MAADSBML Setup and Configuration

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April 13, 2024

Setup

1. You will need to have Linux OS installed
    - In Windows – you can install WSL (windows subsystem for Linux)
    - In Mac – Use Terminal
    - Or get a VM running with Linux Ubuntu installed
    - Further Information can be found in Appendix N in this PDF
2. Install Docker:
    - You can install Docker Desktop (Windows/Mac)
    - Or in linux run: sudo apt install docker.io
3. Pull the maadsbml docker container:
    - AMD64 container for Windows/Linux is here: docker pull maadsdocker/maads-batch-automl-otics
    - ARM64 container for MAC is here: docker pull maadsdocker/maads-batch-automl-otics-arm64

Setup Local Folders

4. Create Local File Folders in your computer – these MUST be the following:

a) {YOUR LOCAL FOLDER PATH}/csvuploads
b) {YOUR LOCAL FOLDER PATH}/pdfreports
c) {YOUR LOCAL FOLDER PATH}/autofeatures
d) {YOUR LOCAL FOLDER PATH}/outliers
e) {YOUR LOCAL FOLDER PATH}/sqlloads
f) {YOUR LOCAL FOLDER PATH}/networktemp
g) {YOUR LOCAL FOLDER PATH}/networks
h) {YOUR LOCAL FOLDER PATH}/exception
i) {YOUR LOCAL FOLDER PATH}/staging

Where {YOUR LOCAL FOLDER PATH} is the ROOT folder on your local computer

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5. Run the Docker Container with the following command:

```
docker run -d -v {YOUR LOCAL FOLDER
PATH}/csvuploads:/maads/agentfilesdocker/dist/maadsweb/csvuploads:z
-v {YOUR LOCAL FOLDER PATH}/pdfreports:/maads/agentfilesdocker/dist/maadsweb/pdfreports:z
-v {YOUR LOCAL FOLDER PATH}/autofeatures:/maads/agentfilesdocker/dist/maadsweb/autofeatures:z
-v {YOUR LOCAL FOLDER PATH}/outliers:/maads/agentfilesdocker/dist/maadsweb/outliers:z
-v {YOUR LOCAL FOLDER PATH}/sqlloads:/maads/agentfilesdocker/dist/maadsweb/sqlloads:z
-v {YOUR LOCAL FOLDER PATH}/networktemp:/maads/agentfilesdocker/dist/maadsweb/networktemp:z
-v {YOUR LOCAL FOLDER PATH}/networks:/maads/agentfilesdocker/networks:z
-v {YOUR LOCAL FOLDER PATH}/exception:/maads/agentfilesdocker/dist/maadsweb/exception:z
-v {YOUR LOCAL FOLDER PATH}/staging:/maads/agentfilesdocker/dist/staging:z
-p 5595:5595 -p 5495:5495 -p 10000:10000 --env TRAININGPORT=5595 --env PREDICTIONPORT=5495 --env
ABORTPORT=10000 --env COMPANYNAME=OTICS --env MAXRUNTIME=20 --env MAINHOST=127.0.0.1
maadsdocker/maads-batch-automl-otics
```

Note: Replace {YOUR LOCAL FOLDER PATH} with the step in 4.

Setup

5b. If everything went well you will see the running container:

```
seb@DESKTOP-H0DIAMM:~$ docker run -d  -v /mnt/c/maads/maadsbml/csvuploads:/maads/agentfilesdocker/dist/maadsweb/
csvuploads:z           -v /mnt/c/maads/maadsbml/pdfreports:/maads/agentfilesdocker/dist/maadsweb/pdfreports:z
         -v /mnt/c/maads/maadsbml/autofeatures:/maads/agentfilesdocker/dist/maadsweb/autofeatures:z
-v /mnt/c/maads/maadsbml/outliers:/maads/agentfilesdocker/dist/maadsweb/outliers:z           -v /mnt/c/maads/ma
adsbml/sqlloads:/maads/agentfilesdocker/dist/maadsweb/sqlloads:z           -v /mnt/c/maads/maadsbml/networktemp
:/maads/agentfilesdocker/dist/maadsweb/networktemp:z           -v /mnt/c/maads/maadsbml/networks:/maads/agentfi
lesdocker/networks:z           -v /mnt/c/maads/maadsbml/exception:/maads/agentfilesdocker/dist/maadsweb/excepti
on:z           -v /mnt/c/maads/maadsbml/staging:/maads/agentfilesdocker/dist/staging:z -p 5595:5595 -p 5495:549
5 -p 10000:10000 --env TRAININGPORT=5595 --env PREDICTIONPORT=5495 --env ABORTPORT=10000 --env COMPANYNAME=OTICS
 --env MAXRUNTIME=20 --env MAINHOST=127.0.0.1 maadsdocker/maads-batch-automl-otics
a6d119d761f1c1e9488bd0baefff5153b096e31128e20647d844f4c98ffd3991
seb@DESKTOP-H0DIAMM:~$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED         STATUS         PO
RTS
                  NAMES
a6d119d761f1   maadsdocker/maads-batch-automl-otics   "/bin/bash -c 'while…"   7 seconds ago   Up 5 seconds   0.
0.0.0:5495->5495/tcp, :::5495->5495/tcp, 0.0.0.0:5595->5595/tcp, :::5595->5595/tcp, 0.0.0.0:10000->10000/tcp, ::
:10000->10000/tcp   lucid_galois
seb@DESKTOP-H0DIAMM:~$
```

