Retrain ML

RETRAIN ML

Retrain ML

In this session

- Retrain workflow
- Create new training experiment
- Create/Publish predictive experiment
- Create/publish a retrain experiment (add IO)
- Create C# console Application BES
- Get keys from Azure Storage Account
- Update C# code input/output
- Get iLearner information
- Review retrain evaluation
- Add a new Endpoint
- Update endpoint

Retrain ML

Retrain workflow

Create the initial Predictive Web service:

- Create a training experiment
- Create a predictive web experiment
- Deploy a predictive web service

Retrain the Web service:

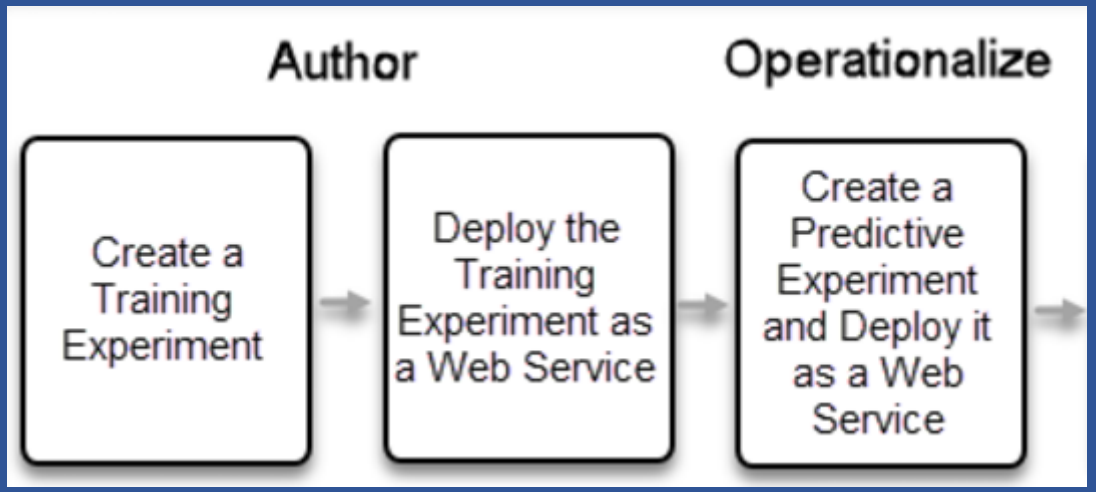
- Update training experiment to allow for retraining
- Deploy the retraining web service
- Use the Batch Execution Service code to retrain the model

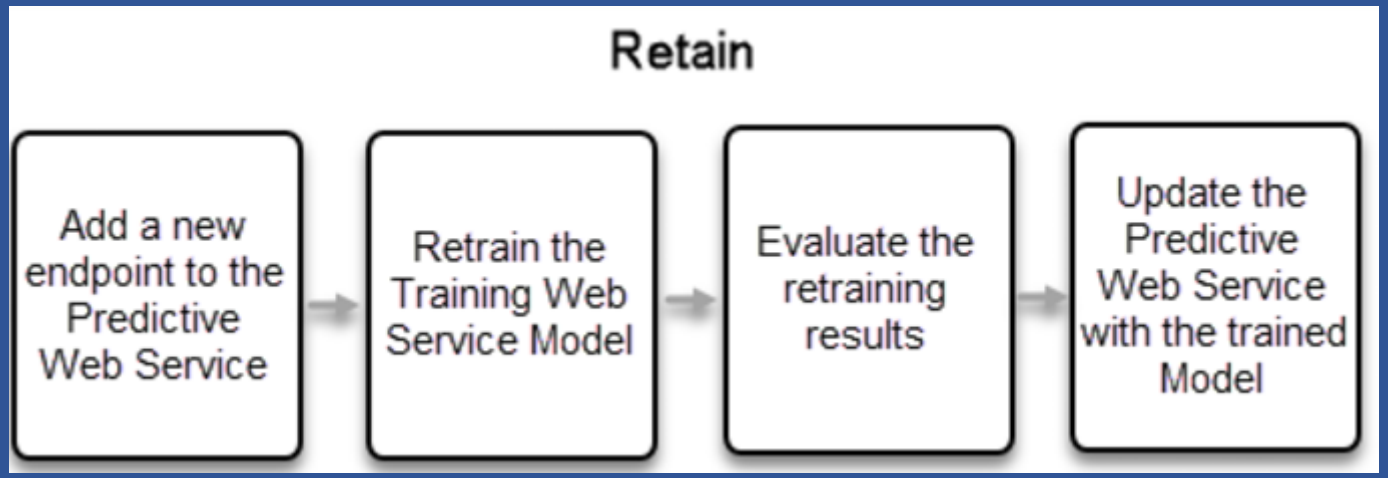
Update endpoint

- Create a new Endpoint on the Predictive Web service
- Get the PATCH URL and code
- Use the PATCH URL to point the new Endpoint at the retrained model

Retrain ML

Retrain workflow diagram





Retrain ML

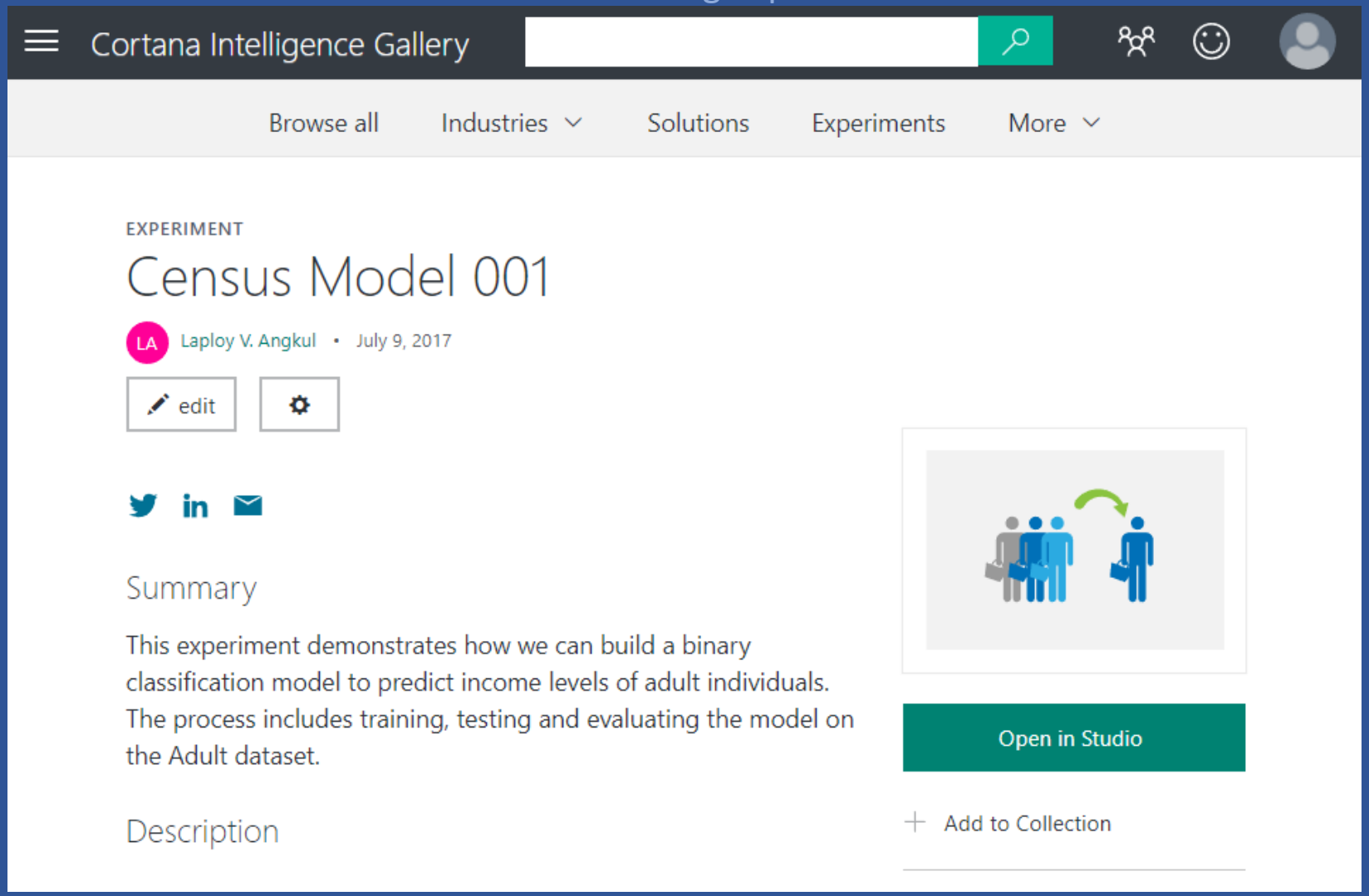
Create new training experiment

Create new ML training experiment by downing an example from Cortana intelligence gallery

1. Go to webpage Cortana intelligence gallery https://gallery.cortanaintelligence.com
2. Enter loy in search box
3. Click Census Model 001
4. Click Open in Studio
5. RUN
6. Click SET UP WEB SERVICE and Predictive web service
7. RUN
8. Change name of Predictive experiment to Census Model 001 Predic
9. RUN
10. Click DEPLOY WEB SERVICE

