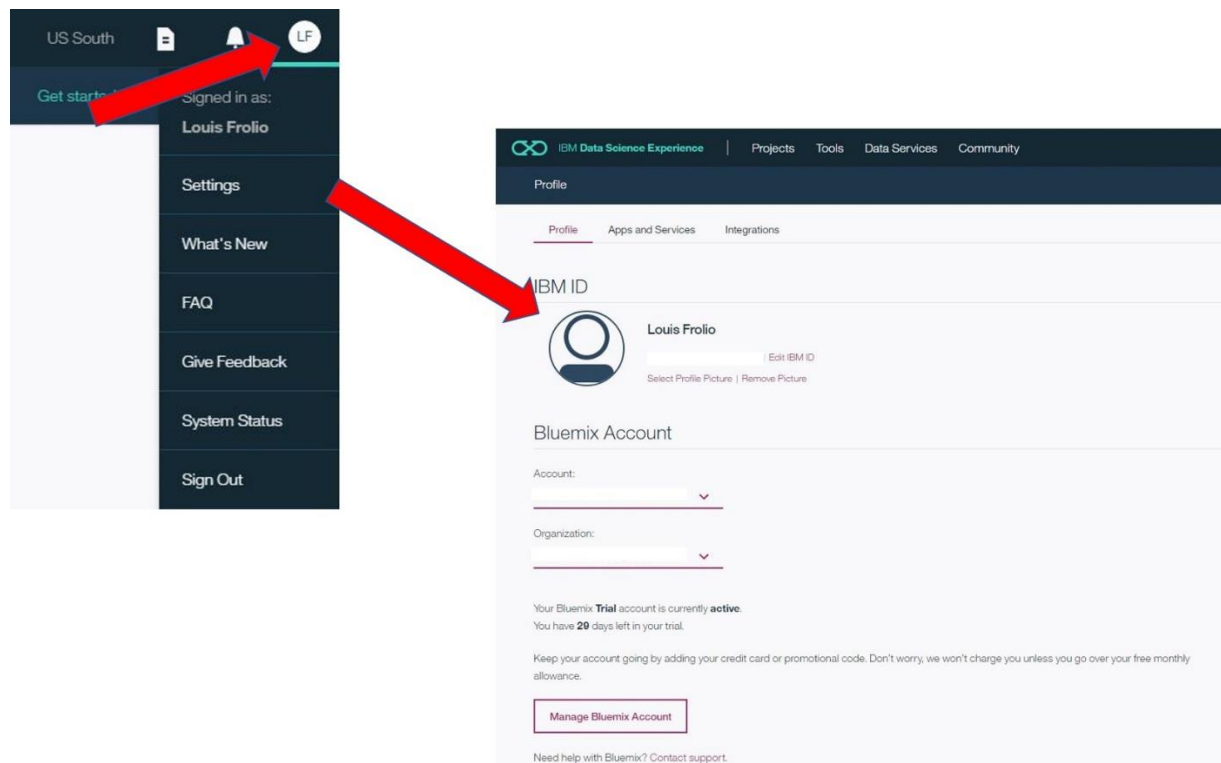
New in the community



There are four types of cards – **Articles, Data Sets, Notebooks, and Tutorials**. These are designed to make it easier for you to learn about data science and experiment with its various tools and techniques.

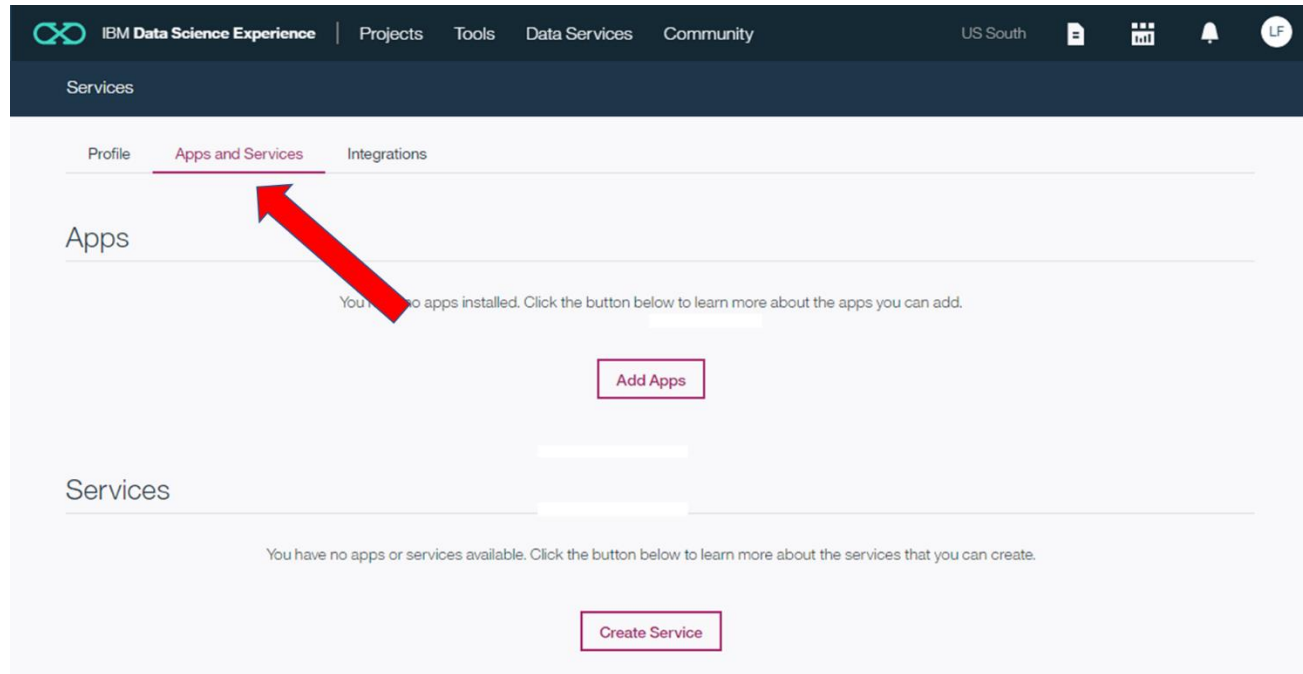
4. Profile Settings

- Click on **Settings** to look at your **Profile, Apps and Services, and Integrations**. This is where you see the details of your Bluemix Account:



5. Apps and Services

- Click on [Apps and Services](#) to view all your current IBM Cloud Apps and Services:



Above is the default for the brand-new account, there are no services or apps deployed.

[Integrations](#) is where you configure DSX for GitHub integration.

End of Lesson 1

Lesson 2: Jupyter Notebook

Purpose:	This lesson introduces projects within DSX, their purpose, value, and how they are used to support collaboration. Also, Jupyter notebooks are introduced and used as part of a customer churn analysis using the R programming language.
Tasks:	<p>Tasks you will complete in this lab exercise include:</p> <ul style="list-style-type: none">• Create and Configure DSX Project• Add Notebook Asset• Add Data Asset• Create Notebook Reference to Data Asset• Predict Customer Churn using Machine Learning Techniques• Evaluate Model Performance

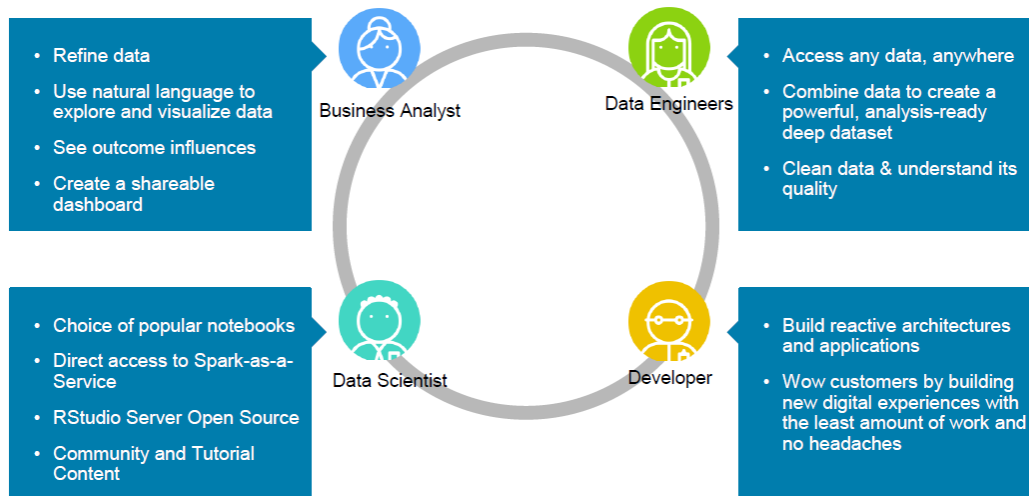
Lesson 2: Workflow Overview

- 1 • Project Overview
- 2 • Create New Project
- 3 • Create Notebook
- 4 • Load Data
- 5 • Bind Notebook to Data Asset
- 6 • Build and Evaluate Customer Churn Model

Lesson 2: Instructions

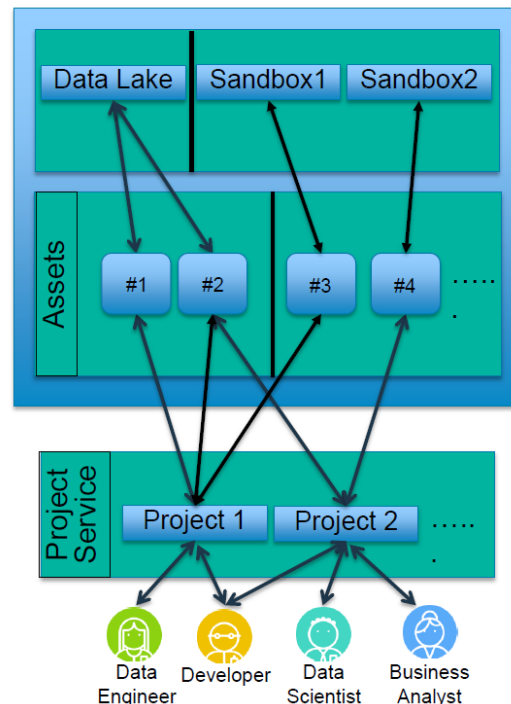
1. Project Overview

Data professionals need purpose-built, self-service communities that enable them to seamlessly collaborate across personas.