RUN: docker ps to see the running container

Note: if you get a docker.sock error – just do:

- Run: sudo chmod 666 /var/run/docker.sock
- Then Re-run the docker Run command

Setup

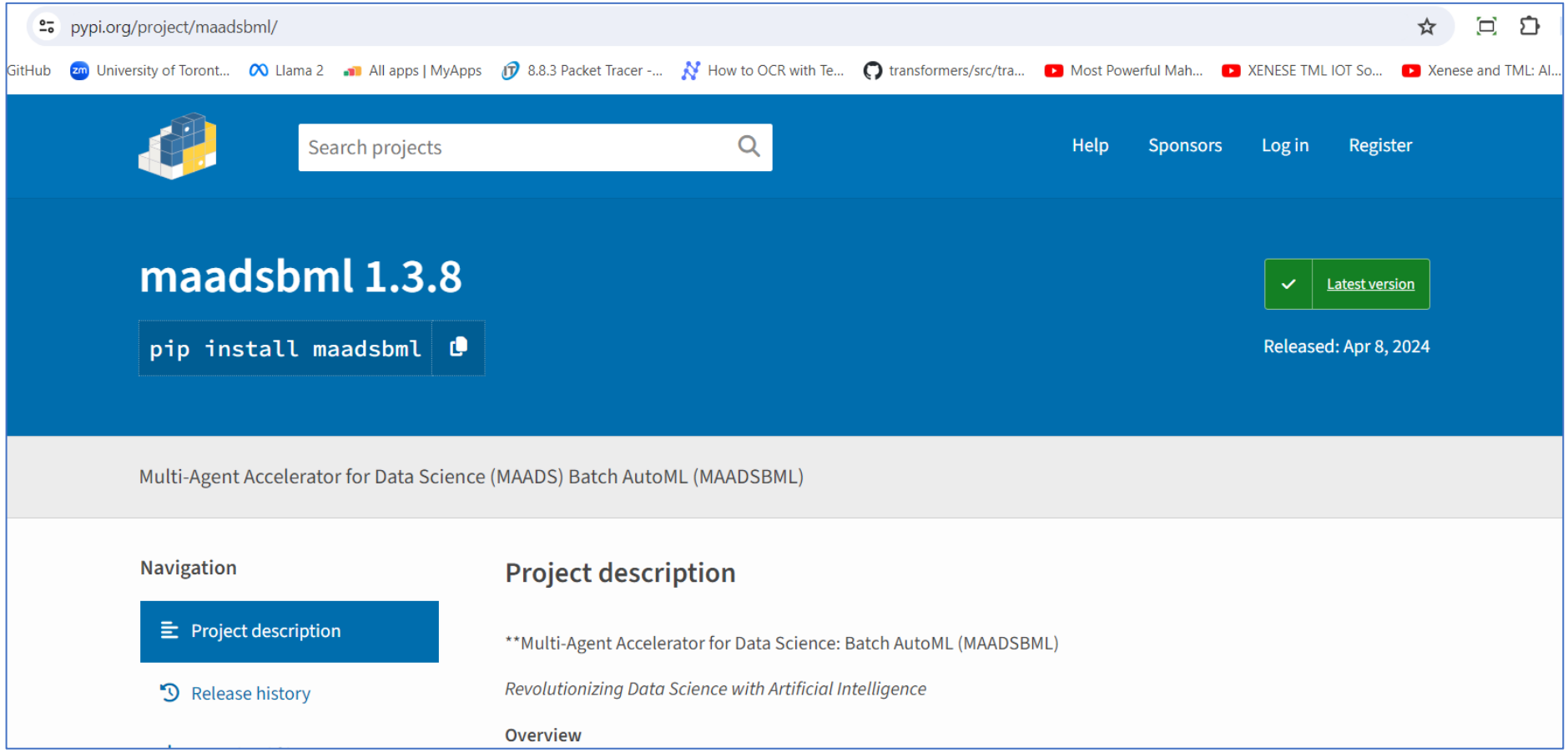
5c. Go inside the container:

```
seb@DESKTOP-H0DIAMM:~$ docker ps
CONTAINER ID   IMAGE                                  COMMAND                  CREATED         STATUS         PO
RTS
                 NAMES
a6d119d761f1   maadsdocker/maads-batch-automl-otics   "/bin/bash -c 'while…"   7 seconds ago   Up 5 seconds   0.
0.0.0:5495->5495/tcp, :::5495->5495/tcp, 0.0.0.0:5595->5595/tcp, :::5595->5595/tcp, 0.0.0.0:10000->10000/tcp, ::
:10000->10000/tcp   lucid_galois
seb@DESKTOP-H0DIAMM:~$ docker exec -it a6d119d761f1 bash
root@a6d119d761f1:/# tmux ls
maads-bml: 1 windows (created Fri Apr 12 18:02:09 2024)
maadsbml-prediction-server: 1 windows (created Fri Apr 12 18:02:23 2024)
maadsbml-training-server: 1 windows (created Fri Apr 12 18:02:13 2024)
root@a6d119d761f1:/#
```