Retrain ML

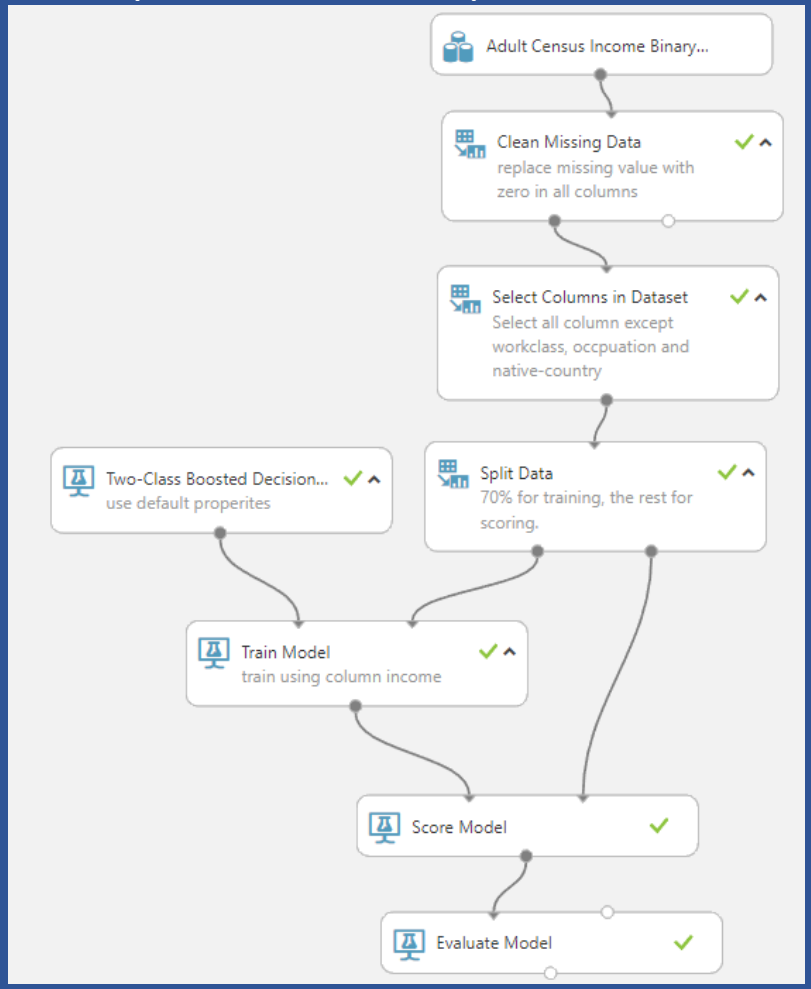
Create a training experiment



Retrain ML

Create new training experiment

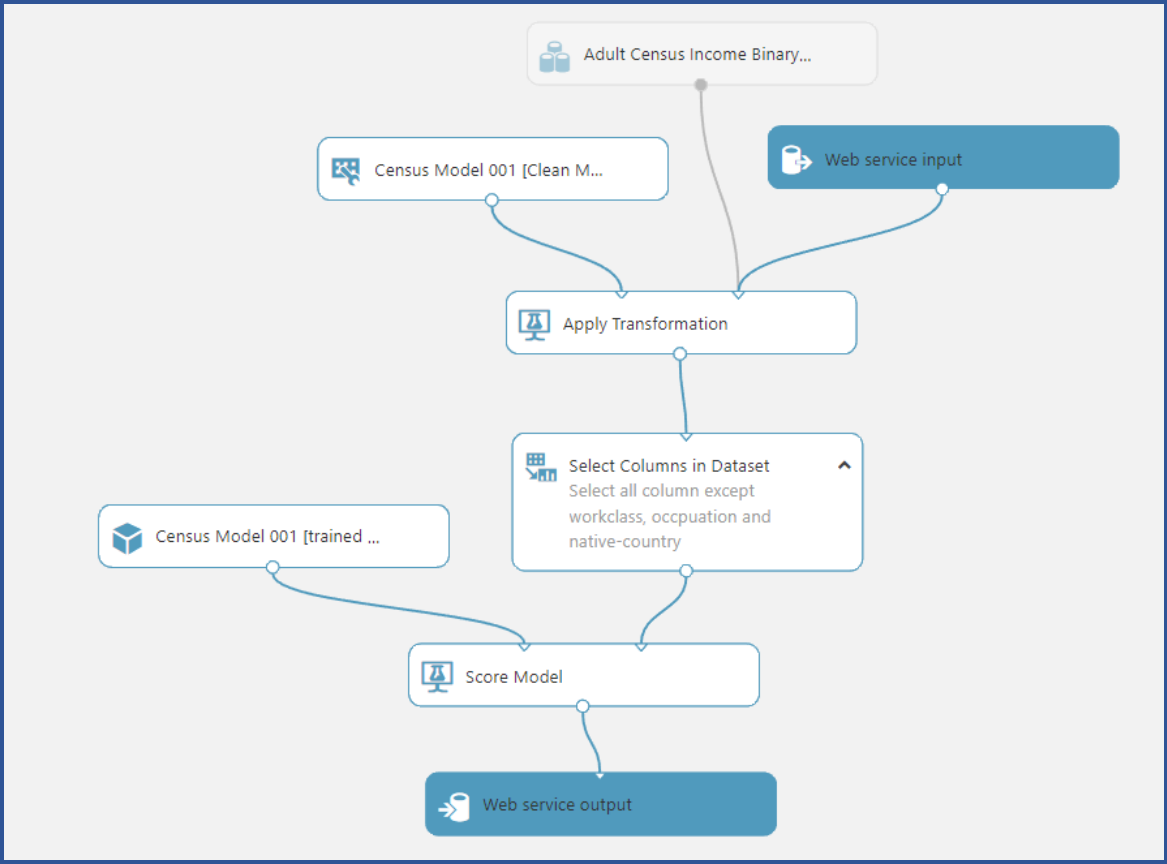
Experiment when open in Studio



Retrain ML

Create/Publish predictive experiment

RUN, SET UP WEB SERVICE / Predictive Web Service [Recommended]



Experiment after SET UP WEB SERVICE and Predictive web service

Retrain ML

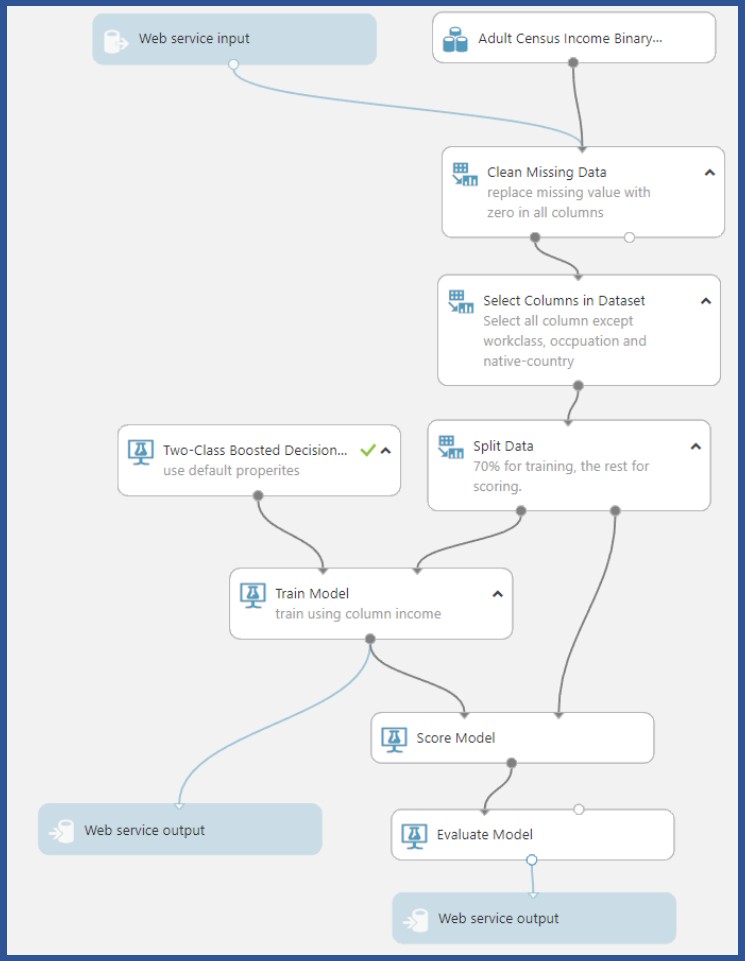
Create/publish a retrain experiment (add IO)

1. Go back to Census Model 001 Experiment
2. Click Training experiment tab
3. Add a web service input module
4. Add two web service output modules
5. Run
6. Click SET UP WEB SERVICE / DEPLOY WEB SERVICE

Retrain ML

Create/publish a retrain experiment (add IO)