Projects make collaboration easier by:

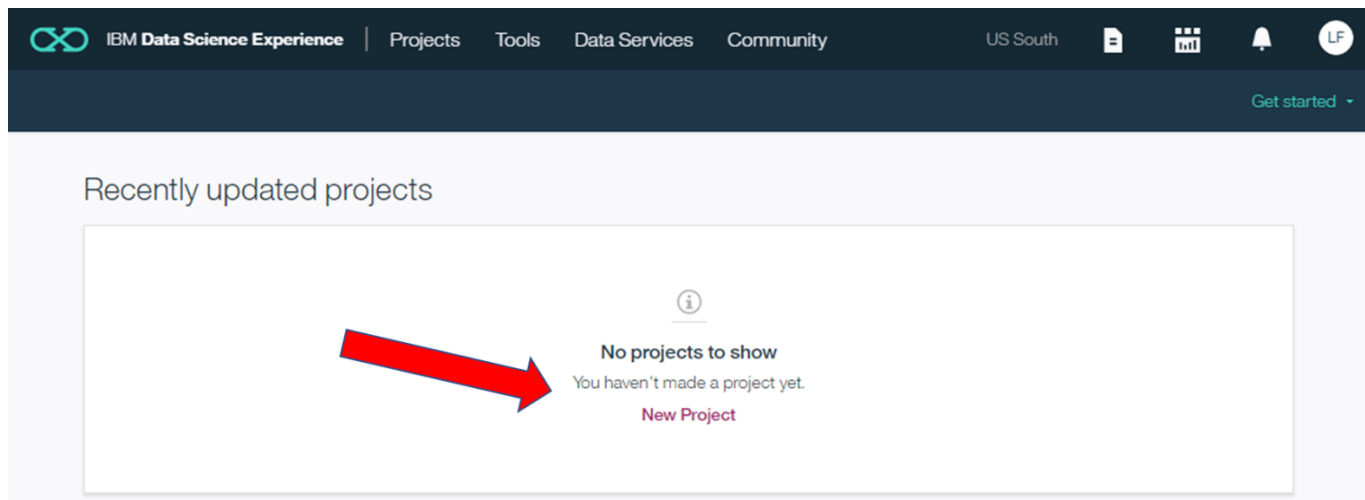
- Allowing different users and personas to share a set of assets
- Enabling users to collaborate and manage their notebooks, artifacts, plus more
- Providing three levels of rights: Viewers, Editors, and Admins



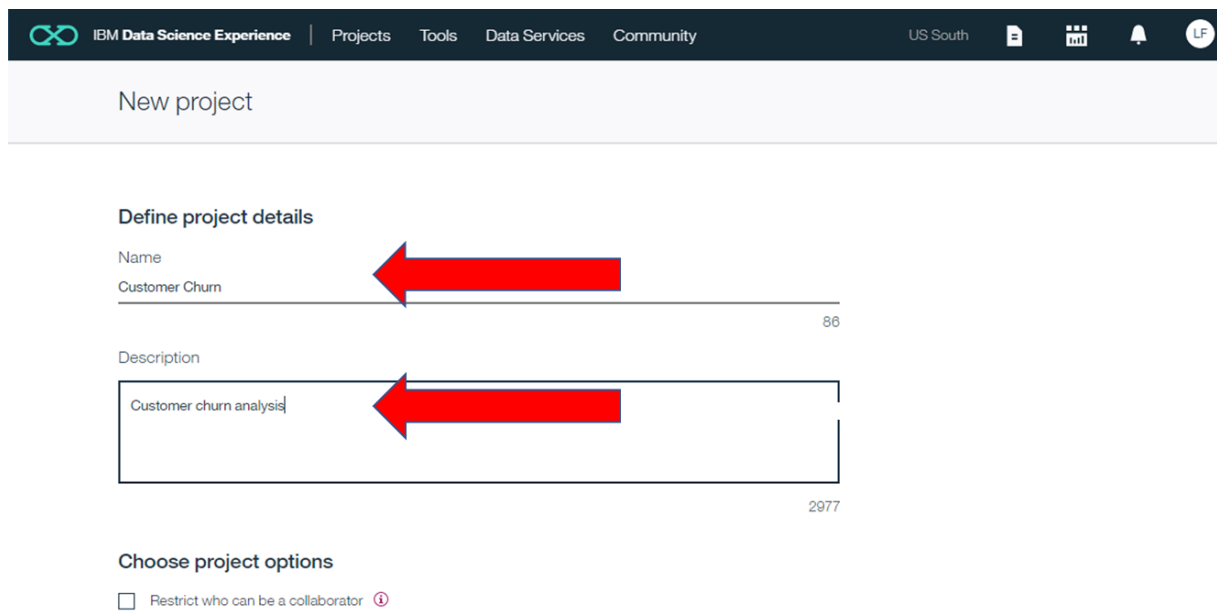
Action

2. Create New Project

- Navigate to <https://datascience.ibm.com>
- Login to DSX
- On the top right side, click **Create New and select project**



- Type the Project Name **Customer Churn**, add a meaningful description:



Action

Define Storage:

- Select **Object IBM Cloud Storage**
- Click Add
- Choose “Lite” plan then “Create”
- Verify your options then “Confirm”

Define Compute Engine:

- Under “Select Spark Service” click on “Add”
- Choose “Lite” plan then “Create”
- Verify your options then “Confirm”

Define storage



Select storage type



Object Storage (Swift API)



IBM Cloud Object Storage

Target Cloud Object Storage Instance

cloud-object-storage-eg



Define compute engine



Select Spark service

Spark service

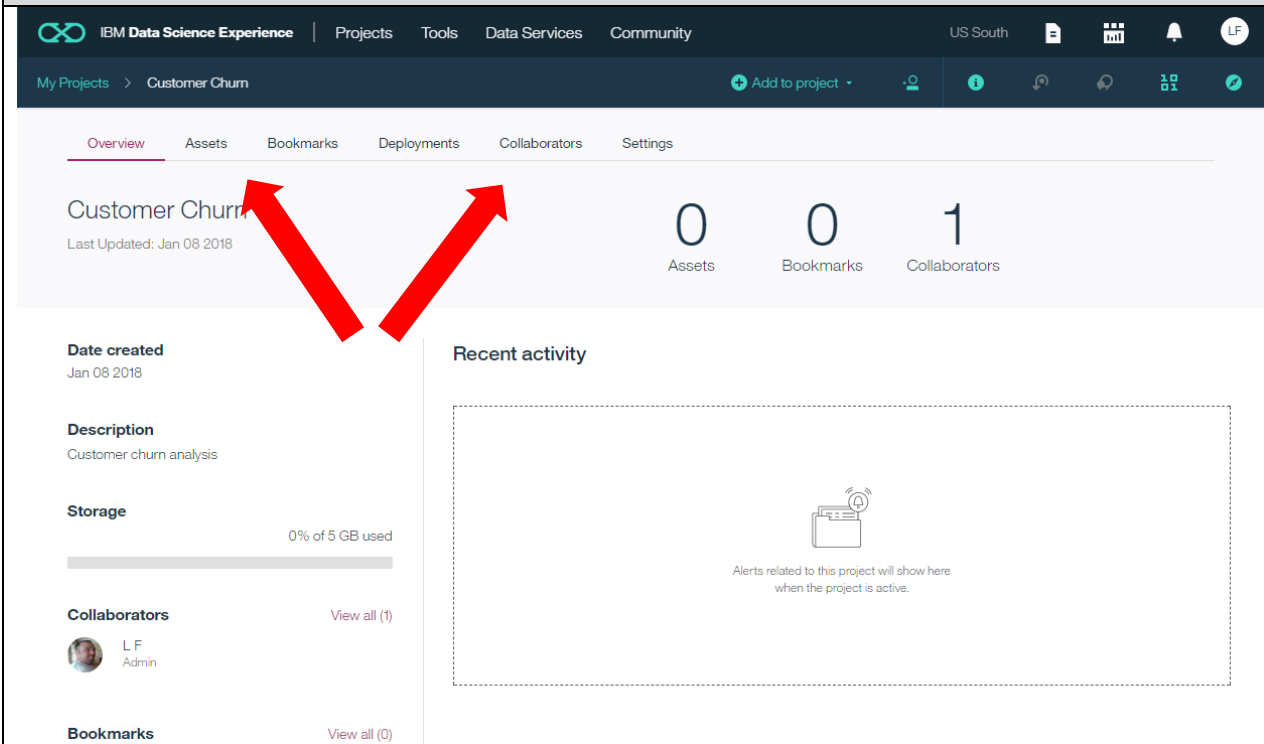
Spark-wn



If you associate the same Spark service with multiple projects, the Spark history server will display job history information for all the projects.