RUN: docker exec --it <container ID> bash
For the above container it would be:
RUN: docker exec -it a6d119d761f1 bash
RUN: tmux ls (you will see the TMUX widows)
To go inside a TMUX window type:
RUN: tmux a --t maadsbml-training-server (to exit TMUX enter: Ctlr+b, d)
maadsbml-training-server is where the MAADSBML solution runs.

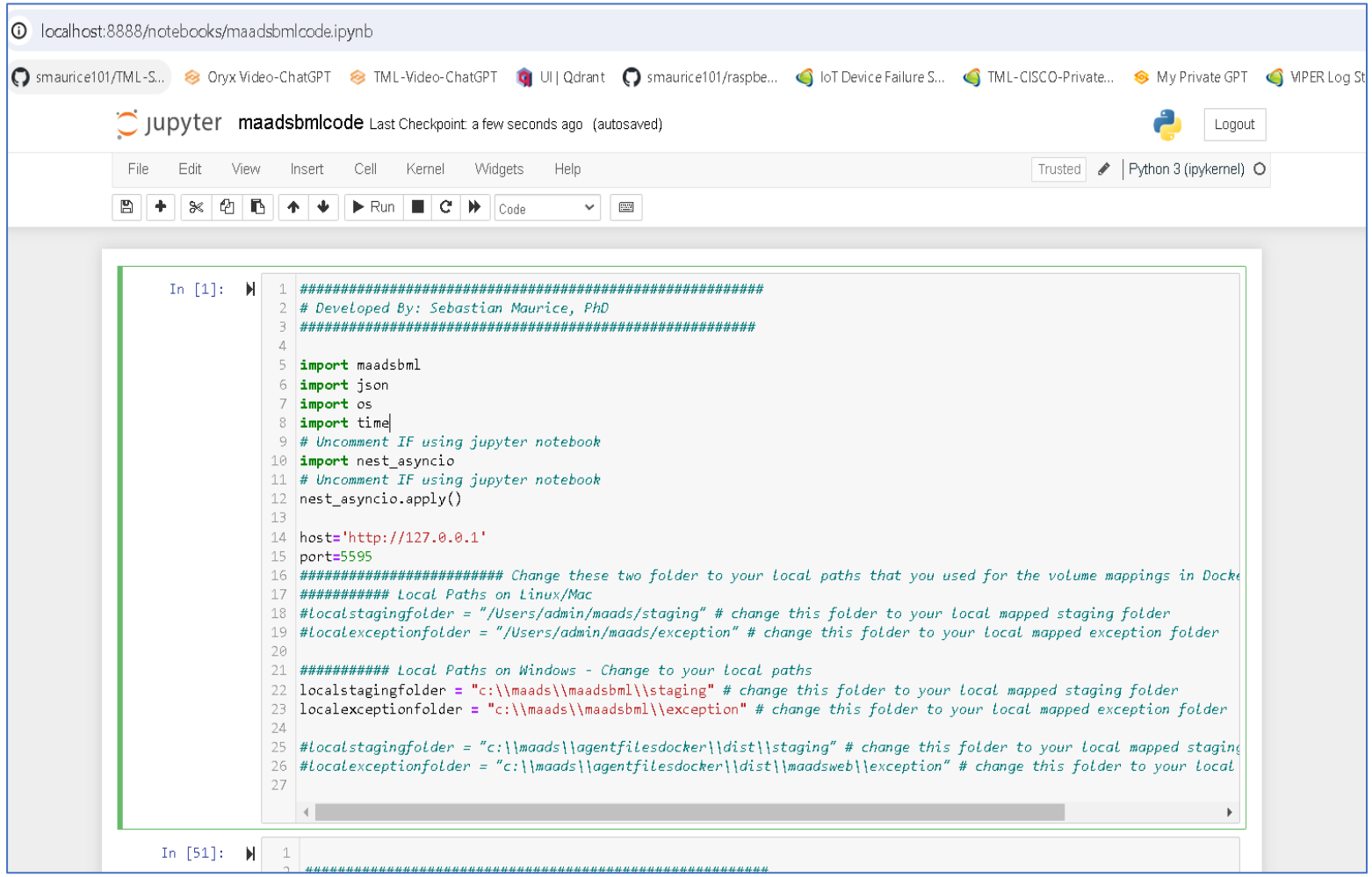
Python File

6. Pip install [maadsbml Python Library](): pip install maadsbml



Python File Configurations

7. Now open the MAADSBML Jupyter Python Notebook called maadsbmlcode.ipynb




```
##########################################################
# Developed By: Sebastian Maurice, PhD
##########################################################

import maadsbml
import json
import os
import time
# Uncomment IF using jupyter notebook
import nest_asyncio
# Uncomment IF using jupyter notebook
nest_asyncio.apply()

host='http://127.0.0.1'
port=5595
######################### Change these two folder to your local paths that you used for the volume mappings in Docke
########### Local Paths on Linux/Mac
#localstagingfolder = "/Users/admin/maads/staging" # change this folder to your local mapped staging folder
#localexceptionfolder = "/Users/admin/maads/exception" # change this folder to your local mapped exception folder

########### Local Paths on Windows - Change to your local paths
localstagingfolder = "c:\\maads\\maadsbml\\staging" # change this folder to your local mapped staging folder
localexceptionfolder = "c:\\maads\\maadsbml\\exception" # change this folder to your local mapped exception folder

#localstagingfolder = "c:\\maads\\agentfilesdocker\\dist\\staging" # change this folder to your local mapped staging
#localexceptionfolder = "c:\\maads\\agentfilesdocker\\dist\\maadsweb\\exception" # change this folder to your local
```

Make the following simple changes to

- localstagingfolder (line 22)