Experiment after add web service input / outputs

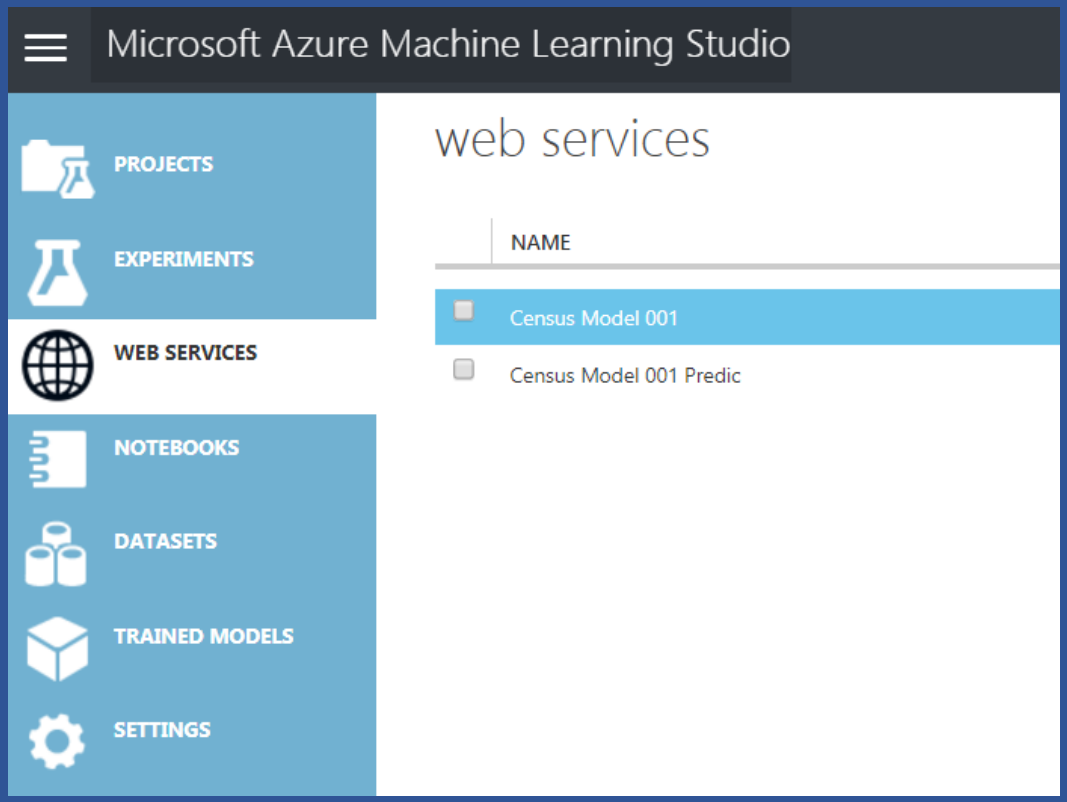


Retrain ML

Create/publish a retrain experiment (add IO)

Click WEB SERVICES

1. Census Model 001 = retrain
2. Census Model 001 Predic = production



Retrain ML

Create C# console Application BES

1. Create a C# Console Application in Visual Studio (New->Project->Windows Desktop->Console Application)
2. Solution/project name = census1
3. Nuget add Microsoft.WindowsAzure.Storage.dll
4. Nuget add Microsoft.AspNet.WebApi.Client
5. Open Microsoft Azure Machine Learning Studio page
6. Click Web Service
7. Click census model 001
8. Click BATCH EXECUTION
9. Copy C# sample code
10. Past code ** Note on name space

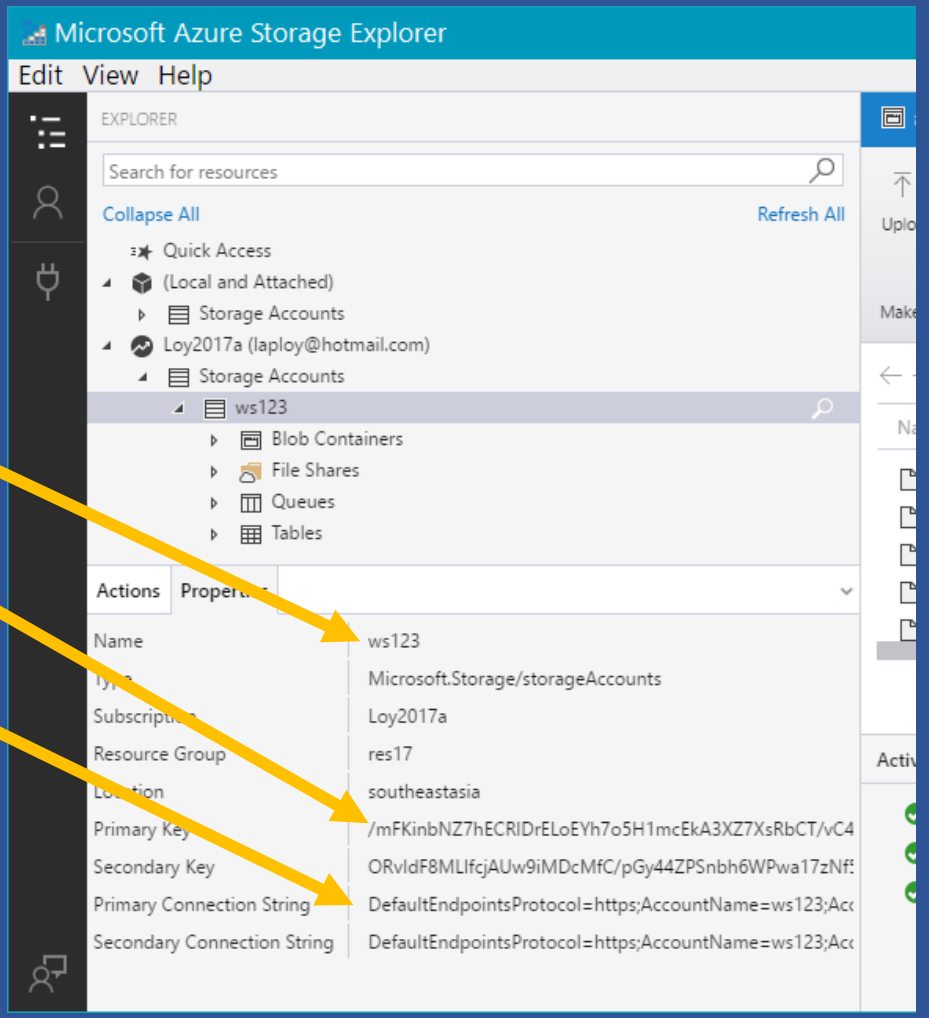
Retrain ML

Get keys from Azure Storage Account

Run program Microsoft Azure Storage Explorer

Copy and save to Notepad

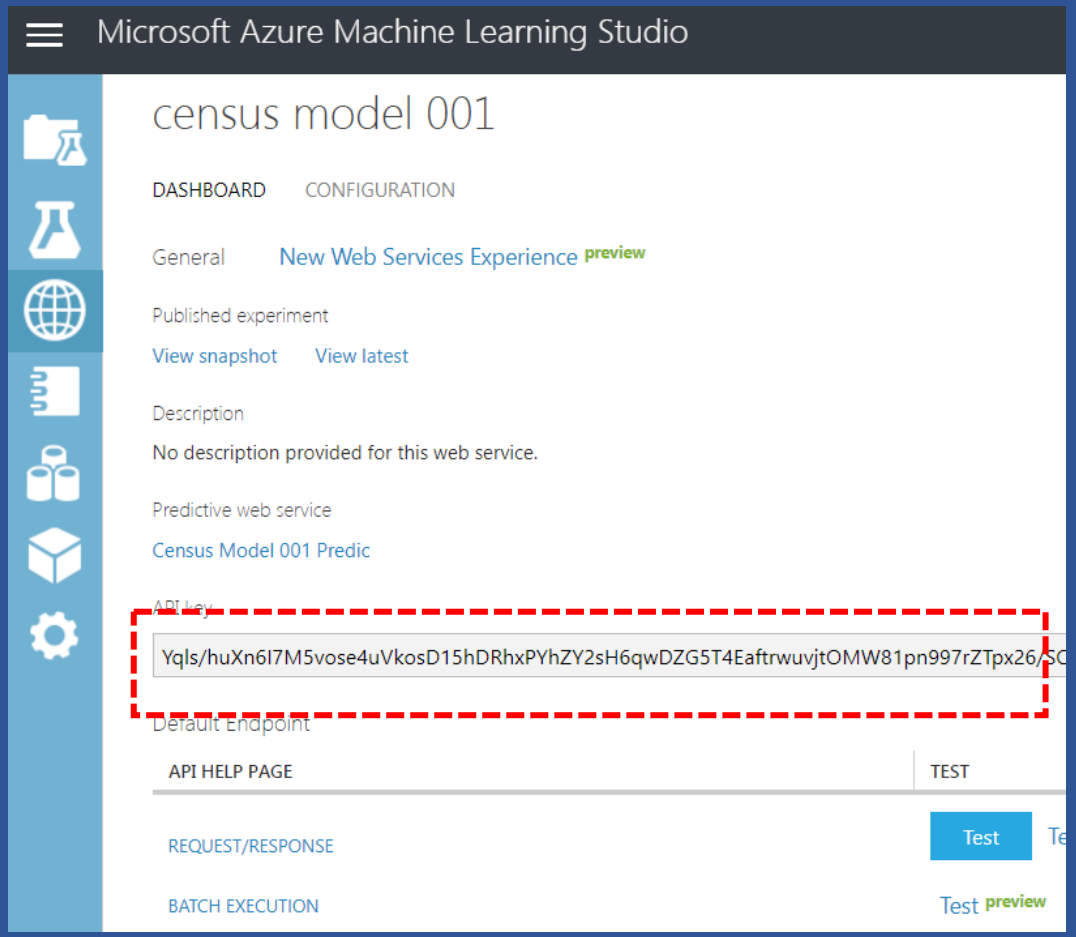
1. Storage Container Name
2. Storage Account Key
3. Storage Connection String