- Click **Create**

Action



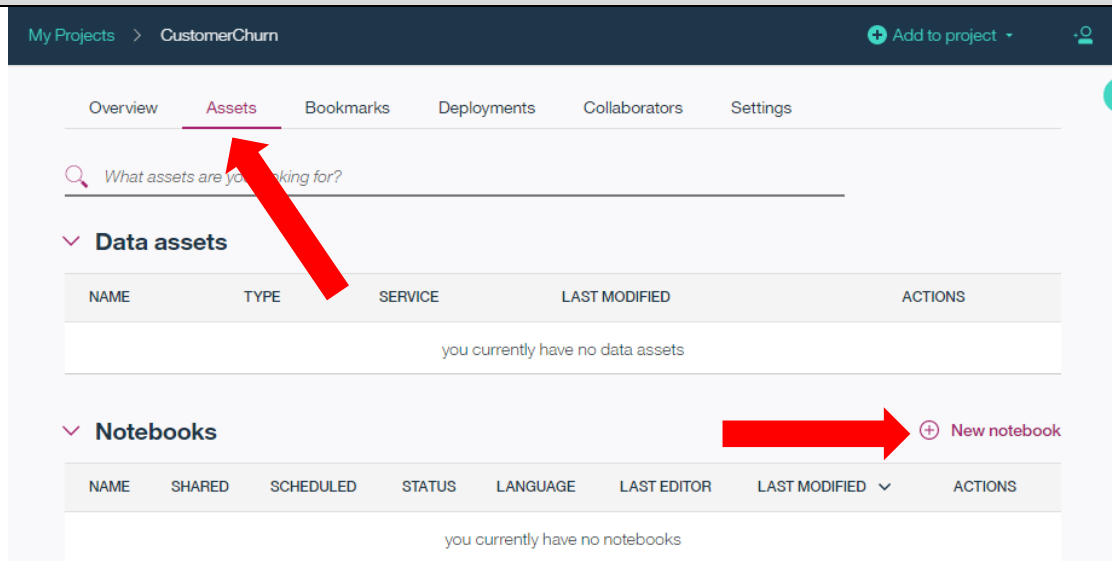
The screenshot shows the IBM Data Science Experience interface. At the top, there's a navigation bar with 'IBM Data Science Experience' and links to 'Projects', 'Tools', 'Data Services', and 'Community'. The user is logged in as 'LF' in the 'US South' region. Below the navigation bar, the 'My Projects' section shows a project named 'Customer Churn' with a 'Last Updated' date of 'Jan 08 2018'. The project is currently in the 'Overview' tab, with other tabs for 'Assets', 'Bookmarks', 'Deployments', 'Collaborators', and 'Settings'. The project details show 0 Assets, 0 Bookmarks, and 1 Collaborator. The 'Recent activity' section is empty, with a message: 'Alerts related to this project will show here when the project is active.' Two red arrows point from the 'Assets' and 'Collaborators' tabs to the project details section.

You now have a **Project** that is empty. You can use the tabs along the top to **add assets** to your project such as Connections, Notebooks, Data Assets, etc. You can also **add collaborators** to the Project.

3. Create Notebook

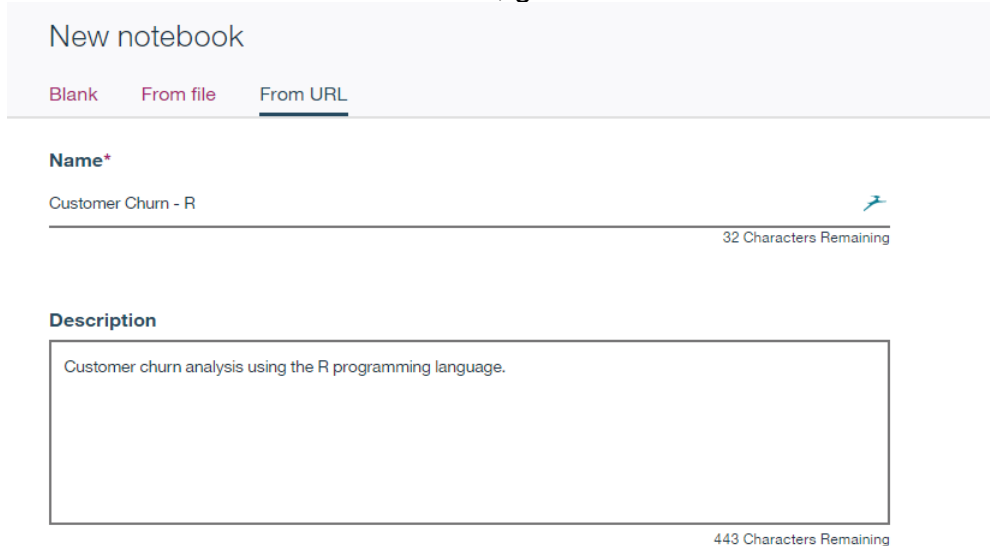
- Click **Assets**, then **Add Notebooks**

Action



The screenshot shows the 'CustomerChurn' project page. The 'Assets' tab is selected, and a red arrow points to the search bar. Below the search bar, there are sections for 'Data assets' and 'Notebooks'. The 'Notebooks' section has a red arrow pointing to the '+ New notebook' button.

- Choose **From URL** from the tab, give the notebook a name and meaningful description:



The 'New notebook' form is shown with the 'From URL' tab selected. The 'Name' field contains 'Customer Churn - R' and the 'Description' field contains 'Customer churn analysis using the R programming language.'.

- In a separate browser window navigate to: [Predicting Customer Churn with Watson Data Platform](#)
- Click on Notebooks, right click on **CustomerChurn-R.ipynb** then choose **Copy link address**. Go back to the **DSX New Notebook** page.

Action

Paste URL into **Notebook URL** text box then choose **Create Notebook**:

Notebook URL*

<https://github.com/team-wolfpack/DSX-Hands-on-Workshop/blob/master/Notebooks/CustomChurn-R.ipynb>

Spark service*

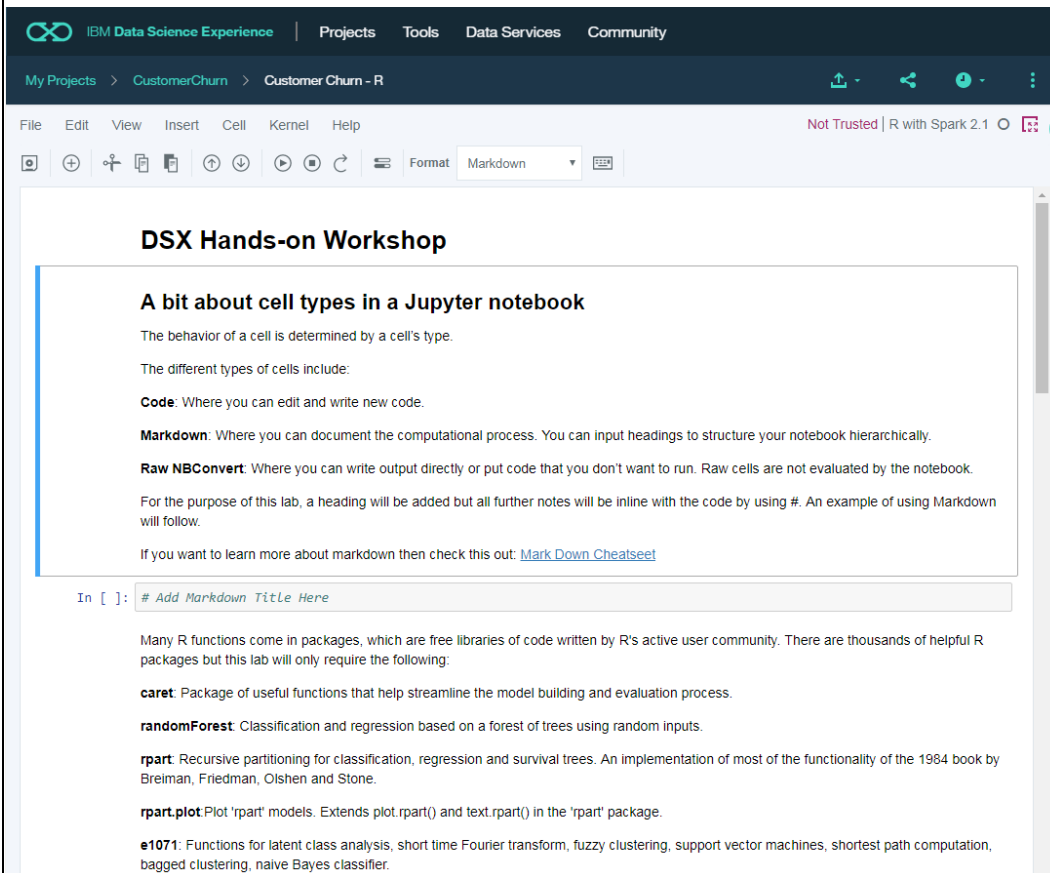
DSX-Spark

Associate this notebook with the Spark Service of your choice.