- Localexceptionfolder (line 23)
- These MUST point to the STAGING and EXCEPTION folder paths in STEP 4.h and 4.i
- To test the system - run the RUNDEMO function. Details on the rundemo function is found here

MAADSBML Local Output From Container

8. The MAADSBML container will store the output in the container and also on your host machine

a) {YOUR LOCAL FOLDER PATH}/csvuploads – THIS IS WHERE YOU WRITE YOUR OWN FILE FOR PROCESSING
b) {YOUR LOCAL FOLDER PATH}/pdfreports – THIS IS WHERE YOU WILL FIND THE MAADSBML PDF REPORT
c) {YOUR LOCAL FOLDER PATH}/autofeatures – THIS IS WHERE YOU WILL FIND THE AUTOFEATURES
d) {YOUR LOCAL FOLDER PATH}/outliers – THIS IS WHERE YOU WILL FIND OUTLIERS
e) {YOUR LOCAL FOLDER PATH}/sqlloads – *THIS IS A SYSTEM FOLDER*
f) {YOUR LOCAL FOLDER PATH}/networktemp – *THIS IS A SYSTEM FOLDER*
g) {YOUR LOCAL FOLDER PATH}/networks – THIS IS WHERE THE ALGORITHMS ARE STORED
h) {YOUR LOCAL FOLDER PATH}/exception – THIS IS THE JSON FILE FOR THE ALGORITHM OUTPUT
i) {YOUR LOCAL FOLDER PATH}/staging – *THIS IS A SYSTEM FOLDER*

Using Your Own Data

8. To process your own data –

- YOU MUST STORE YOUR DATA in the **{YOUR LOCAL FOLDER PATH}/csvuploads**
- **The data Must be CSV**
- **The first column of the data file Must contain a Date column**
- **The Date Must be in the format: M/D/YYYY**
- **Example of data files can be found here:**
  - **Look at: aesopowerdemand.csv**

1	Date	AESO_Power_Demand	Calgary_Weather	Edmonton_Weather	FtMac_Weather
2	1/1/2014	9641	-5.15	-17.92	-32.4
3	1/2/2014	9648	-0.7	-6.69	-15.45
4	1/3/2014	9979	-4.1	-5.56	-19.3
5	1/4/2014	10044	-16.5	-18.86	-30.1
6	1/5/2014	9956	-19.95	-26.64	-32
7	1/6/2014	10037	-5.55	-15.36	-24.65
8	1/7/2014	9933	-6.4	-13.25	-28.35

- Your CSV must contain column headings
- The Dependent variable MUST be contained in this file
- ALL DATA IN YOUR CSV MUST BE NUMERIC (with exception of column headers)