Retrain ML

Update C# code input/output

1. Get Web service API Key from AML BES page (copy and save to Notepad)



Retrain ML

Update C# code input/output

Update C# code for keys

```
// ********************* loy
const string StorageAccountName = "ws123"; // Replace this with yo
const string StorageAccountKey = "/mFKinbNZ7hECRlDrELoEYh7o5H1mcEk
const string StorageContainerName = "test1"; // Replace this with
string storageConnectionString = string.Format("DefaultEndpointsPr
const string apiKey = "mbrj11ijM8MB3IyQ5hO8tZJbnn+101Ru00RWCS6xQ5O
```

Retrain ML

Update C# code input/output

- Update C# code UploadFileToBlob

```
// ********************* loy
UploadFileToBlob(@"d:\temp\cenin1.csv" /*Replace this with the location of your input file*/,
   "cenin1.csv" /*Replace this with the name you would like to use for your Azure blob; this r
   StorageContainerName, storageConnectionString);
```

- Update C# code input file name

```
Inputs = new Dictionary<string, AzureBlobDataReference>()
{

    {
        "input1",
        new AzureBlobDataReference()
        {
            ConnectionString = storageConnectionString,
            // ************************ loy
            RelativeLocation = string.Format("{0}/cenin1.csv", StorageContainerName)
        }
    },
},
```

Retrain ML

Update C# code input/output

Update C# code Output1 / Output2 file name

```
Outputs = new Dictionary<string, AzureBlobDataReference>()
{

    {
        "output2",
        new AzureBlobDataReference()
        {
            ConnectionString = storageConnectionString,
            // ********************* loy
            RelativeLocation = string.Format("/{0}/cenout.ilearner", StorageContainerName)
        }
    },

    {
        "output1",
        new AzureBlobDataReference()
        {
            ConnectionString = storageConnectionString,
            // ********************* loy
            RelativeLocation = string.Format("/{0}/cenout.csv", StorageContainerName)
        }
    },
},
```

Retrain ML

Update C# code input/output

Update C# code Main method to show End program status

```
0 references
static void Main(string[] args)
{
    InvokeBatchExecutionService().Wait();
    // ********************* loy
    Console.WriteLine("End program");
    Console.Read();
}
```

Retrain ML

Retrain and evaluate

Run program

1. Download file cenin1.csv from https://github.com/laploy/ML/blob/master/cenin1.csv
2. Place file cenin1.csv in to d:\temp
3. Run C# Program
4. Wait for End program message

Run this program whenever you have a good training dataset and want to retrain the model