Cancel

Create Notebook

You should now see something like this:



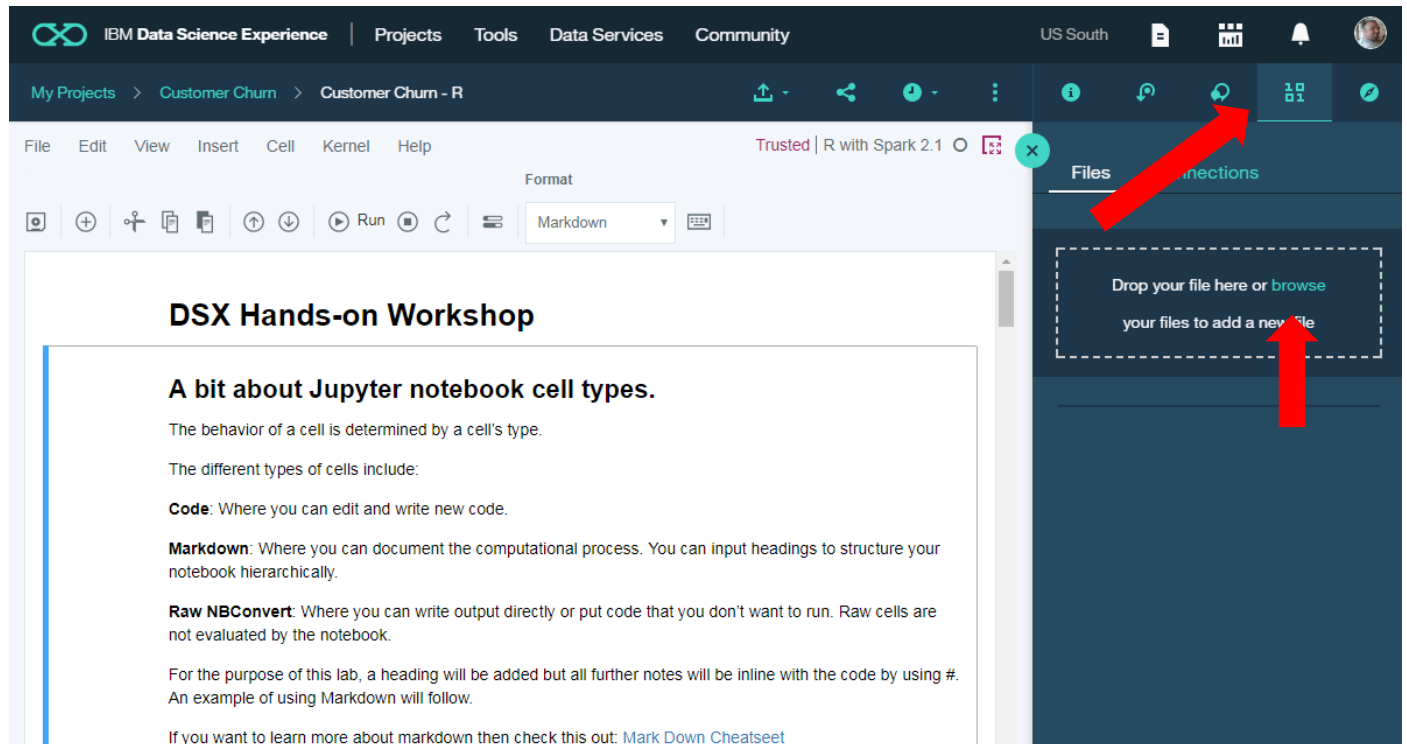
The screenshot shows the IBM Data Science Experience Jupyter Notebook interface. The top navigation bar includes 'My Projects', 'CustomerChurn', and 'Customer Churn - R'. The notebook title is 'DSX Hands-on Workshop'. The content area displays a document with the following sections:

- A bit about cell types in a Jupyter notebook**
 - The behavior of a cell is determined by a cell's type.
 - The different types of cells include:
 - Code:** Where you can edit and write new code.
 - Markdown:** Where you can document the computational process. You can input headings to structure your notebook hierarchically.
 - Raw NBConvert:** Where you can write output directly or put code that you don't want to run. Raw cells are not evaluated by the notebook.
 - For the purpose of this lab, a heading will be added but all further notes will be inline with the code by using #. An example of using Markdown will follow.
 - If you want to learn more about markdown then check this out: [Mark Down Cheatseeit](#)
- In []:** # Add Markdown Title Here
- Many R functions come in packages, which are free libraries of code written by R's active user community. There are thousands of helpful R packages but this lab will only require the following:
 - caret:** Package of useful functions that help streamline the model building and evaluation process.
 - randomForest:** Classification and regression based on a forest of trees using random inputs.
 - rpart:** Recursive partitioning for classification, regression and survival trees. An implementation of most of the functionality of the 1984 book by Breiman, Friedman, Olshen and Stone.
 - rpart.plot:** Plot 'rpart' models. Extends plot.rpart() and text.rpart() in the 'rpart' package.
 - e1071:** Functions for latent class analysis, short time Fourier transform, fuzzy clustering, support vector machines, shortest path computation, bagged clustering, naive Bayes classifier.

4. Load Data

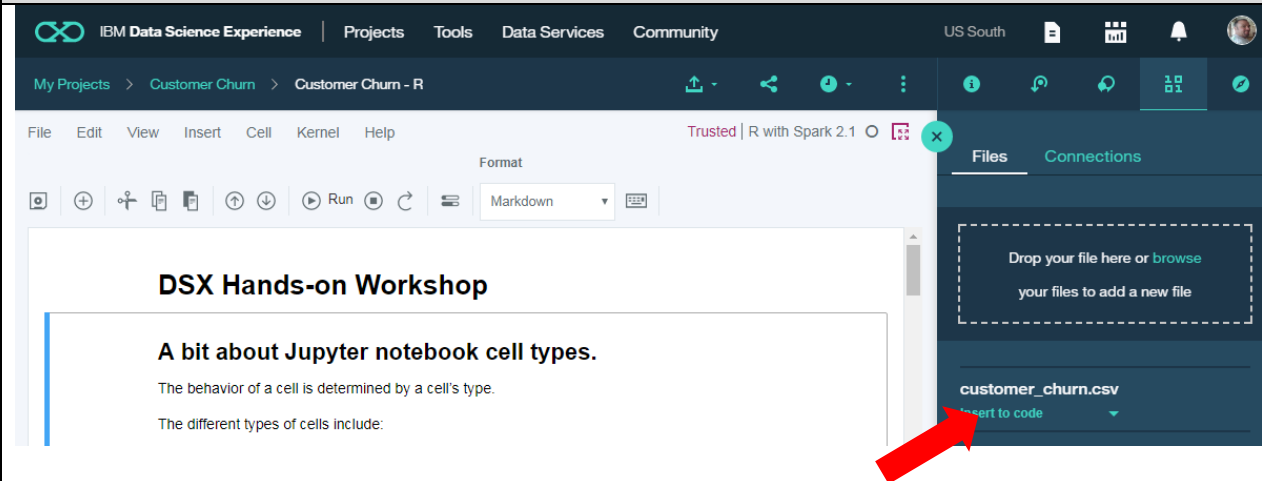
Action

- In a separate browser navigate to: [Customer Churn Data](#)
- Download file, unzip and place customer_churn.csv in a folder on your computer.
- Go back to the CustomerChurn-R notebook and then click on the Data icon at the top right of the screen:



A new panel will be presented with Files highlighted. Click on browse, navigate to the customer_churn.csv file and select it. You should now see that the file has been imported into the project:

Action



5. Bind Notebook to Data Asset

Although the data is part of the project, the notebook has no reference to it. Let's now add a reference so that we can analyze the data.

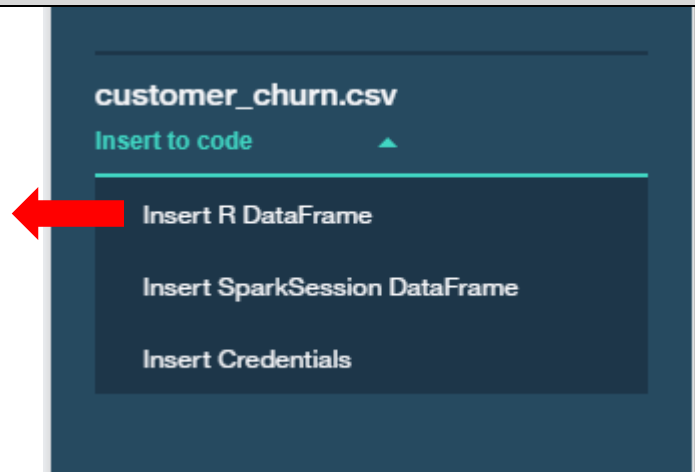
- In the notebook scroll down to “**Cloud Object Storage Connectivity**”:

Cloud Object Storage Connectivity

```
In [ ]: # Placeholder for R Data Frame Auto-code
        # custDataRaw
        |
```

- Place the cursor in the cell and beneath the comment. Navigate the side panel where the data set is displayed, click on “insert into code”:

Action



- Choose “Insert R DataFrame” to insert auto-generated code that will allow the notebook to access the data stored on Bluemix:

```
In [ ]: # Placeholder for R Data Frame Auto-code
# @hidden_cell
# This function accesses a file in your Object Storage. The definition contains your credentials.
# You might want to remove those credentials before you share your notebook.
getObjectStorageFileWithCredentials_d5fa59dc7e72461489ab1f8be43ed5a0 <- function(container, filename) {
  # This functions returns a textConnection object for a file
  # from Bluemix Object Storage.

  if(!require(httr)) install.packages('httr')
  if(!require(RCurl)) install.packages('RCurl')
  library(httr, RCurl)
  auth_url <- paste("https://identity.open.softlayer.com", '/v3/auth/tokens', sep= '')
  auth_args <- paste('f"auth": f"identity": f"password": f"user": f"domain": f"id": f"26746425a3a44h7383a'
```

Look at the last line of the newly inserted data frame, particularly the name assigned to it:

```
df.data.1 <- read.csv(file = getObjectStorageFileWithCred
head(df.data.1)
```

Let's make it friendlier. Change “df.data.1” to “custDataRow.”

```
custDataRow <- read.csv(file = getObjectStorage
head(custDataRow)
```

6. Build and Evaluate Customer Churn Model

Lesson 2 Continued in [Customer Churn – R] Notebook

Lesson 3: Machine Learning Flows

Purpose:	This lesson introduces Machine Learning Flows in DSX. Flows provide a graphical approach to machine learning like that of SPSS Modeler.
Tasks:	<p>Tasks you will complete in this lab exercise include:</p> <ul style="list-style-type: none">• Create Machine Learning Flow• Import Data• Leverage Flows' Palette to Orchestrate Customer Churn Machine Learning Pipeline• Evaluate Customer Churn Model

Lesson 3: Workflow Overview

- 1 • Create Machine Learning Flow
- 2 • Add Data Asset
- 3 • Add & Configure Type Object
- 4 • Add & Configure Model Objects
- 5 • Run Flow to Create Nuggets
- 6 • Add & Configure Analysis Object - Measure Performance
- 7 • Add Second Model Technique to Flow

Lesson 3: Instructions

Action

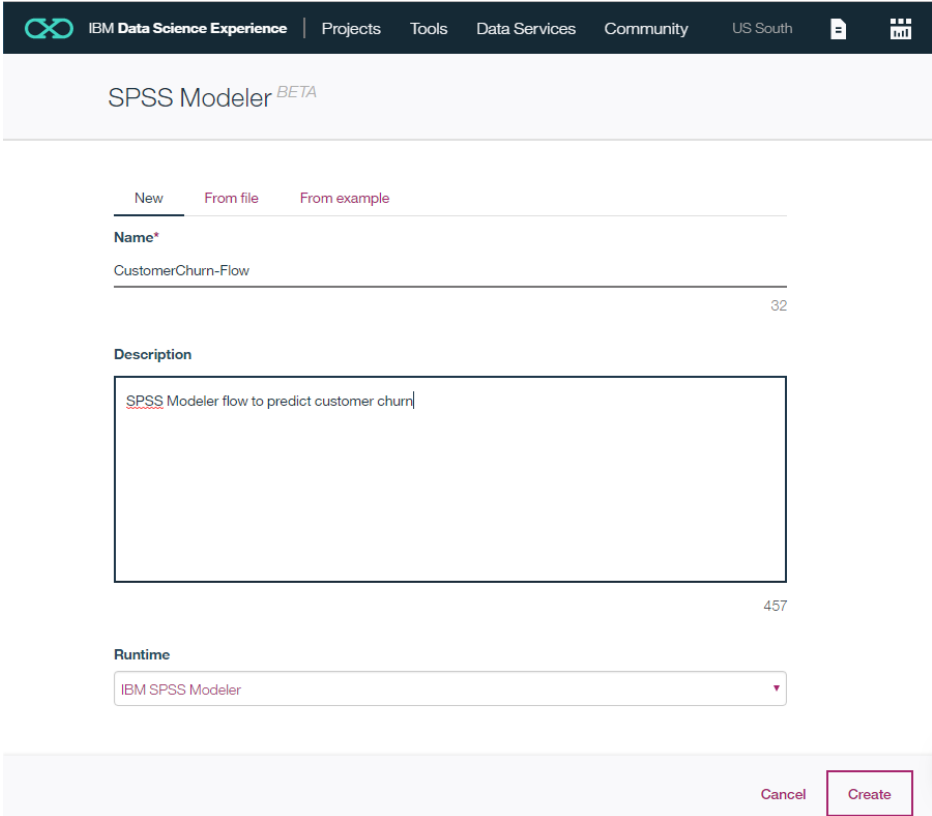
1. Create Machine Learning Flow

- Navigate to CustomerChurn project page
- Scroll down to **SPSS Modeler flows** then click on “**New flow**”

▼ **SPSS Modeler flows** + New flow

NAME	CREATED BY	LAST MODIFIED	ACTIONS
you currently have no spss modeler flows			

- Choose “New” on the top menu. Give the flow a meaningful name and description. For “Runtime” choose “**IBM SPSS Modeler**”:



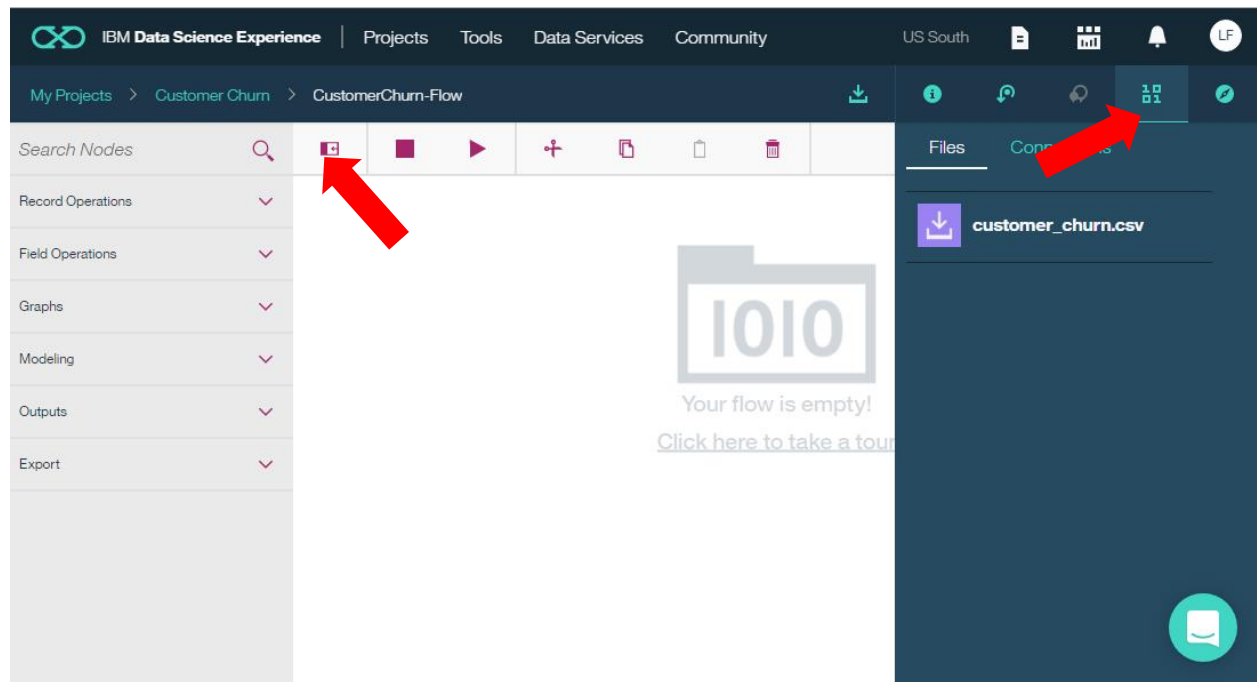
Action

Click on “Create”

2. Add Data Asset

You should now see an empty workspace.

- On the top left click on the “Palette” icon, and on the top right click on the “Find and Add Data” icon.



The palette represents the set of tools available for use with DSX flows. The menu of the right should look familiar.

- Let’s start by dragging and dropping the “**customer_churn.csv**” file onto the workspace.

3. Add & Configure Type Object

- From the palette, expand “**Field Operations**”, then drag and drop “**Type**” onto the workspace and to the right of “customer_churn.csv”. Connect the two objects:

Action



- Double click on “Type”, click on “**Add Columns**” then add all the columns. Click on the arrow back to the “Settings” page of the “Type” object. For the “CHURN” column, change its Role to that of “**Target.**” Leave the default for the remaining columns:

Type

Settings
Annotations

Default mode
☒ Read metadata
☐ Pass (do not scan)

Types

Add Columns

Field^	Measure^	Role^	Value mode^	Values^	Check^
ID	Default	Input	Read		None
CHURN	Default	Target	Read		None
Gender	Default	Input	Read		None
Status	Default	Input	Read		None
Children	Default	Input	Read		None

Cancel
OK

- Click “OK” to exit.