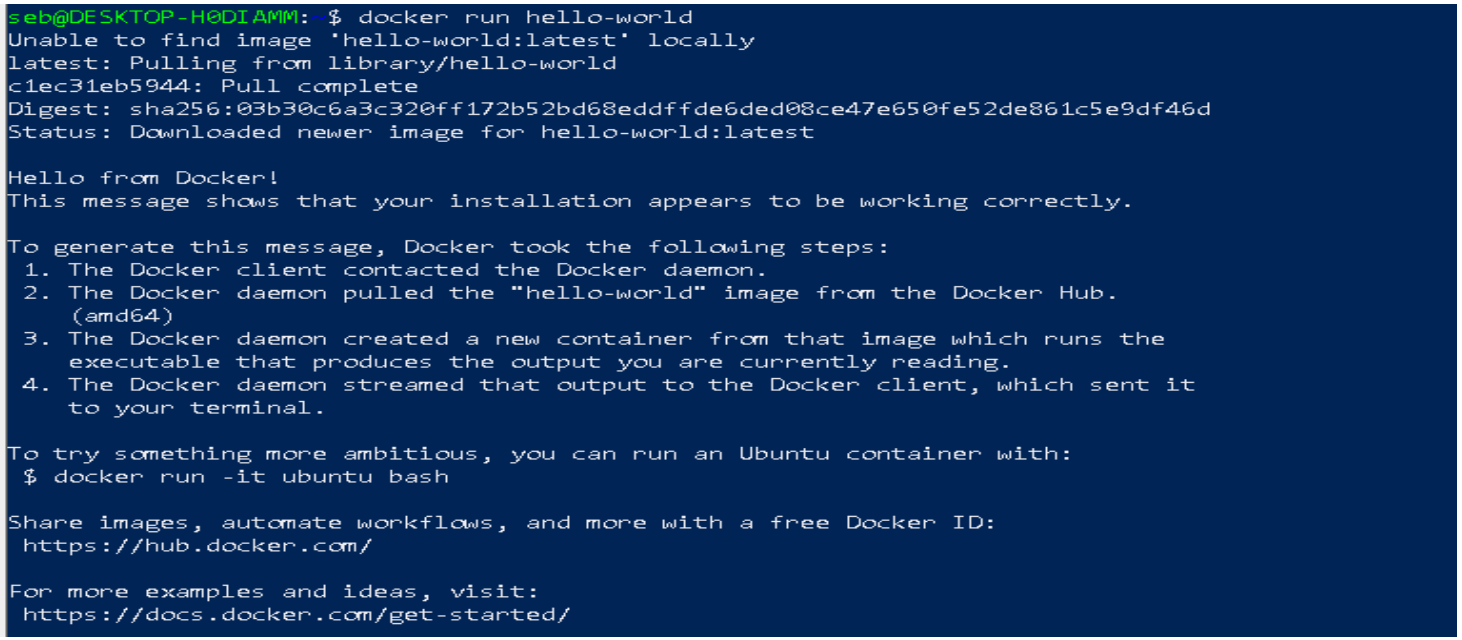
Docker Setup

For User running WSL (Windows Subsystem for Linux)

1. **Install wsl:**
    1. **Open Windows Powershell**
    2. **Type: wsl --install**
    3. **Then IF THIS IS YOUR FIRST TIME INSTALLING WSL Type: sudo apt update && sudo apt upgrade**
2. **Now Install docker engine: sudo apt install docker.io**
    1. **Install python: sudo apt install python3-pip**

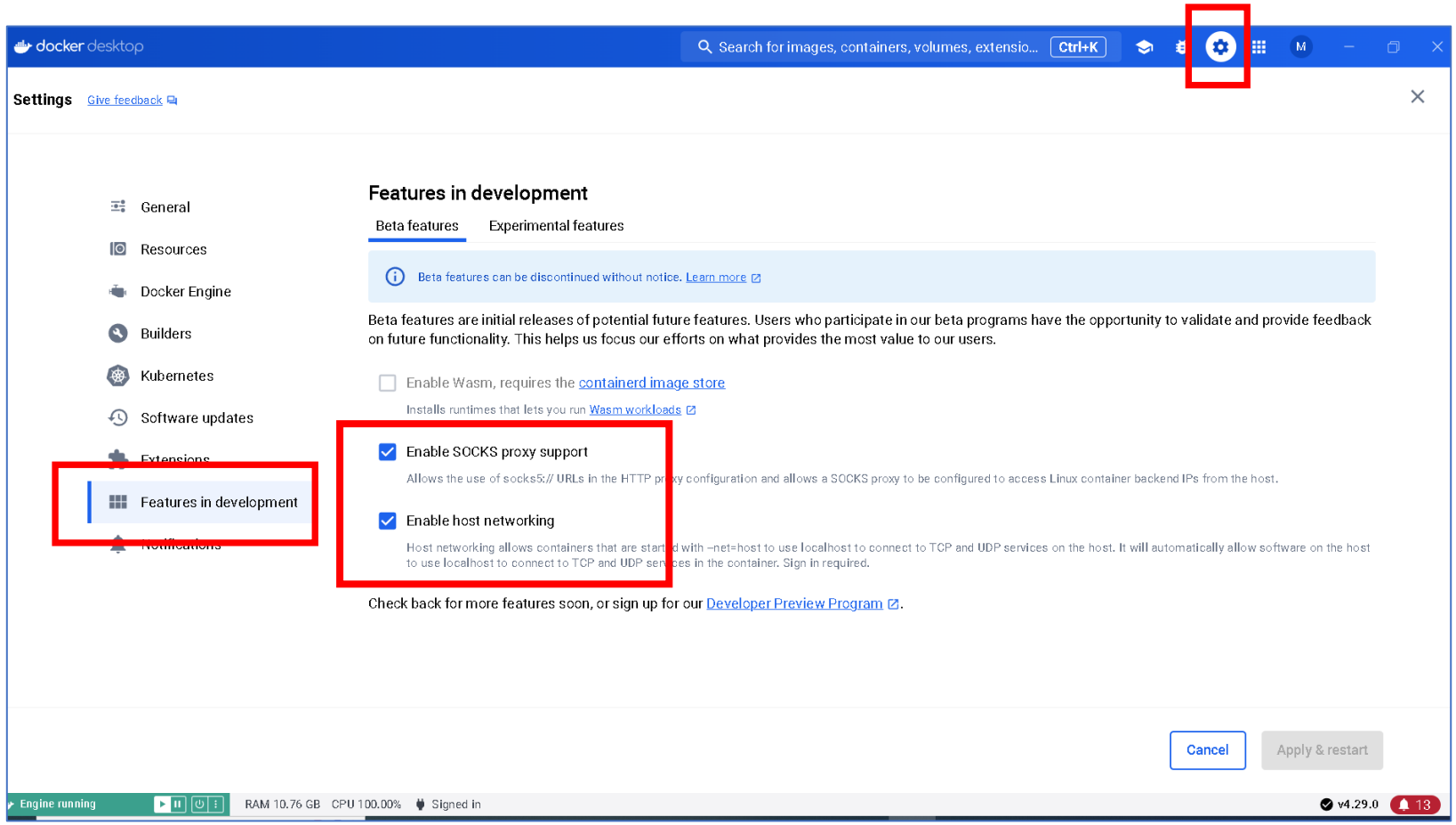
2. Test Docker Install Type: docker run hello-world