Retrain ML

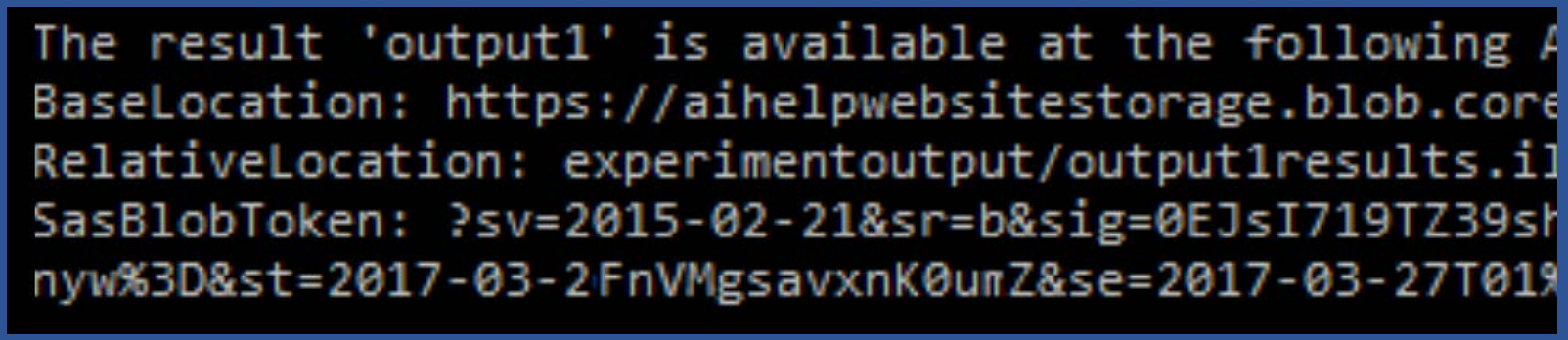
Get iLearner information

Get ilearner information from program output

Copy and paste to Notepad

1. RelativeLocation
2. BaseLocation
3. SasBlobToken

iLearner is the training model we need to update the Prediction model

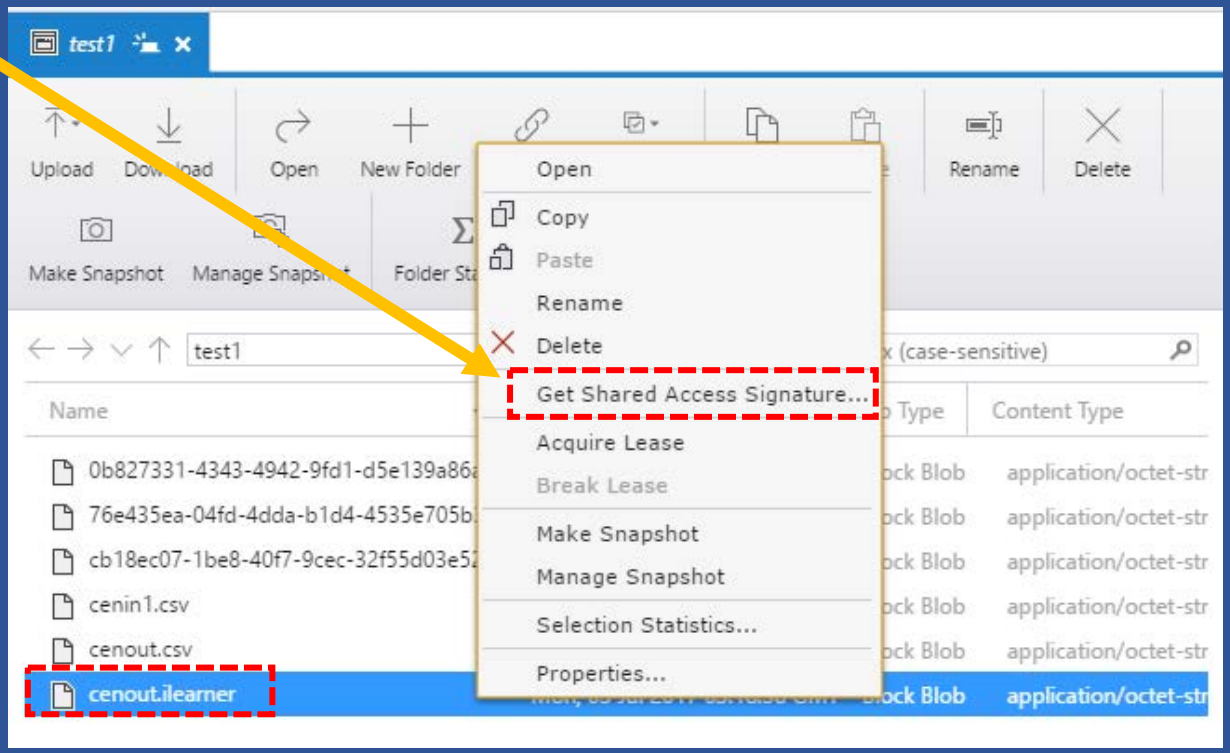


Retrain ML

Get iLearner information

Or using ASE

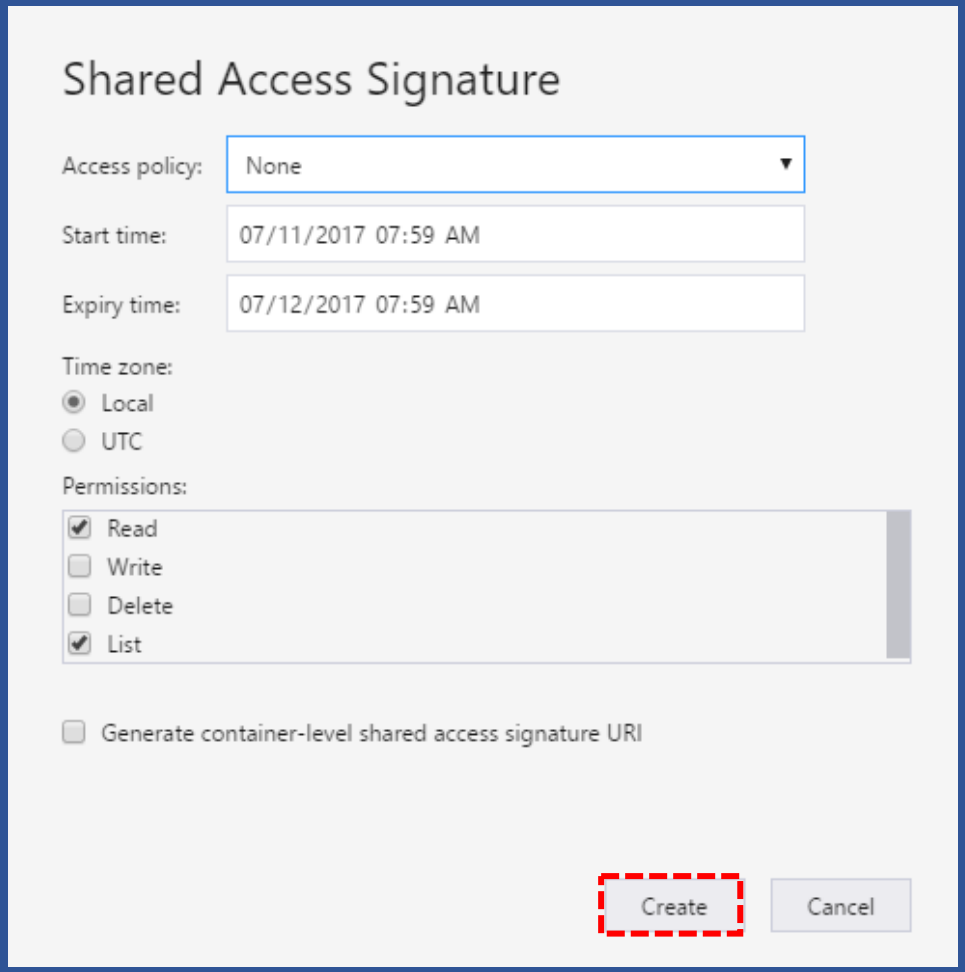
1. Open Microsoft Azure Storage Explorer
2. Right-click at file cenout.ilearner
3. Click Get Shared Access Signature



Retrain ML

Get iLearner information

Click Create

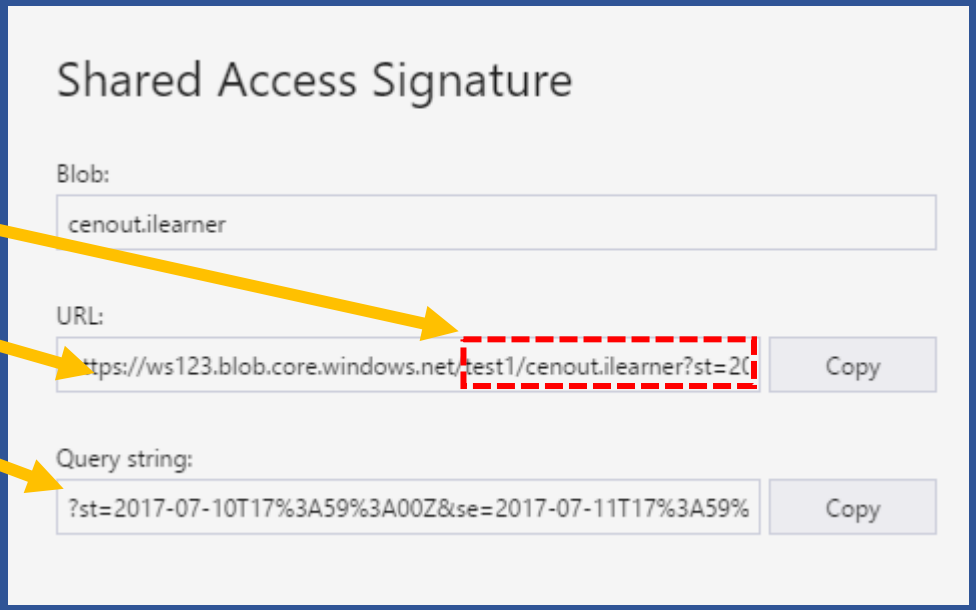


Retrain ML

Get iLearner information

Copy and paste to Notepad

4. RelativeLocation
5. BaseLocation
6. SasBlobToken



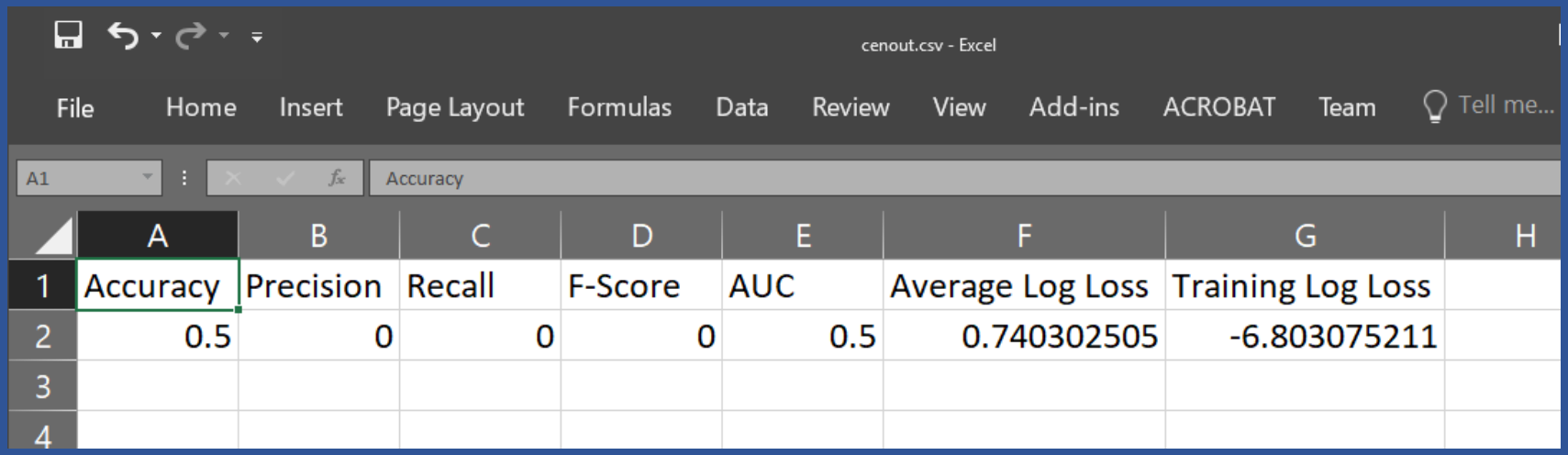
Base location = from start to .net

Retrain ML

Review retrain evaluation

Review retrain evaluation

1. Open Microsoft Azure Storage Explorer
2. Download file cenout.csv
3. Open in Microsoft Excel or Windows Notepad
4. Examine the results

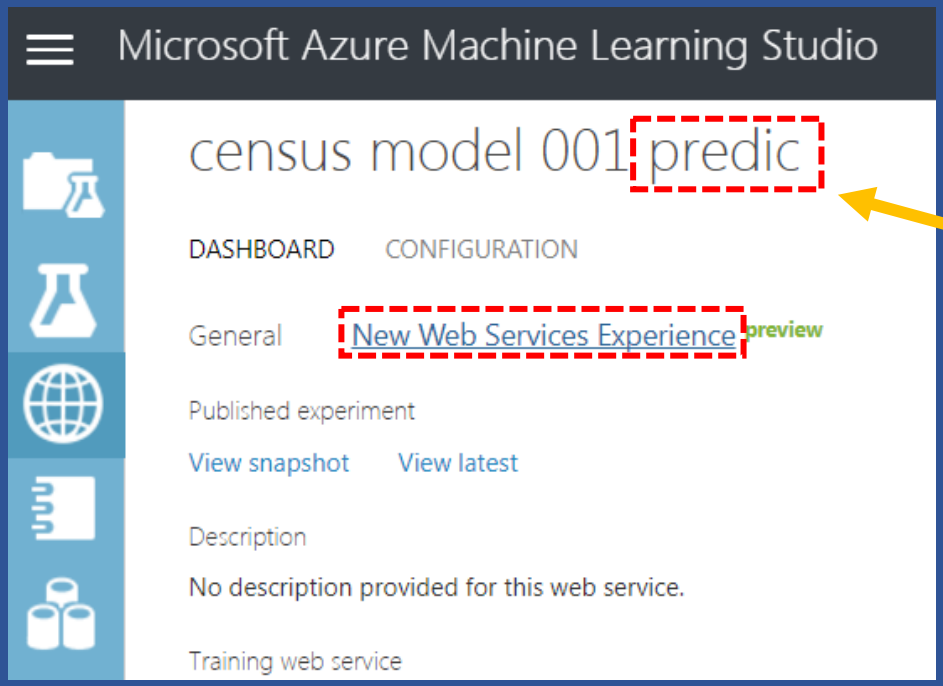


	A	B	C	D	E	F	G	H
1	Accuracy	Precision	Recall	F-Score	AUC	Average Log Loss	Training Log Loss	
2	0.5	0	0	0	0.5	0.740302505	-6.803075211	
3								
4								