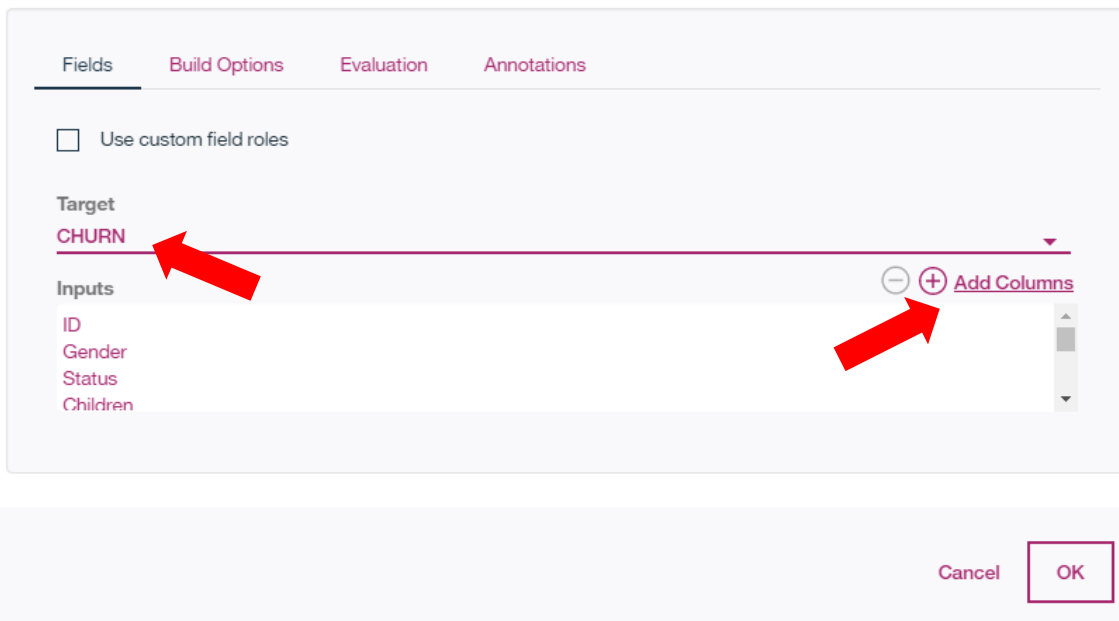
Action

4. Add & Configure Model Object

- From the palette, expand the “**Modeling**” branch then drag “**C&R Tree**” onto the workspace to the right of “Type.”
- Connect the two then double click on “C&R Tree” to edit its properties.

The “Target” should identify “CHURN” automatically:

CHURN



Fields Build Options Evaluation Annotations

☐ Use custom field roles

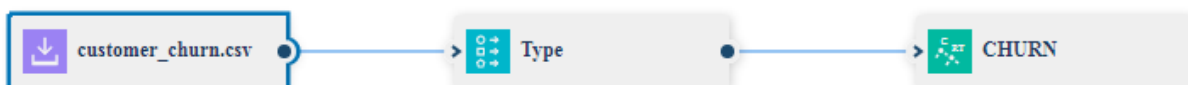
Target
CHURN

Inputs
ID
Gender
Status
Children

− + Add Columns

Cancel OK

- Click on “Add Columns.” Recall from the notebook exercise you were asked to jot down the top 10 fields that were identified as the greatest influencers. Choose those columns as inputs to the decision tree model. Click “OK” to return to the workspace:

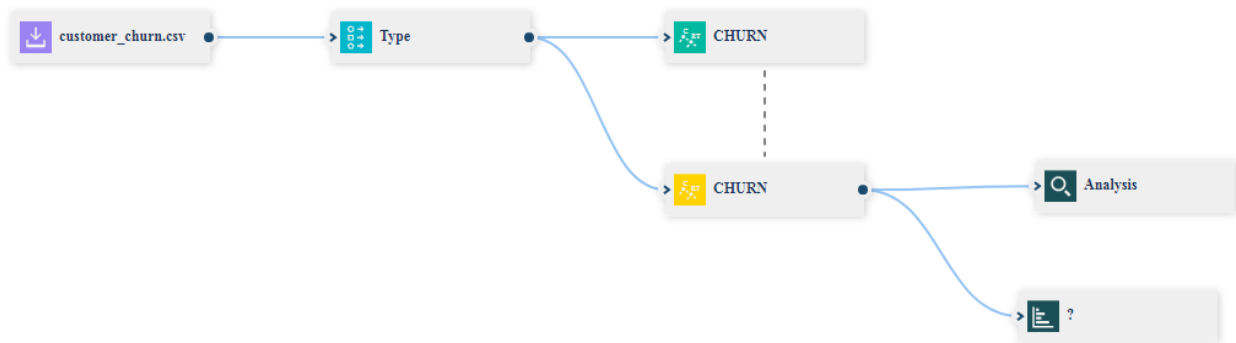


5. Run Flow to Create Nugget

- Run the flow by clicking on the “Run” icon at the top of the workspace.

You should see a new forth object on the workspace, this is called a nugget.

- From the palette add an “**Analysis**” object to the workspace, you will find it under the “Outputs” drop down. Also, from the “**Graphs**” drop down add a “**Distribution**” object to the workspace. Connect the nugget to each of them:



6. Add & Configure Analysis Object – Measure Model Performance

- Double click on “**Analysis**” and check off the four checkboxes, leave the rest as default:

Analysis

Settings

Output

Annotations

☒ Coincidence matrices (for symbolic targets)
 ☐ Performance evaluation
 ☐ Evaluation metric (AUC & Gini, binary classifiers only)
 ☐ Confidence figures (if available)

Threshold for pot. correct
 90

Improve accuracy multiplier
 2

Find predicted/predictor fields using

☒ Model output field metadata
 ☐ Field name format (for example, '\$<x>--<target field>')

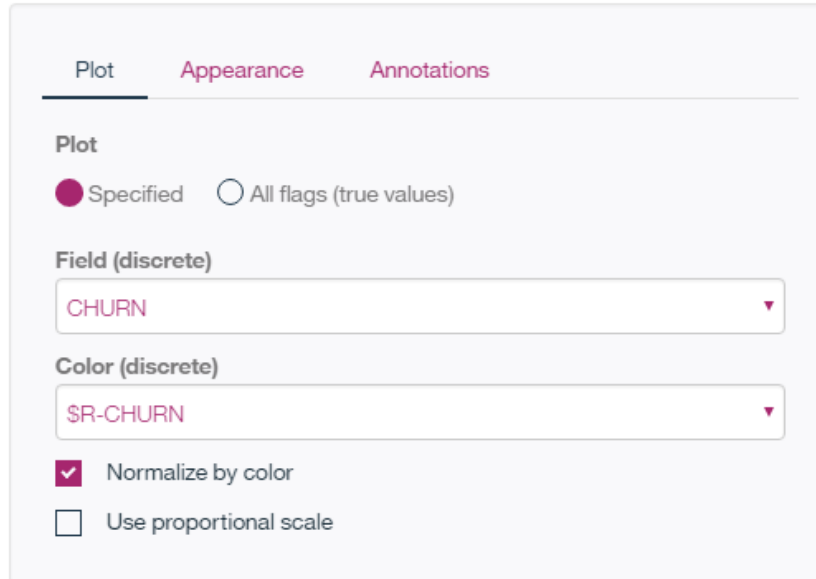
☒ Separate by partition

Break down analysis by fields

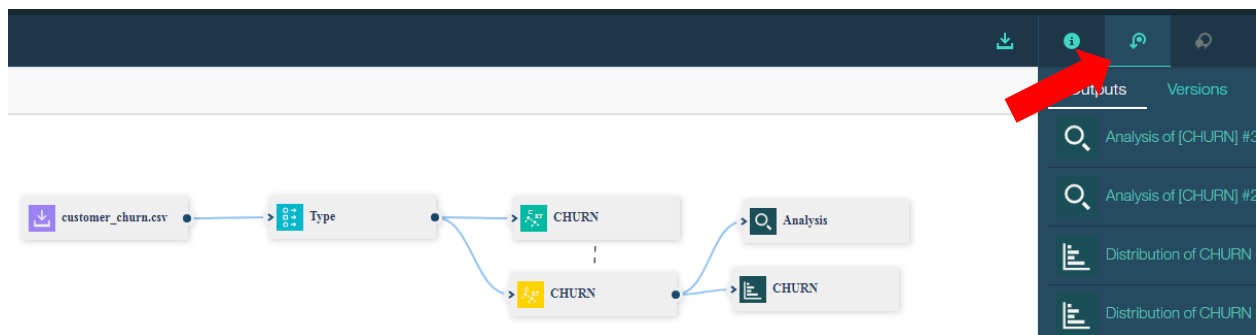
ID
 CHURN
 Gender
 Status

- Click “OK” to return to the workspace.
- Double click on “Plot” and configure it as depicted below:

?