(If Docker is installed properly - Docker will pull the hello-world container and you will see a



Docker Desktop Setup

- Download the latest Docker Desktop for your computer

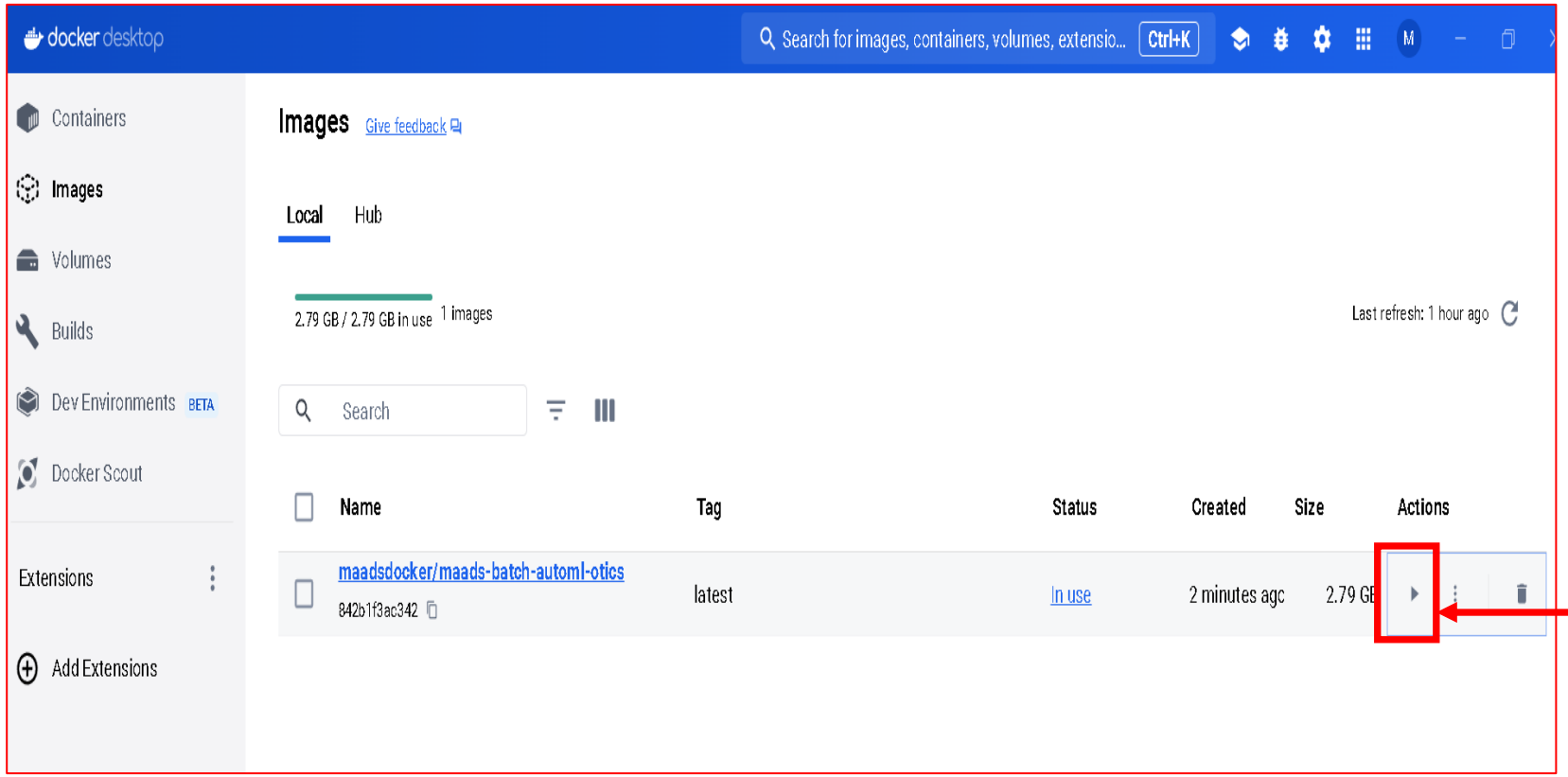


CHECK the following options:

1. Enable host networking
2. Enable SOCKS proxy support
3. Click APPLY and RESTART

Docker Desktop Setup

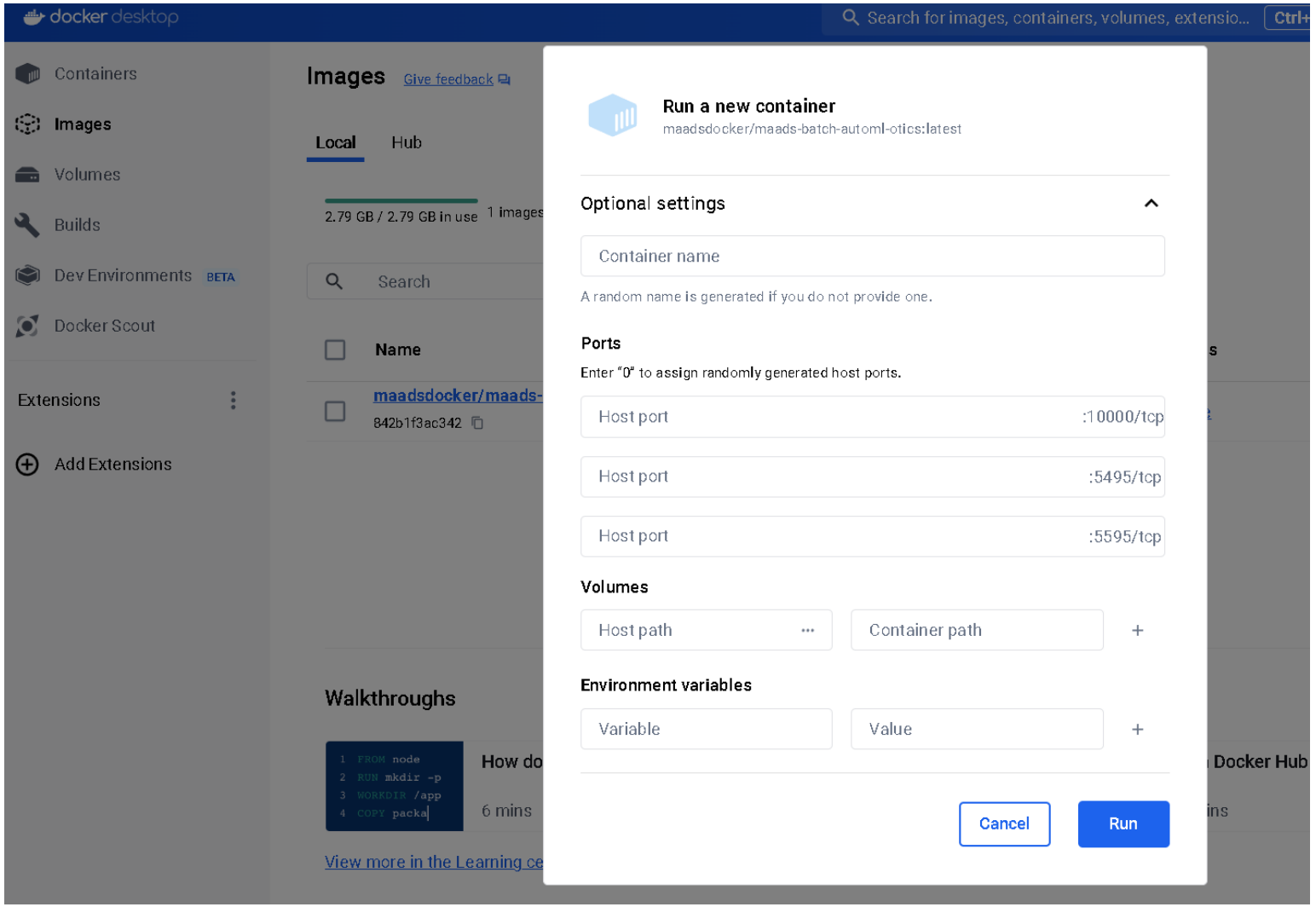
- Download the latest Docker Desktop for your computer



