**SAP Leonardo Machine Learning Foundation**

Version 1.0

**Part 4- Bring Your Own Model (BYOM)**

**Objective**:

In this Hands On exercise we shall see how to import an external model and execute it.

Currently SAP Leonardo supports only tensorflow models, so we shall import the “mnist” model, to recognize hand written digits.

**BYOM** means this model is not provided by SAP Leonardo and the API is not available in the service key. By the end of this exercise we will know what services we need to import an external model and create an inference on that.

**Pre-requisite:**

* Intended audience are expected to complete part 1, part 2 and part 3 of this document.
* The audience should be comfortable using the CF CLI.
* The MNIST model as well as all the python code for this exercise are provided as training material.

Note: In the Trial Account we can have only one deployed model at a time. If you have done the retraining of image classifier in part 3, you will have to remove the model. The steps to remove the model are shown at the end of part 3.

# Bring Your Own Model (BYOM)

* 1. Get the External Machine Learning Model

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| We will use the “mnist” model provided as training content. |  |  |
| Login to the cloud foundry as shown previously. |  |  |
| See the currently available model:  **cf sapml model list** |  |  |

* 1. Upload/Import the “mnist” model in SAP ML Foundation

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| Navigate to the MLF-Master folder (Or to which path the model is available).  Enter the following command to create a model named “**mnist\_byom**” with the file “**mnist.zip**”:  **cf sapml model create mnist\_byom -f mnist.zip**  Check the available models again:  **cf sapml model list** |  |  |
| Check the available resource plans for our models:  **cf sapml modelserver resourceplans** |  |  |
| Deploy the model, assigning the “starter” resource:  **cf sapml modelserver create mnist\_byom -r starter**  See the available modelserver using:  **cf sapml modelserver list**  See the Detailed info of the modelserver:  **cf sapml modelserver get ms-ca117421-bb92-43c0-8d83-df0a9ca7f748**  (Note. Last part is the ID) |  |  |

* 1. Create an Application to do the Inference (Python).

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| In the training content we also have a file called “byom” we can find the application already built in it. |  |  |
| We need to setup some configurations in the “manifest.yml” file according to our SAP ML service.  Under “applications” give the “host” as your <organisation>-<space>. This way it will be unique.  Also in “services” enter your ML Service name.  (You can check using  “**cf s**” command)  Also check the “MLF\_SERVICE” ; it depends on the account, i.e. trial or production.  Also in app.py change the [{@app.route(‘/mnist’,methods=’POST’)](mailto:%7b@app.route('/mnist',methods='POST')) to ‘/mnist\_byom’  i.e. change the model name. |  |  |
| Navigate to the “MLF-master” or on which folder your application is (In our case it is MLF-master/byom) |  |  |
| Deploy the application using the command:  **cf push** |  |  |
| Get the URL from the app |  |  |
| To check the deployed apps execute:  **cf a** |  |  |
| To check the details of the particular “byom” app:  **cf app byom**  Make a note of the URL. We will need it in the next step. |  |  |

* 1. Run the byom application on postman

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| Open Postman. We don’t need to do any configurations as it is already done programmatically in app.py of our application.  Paste the URL (from the previous step) in the address bar and add ‘/mnist\_byom’ at the end of the URL. |  |  |
| Upload the hand-written digits image in body.  Click on “**body**” tab.  Enter the following value in **form-data** type:  Key : file  select the input type:  <file>  Select any handwritten digit’s image (Already available in the “images” folder of training content) |  |  |