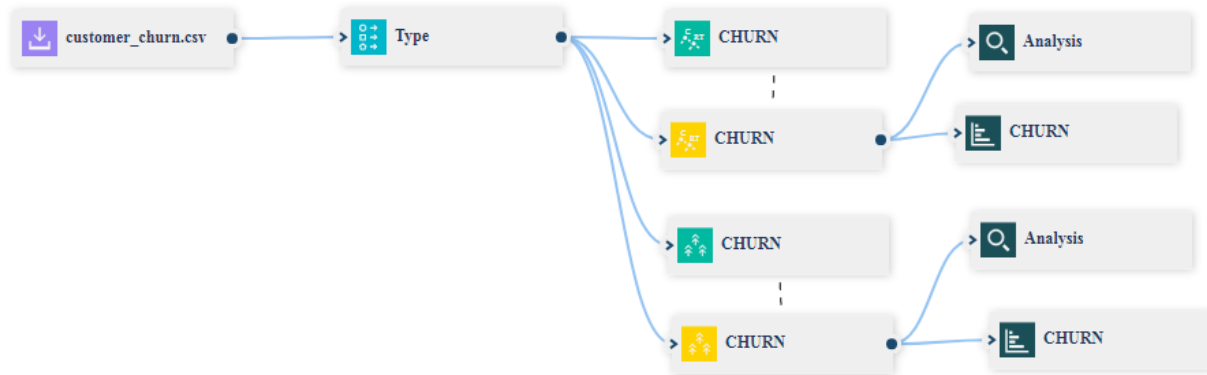
- Click on “OK” to return to the workspace.
- Run the flow again.
- On the right side of the workspace click on the “**Outputs and Versions**” icon to see the resulting analysis:



- Explore the results

7. Add Second Modeling Technique to Flow

- To the palette repeat the process for “**Random Trees**” that you did for “C&R Trees.” Your resulting workspace should look like the following:



- Explore the results.

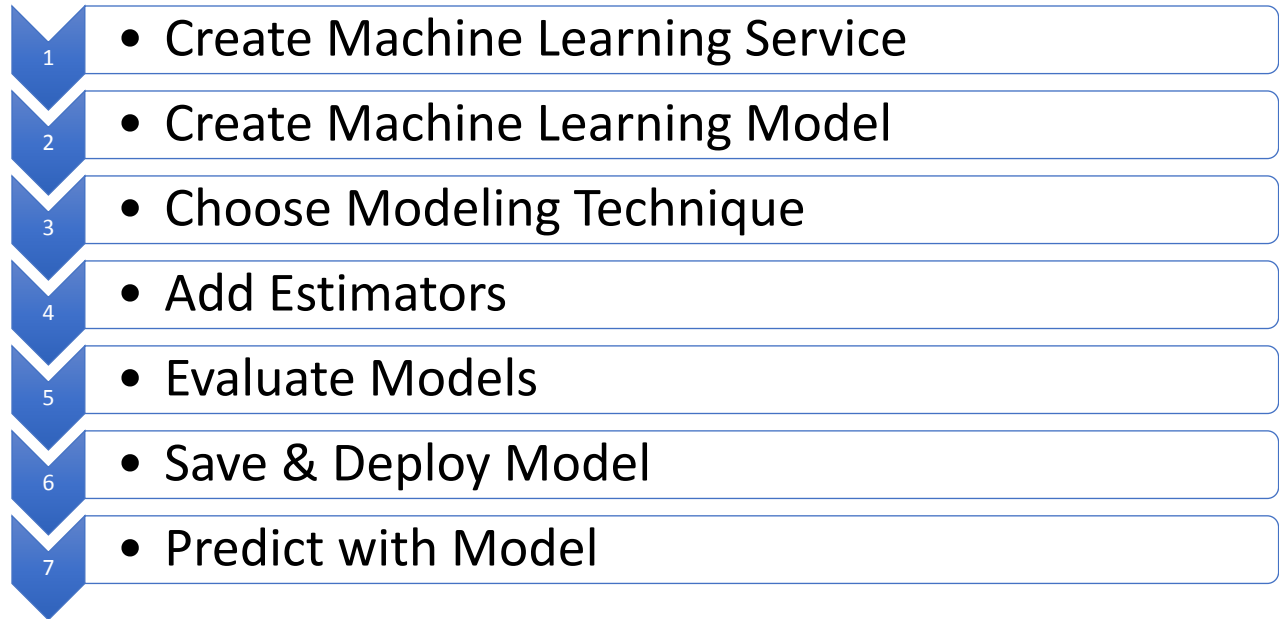
End of Lesson 3



Lesson 4: Watson Machine Learning

Purpose:	This lab introduces Watson Machine Learning in DSX. Watson Machine Learning makes the task of machine learning easy with as little as a few clicks of the mouse.
Tasks:	<p>Tasks you will complete in this lab exercise include:</p> <ul style="list-style-type: none">• Creation of requisite services to support Watson Machine Learning• Creation of Watson Machine Learning Models• Model Performance Evaluation• Deployment and Prediction of Model

Lesson 4: Workflow Overview

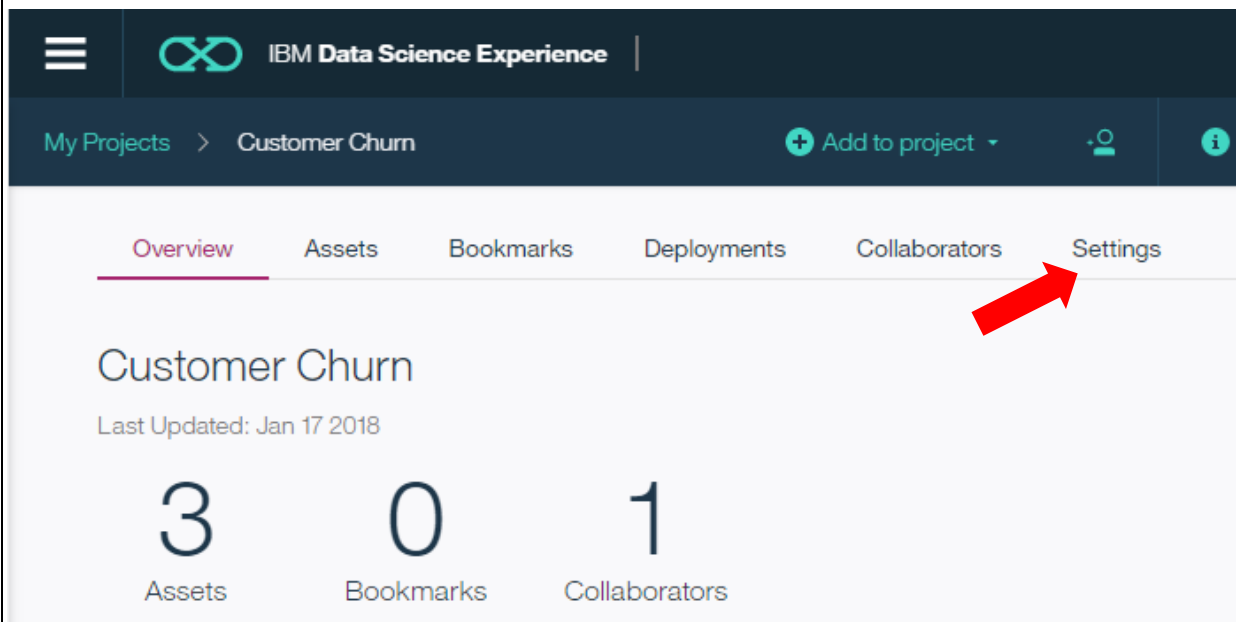


Lesson 4: Instructions

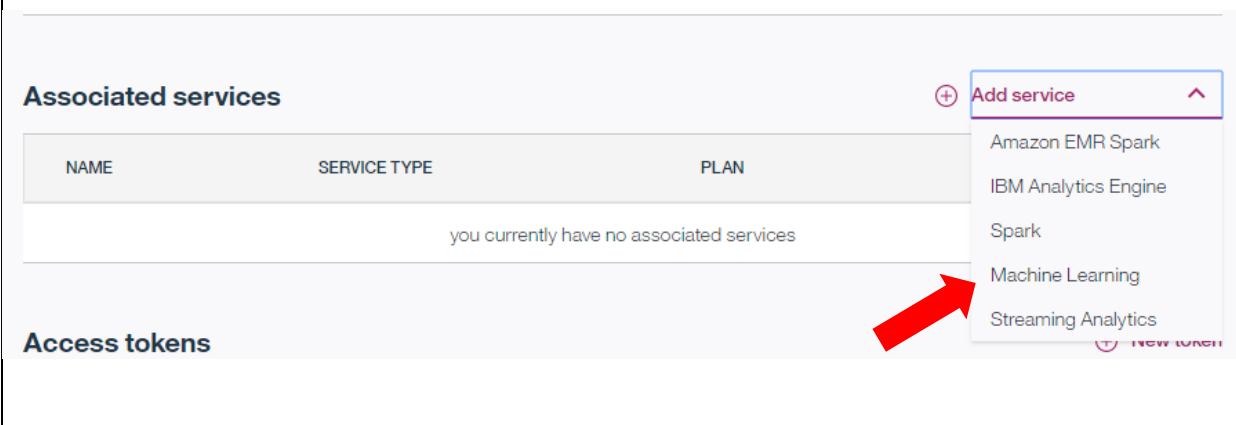
Action

1. Create Machine Learning Service

- Navigate to CustomerChurn project page
- At the top click on the “Settings” icon:



Scroll to the middle of the page and click on “Add service” then choose “Machine Learning”:



Action

- On the Machine Learning page make sure that the tab is set to “New”, for the plan choose “Lite”:

Machine Learning

Existing
New

Machine Learning

IBM Watson Machine Learning is a full-service Bluemix 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

SPSS analytics platform features

SPSS streams management and deployment with realtime scoring and batch processing options.

Integration with Data Science Experience

Visit <http://datascience.ibm.com>. Create and train predictive analytics models with the best tools and the latest expertise in a social environment built by data scientists.