Retrain ML

Add a new Endpoint

Click New Web Services Experience

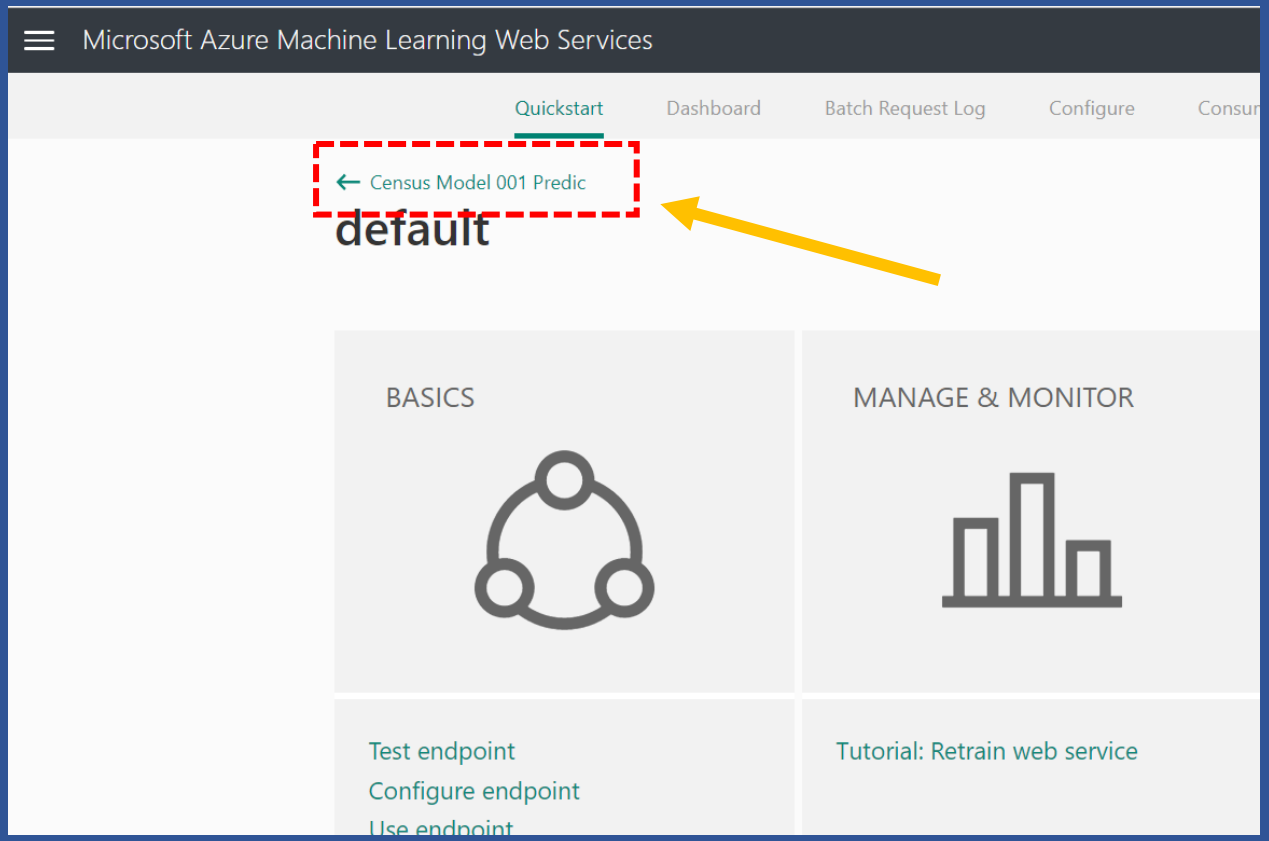


Prediction WS not Retrain WS

Retrain ML

Add a new Endpoint

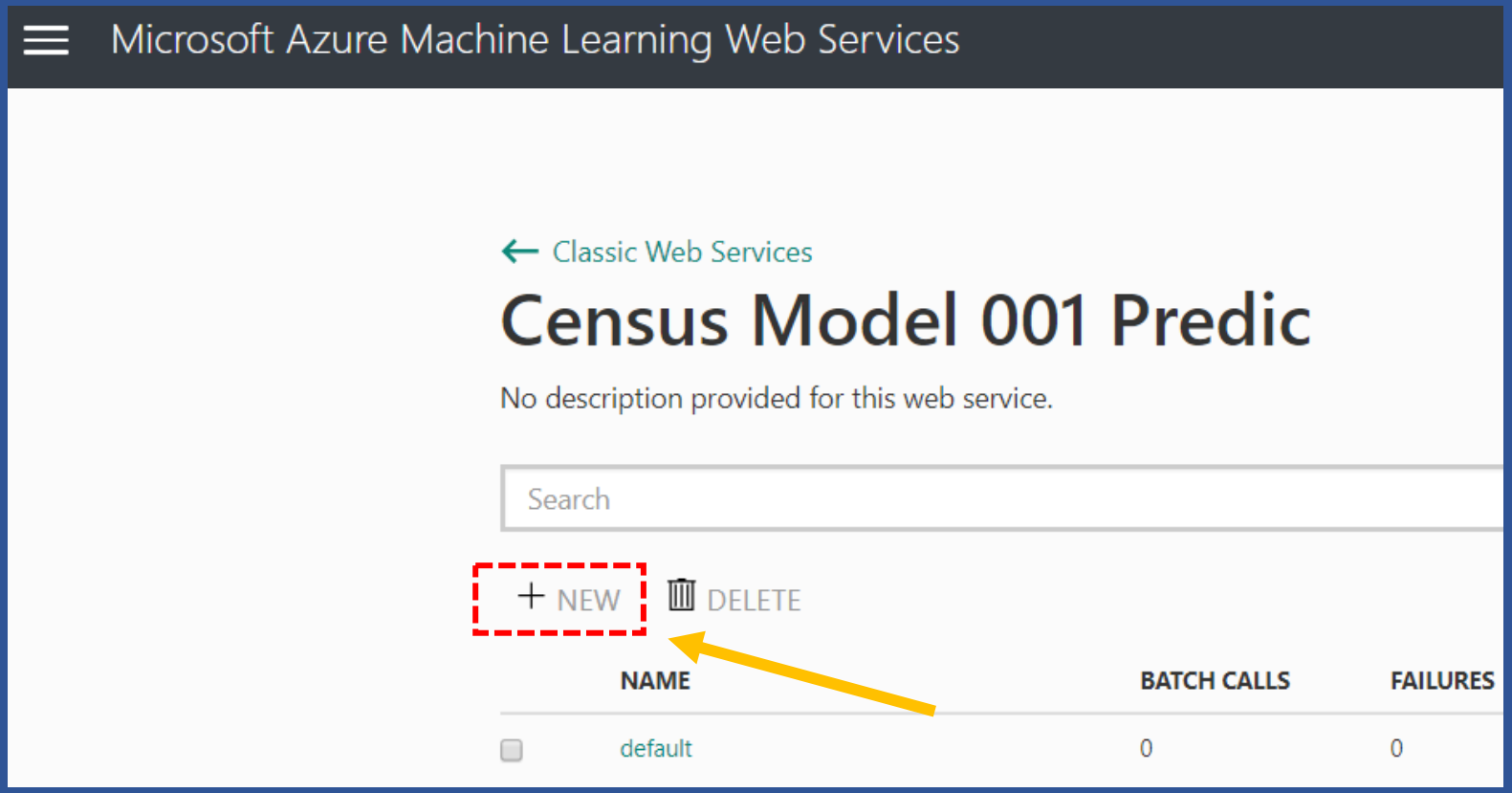
Click Census Model 001 Predic



Retrain ML

Add a new Endpoint

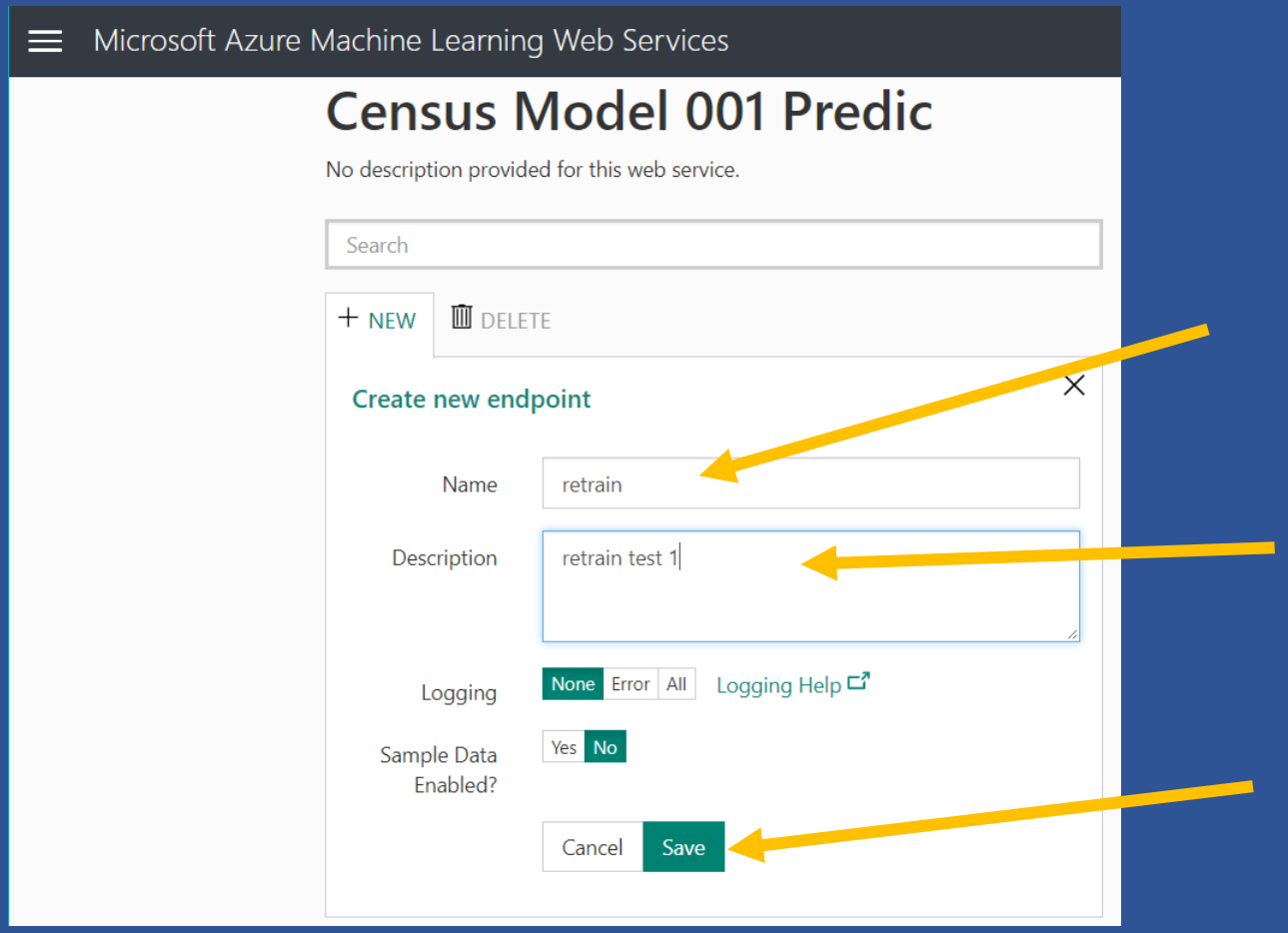
Click + NEW



Retrain ML

Add a new Endpoint

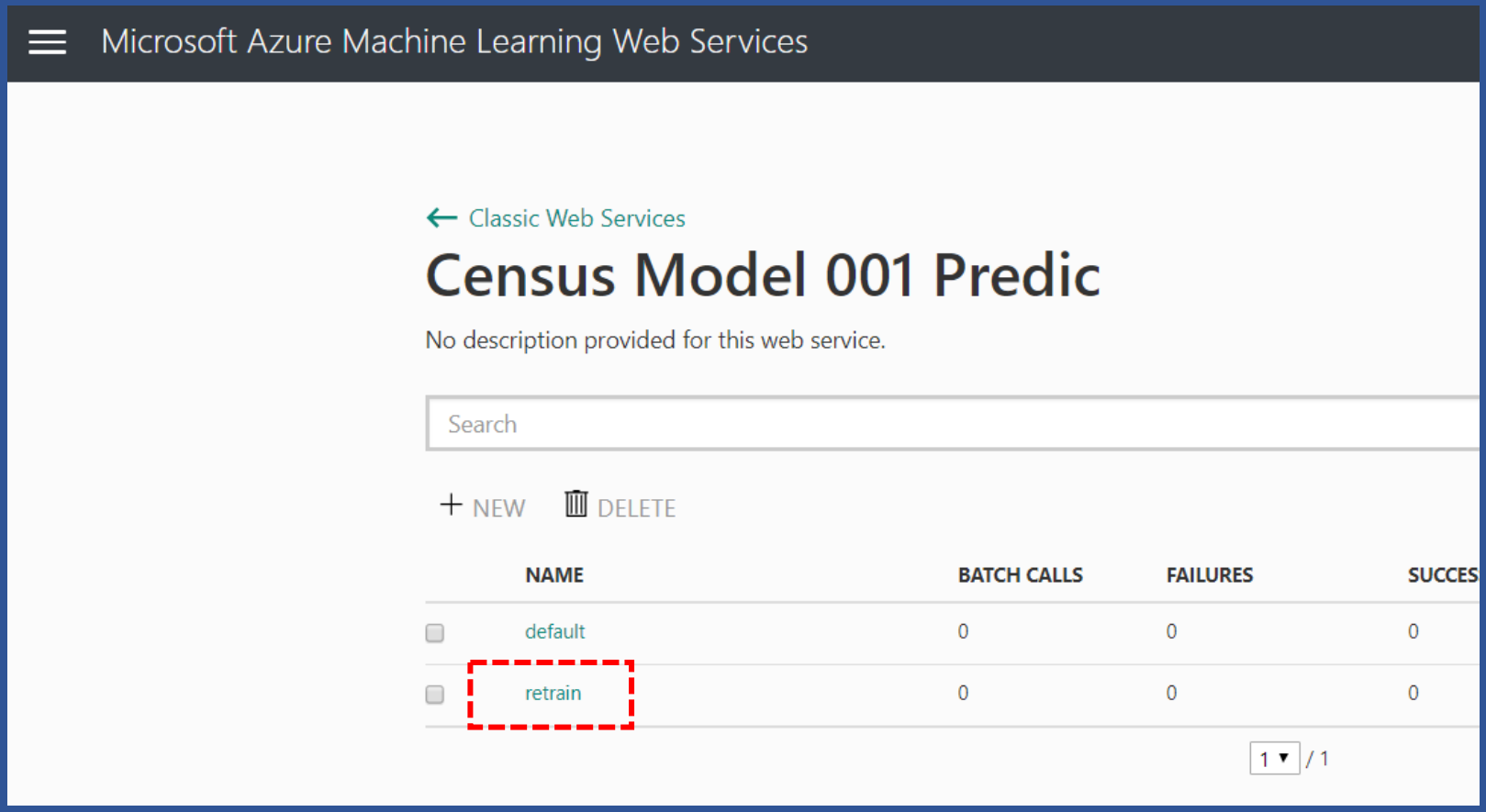
Enter name, description and click Save



Retrain ML

Update endpoint