Spark and Python Machine Learning features

Take advantage of Spark MLlib and scikit-learn machine learning models management and deployment - online, batch and streaming.

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

Plan	Features	Pricing
<div> <div></div> Lite </div>	Service instance (5 models per instance) 5,000 predictions 5 compute hours	Free

- Click on “**Create**”
- At the confirmation page you can give your service a meaningful name:

Confirm Creation

Organization: louisfrolio@gmail.com

Plan
 Lite

Space
 dev

Service name
 dsx-wml-lab

Cancel Confirm

- Click “Confirm” to create Watson Machine Learning Service.

2. Create Machine Learning Model

- In the Project click on “**Assets**” at the top of the window.
- In the middle of the page you will see “**Models**”, click on “New model”:

Models

New model

NAME	STATUS	RUNTIME	LAST MODIFIED	ACTIONS
you currently have no models				

- In the “New model” window give your model a meaningful name and description, you should also see the machine learning service you just created. Click on “**Manual**” then “**Create**”:

New model BETA

Define model details

Name
CustomerChurn-WML

Description
Customer churn using Watson Machine Learning

Machine Learning Service
dsx-wml-lab

Select model type

☒ Model builder
☐ From sample

Spark Service
Spark-wm

Automatic
Prepare my data and create a model automatically

Manual
Let me prepare my data and select which models to train

Need something more flexible? Create a **notebook** or design an **SPSS Modeler flow**.

Cancel Create

- When complete you will be prompted for a data asset, choose “customer_churn.csv”, then click “Next.”

Select data asset

The model builder currently supports CSV files and IBM Db2 Warehouse on Cloud data assets.

What asset are you looking for?

NAME	TYPE	SERVICE
  customer_churn.csv	Data Asset	Project

3. Choose Modeling Technique

- At the “**Select a Technique**” screen select “**CHURN**” as the “**Column value to predict**”, and for the feature columns choose 5 -9 identified in the Jupyter notebook lab. Also, make sure “**Binary Classification**” is highlighted:


Select a technique

Column value to predict (Label Col)

CHURN (String) ▼


Feature columns

Gender (String), Status (String), Children (Integer), Est Income (Decimal), Car Owner (String), Paymethod (String), LongDistanceBilltype (String), Usage (Decimal), RatePlan (Integer) ⓧ ▼




Binary Classification

Classify new data into defined categories based on existing data. Choose if your label column contains two distinct categories.



Multiclass Classification

Classify new data into defined categories based on existing data. Choose if your label column contains a discrete number of categories.



Regression

Predict values from a continuous set of values. Choose if your label column contains a large number of values.

Validation Split

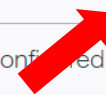
Train: 60

Test: 20

Holdout: 20

+ Add Estimators

Configured estimators




4. Add Estimators


- In the upper right-hand corner of the screen you will see “**Add Estimators**”, click on the icon. In the “Select estimator(s)” screen choose **Decision Tree Classifier**, and **Random Forest Classifier**:

Select estimator(s)


What type of estimator are you looking for?




Logistic Regression
Analyzes a data set in which there are one or more independent variables that determine one of two outcomes. Only binary L...



Decision Tree Classifier
Maps observations about an item (represented in the branches) to conclusions about the item's target value (represented in...



Random Forest Classifier
Constructs multiple decision trees to produce the label that is a mode of each decision tree. It supports both binary and ...



Gradient Boosted Tree Classifier
Produces a classification prediction model in the form of an ensemble of decision trees. It only supports binary labels, a...

- Click “Add”:

Select a technique


You cannot change label column, feature columns, model type, or validation split after adding an estimator.
You must first delete all estimators in order to make changes to these attributes.

Column value to predict (Label Col)


CHURN (String)

Feature columns


Est Income (Decimal), Age (Decimal), LongDistance (Decimal), Status (S



Binary Classification
Classify new data into defined categories based on existing data. Choose if your label column contains two distinct categories.



Multiclass Classification
Classify new data into defined categories based on existing data. Choose if your label column contains a discrete number of categories.




Regression
Predict values from a continuous set of values. Choose if your label column contains a large number of values.

Validation Split




+ Add Estimators

Configured estimators



Decision Tree Classifier
Not Yet Trained



Random Forest Classifier
Not Yet Trained

- Click “Next” to train models. This will take 1-2 minutes with the data set we are using:


5. Evaluate Models

Select model							
	ESTIMATOR TYPE	STATUS	PERFORMANCE	AREA UNDER ROC CURVE	AREA UNDER PR CURVE	LAST EVALUATION	ACTIONS
<input type="radio"/>	RandomForestClassifier	Trained & Evaluated	Excellent	0.94229	0.92568	17 Jan 2018, 10:42 AM	⋮
<input checked="" type="radio"/>	DecisionTreeClassifier	Trained & Evaluated	Good	0.87427	0.85758	17 Jan 2018, 10:42 AM	⋮

[Close](#)
[Previous](#)
[Save](#)

6. Save & Deploy Model

- Pick which model you want to keep then click “Save:”

CustomerChurn-WML 	
Overview	Evaluation
Deployments	Test
Summary	
Machine learning service	DSX-Lab-Machine_Learning
Runtime environment	spark-2.0
Training date	30 Oct 2017, 5:40 PM
Label column	CHURN
Latest version	15233fc3-28a0-485d-9f09-445bac5bcd11
Model builder details	View

The overview page provides useful information about the model. This includes the ability to deploy and predict with the model.

- Click on “Deployments” then “[Add Deployment](#)”:

CustomerChurn-WML

Overview Evaluation Deployments

NAME STATUS DEPLOYMENT TYPE ACTIONS			
Your model is not deployed.			

 Add Deployment

- For deployment type choose “**Web Service**” then give the deployment a useful name:

Create Deployment

Web Service Batch Prediction Real-time Streaming Predictions

Name

CustChurnRandForestDeployed

Description

Deployed Random Forests model to predict customer churn


245

7. Predict with Model

- Choose newly created deployed model:

CustomerChurn-WML

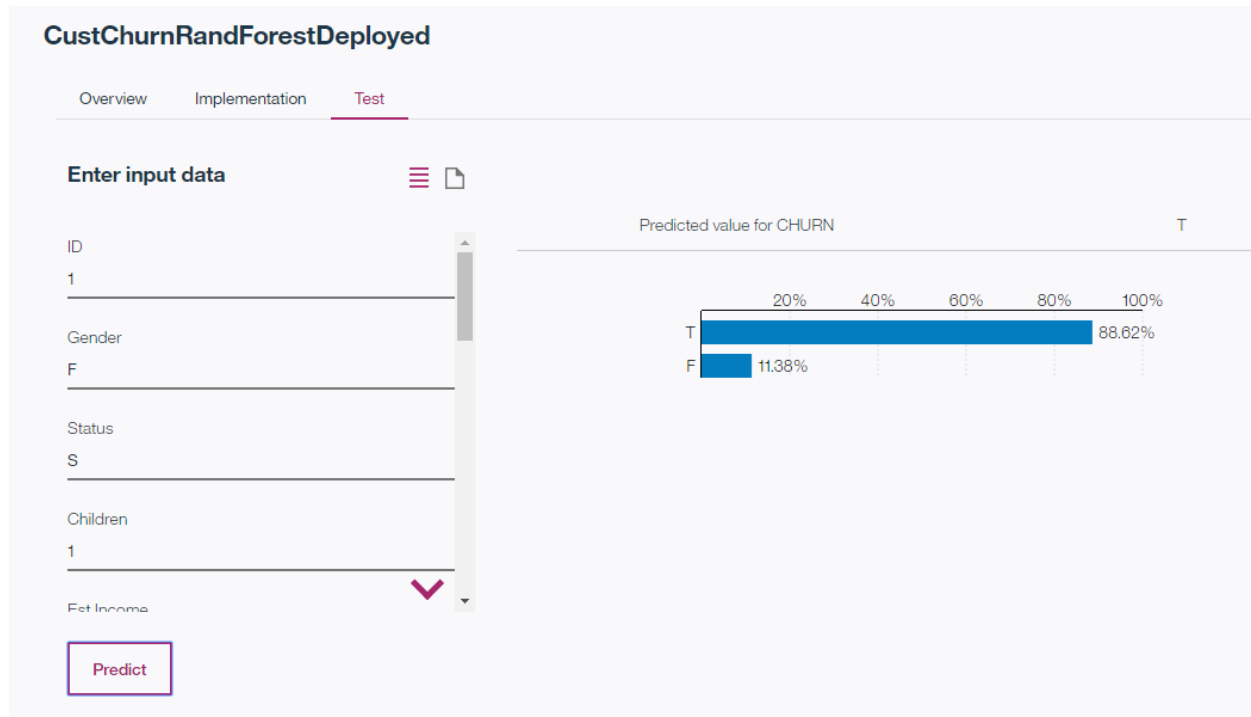
Overview Evaluation Deployments

NAME STATUS DEPLOYMENT TYPE ACTIONS			
CustChurnRandForestDeployed ACTIVE Web Service 			

 Add Deployment

- Click on “**Test**” to test the model.

The input features will be pre-populated, but you can change them to see different outcomes. Just be sure that the values you add are valid as per the data set. [See “Summary Statistics”](#) from the Jupyter notebook exercise:



End of Lesson 4

End of Hands-on Workshop

Thank You