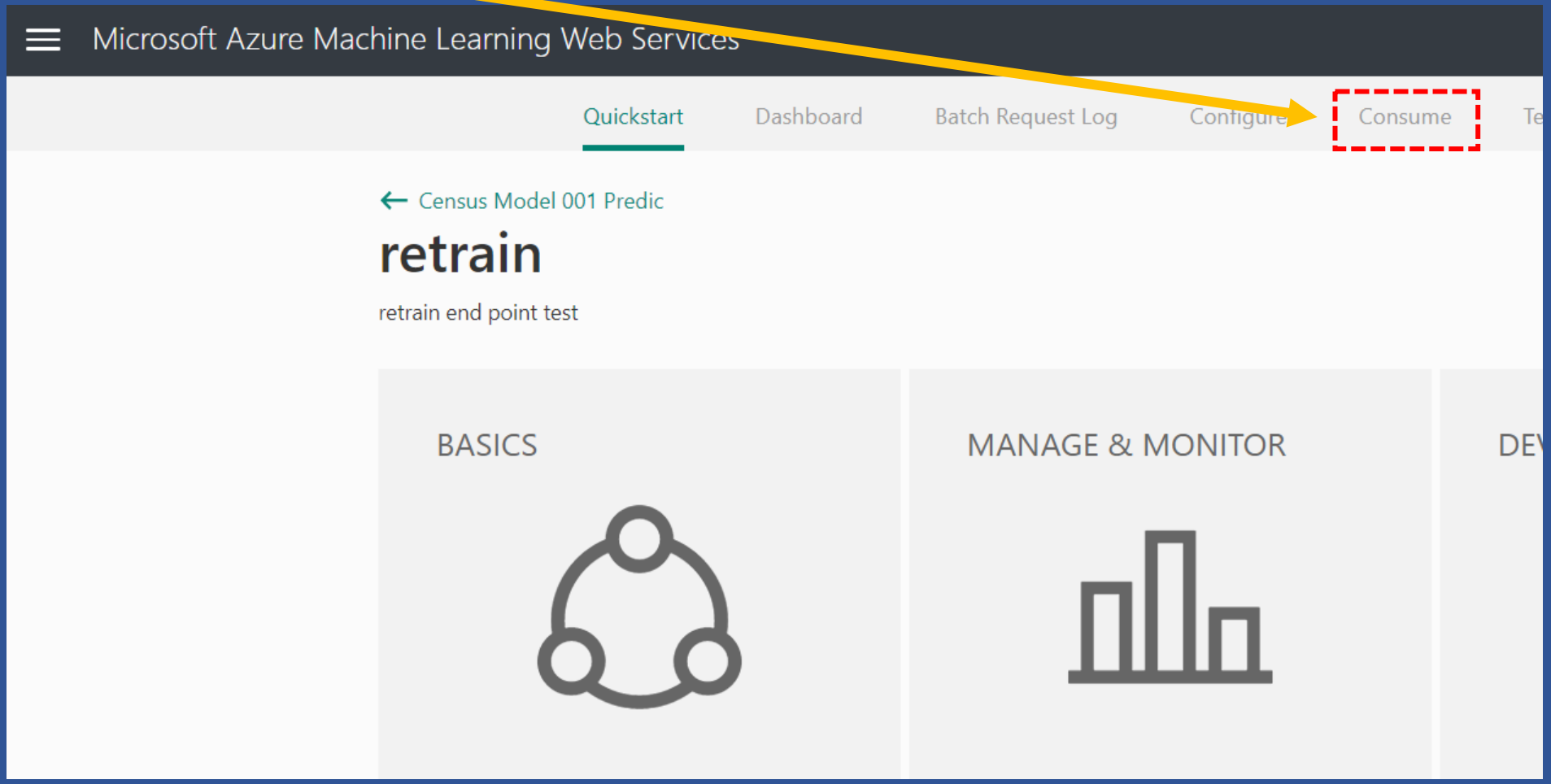
Click retrain end point



Retrain ML

Update endpoint

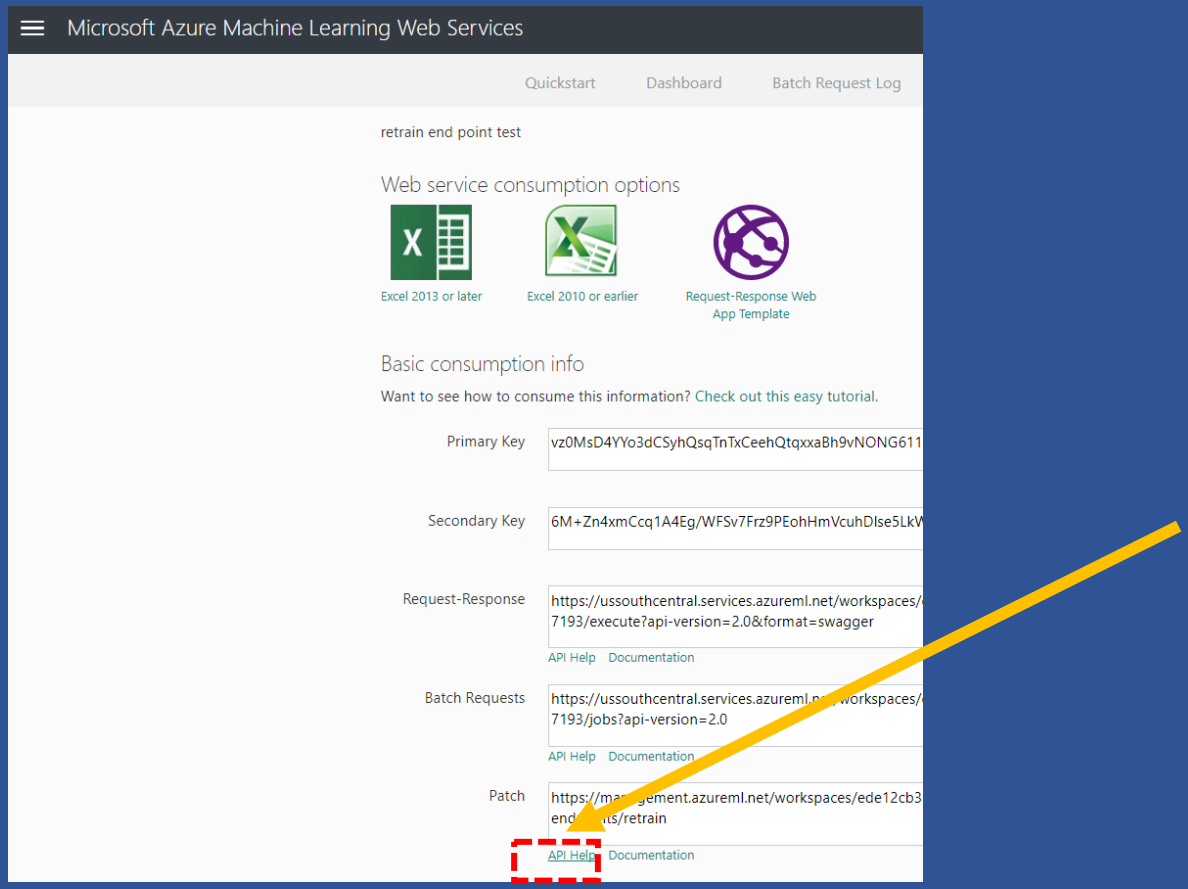
Click Consume



Retrain ML

Update endpoint

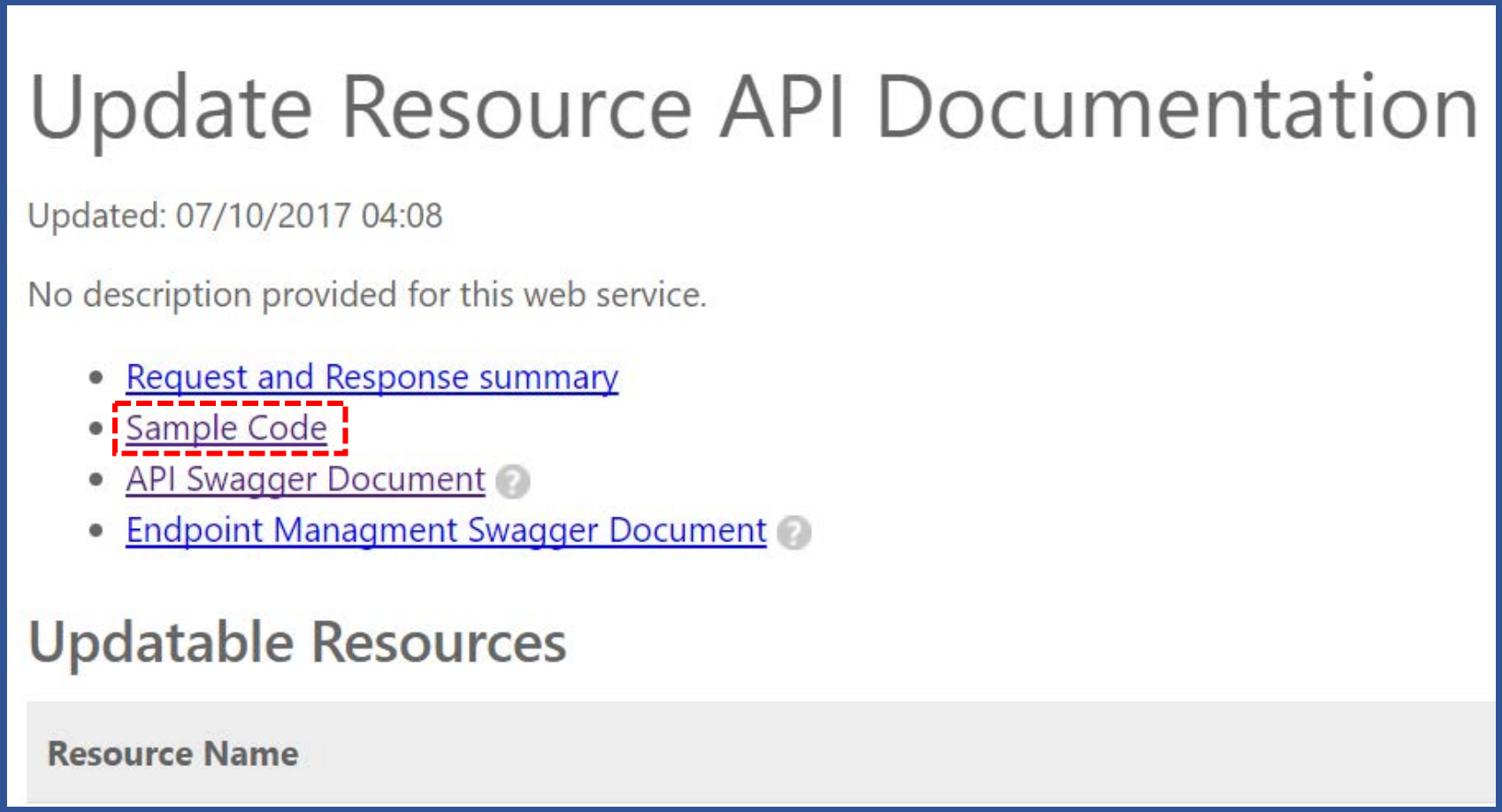
Click API Help



Retrain ML

Update endpoint

Click Sample Code



Copy C# code

Retrain ML

Update endpoint

Create a program to update the endpoint

- Open Visual Studio
- Create new C# Windows console app project
- Name = CallUpdateResource
- Paste code to main
- Update
    1. const string apiKey: get key from web service page
    2. BaseLocation
    3. RelativeLocation
    4. SasBlobToken
    5. Add a message to show success end
- Run program

Run this program only once

Retrain ML

More information

Retrain a Machine Learning Model

https://docs.microsoft.com/en-us/azure/machine-learning/machine-learning-retrain-machine-learning-model

Census Model 001

https://gallery.cortanaintelligence.com/Experiment/Census-Model-001