1. Login to your Docker hub account
2. Pull the docker container
3. Click
4. Enable SOCKS proxy support
5. Click RUN

Docker Desktop Setup

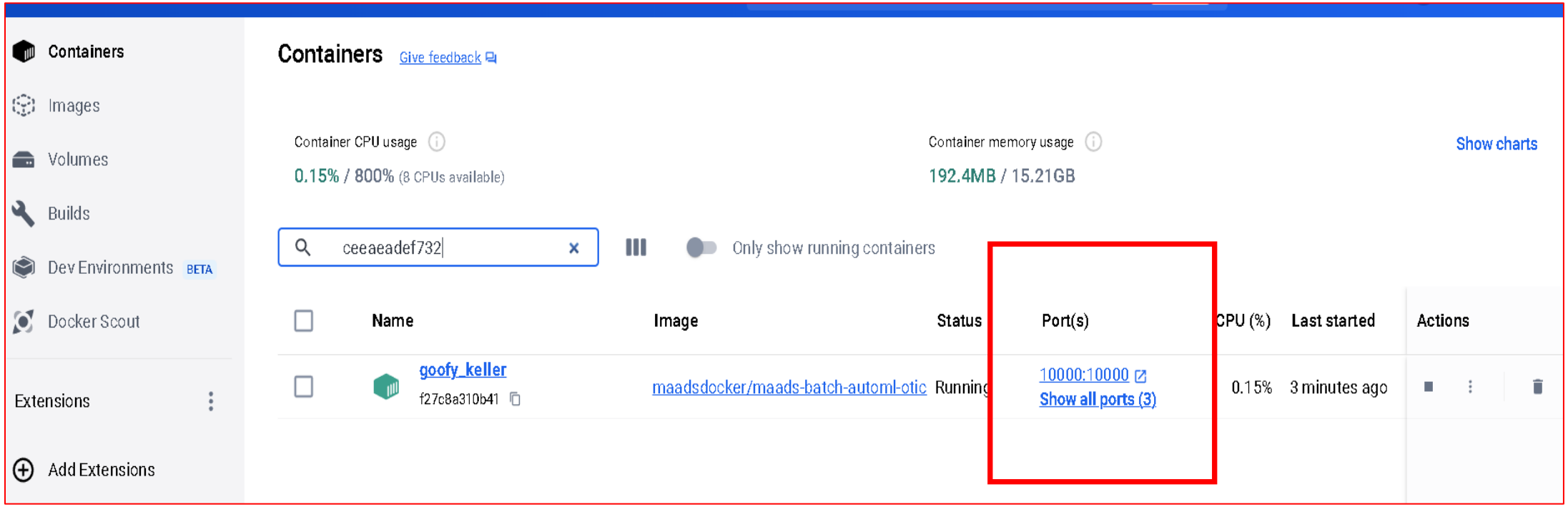
- Enter the Volumes and Environment Variables



- Enter ALL the Volume paths for HOST PATH and CONTAINER PATH in STEP 5
- ENTER the Environment Variables:
  - TRAININGPORT=5595
  - PREDICTIONPORT=5495
  - ABORTPORT=10000
  - COMPANYNAME=OTICS
  - MAXRUNTIME=20
  - MAINHOST=127.0.0.1
- ENTER the Host Port:
  - 10000
  - 5495
  - 5595
- Click RUN!

Docker Desktop Setup

- Enter the Volumes and Environment Variables



If successful you WILL see the PORTS section filled.

Docker Setup Common Issues and Resolution

1. **PROBLEM:** You may get Docker.sock permission denied ERROR
    1. **Try: sudo chmod 666 /var/run/docker.sock**
2. **REMOVE DOCKER AND RE-install: sudo apt remove docker.io and sudo apt autoremove**
3. **PROBLEM: Docker Daemon not running**
    1. **Try the following until Docker Daemon is running and you can run hello-world:**
        1. **sudo dockerd &**
    2. **Manually Start Docker:**
        a. sudo service docker start
        b. sudo systemctl start docker

4. PROBLEM: If you get a registry issue then type: echo "nameserver 8.8.8.8">/etc/resolv.conf

5. PROBLEM: If you get docker: open /var/lib/docker/tmp/GetImageBlob549217035: no such file or directory

a. Type: systemctl restart docker

6. PROBLEM: if you have mount overlay2 issues try: rm -rf ~/Library/Containers/com.docker.docker

7. PROBLEM: If you have "too many symbolink" error:

a. stop docker

b. sudo rm -rf /var/lib/docker

8. PROBLEM: IF you get "Deadline exceeded" or "failed to solve with frontend dockerfile.v0:

a. export DOCKER_BUILDKIT=0

b. export COMPOSE_DOCKER_CLI_BUILD=0

9. PROBLEM: If you get IP Tables issue then try: (failed to start daemon: Error initializing network controller: error obtaining controller instance: failed to create NAT chain DOCKER: iptables failed: iptables -t nat -N DOCKER: iptables/1.8.7 Failed to initialize nft: Protocol not supported**)**

a. sudo update-alternatives --set iptables /usr/sbin/iptables-legacy

b. sudo update-alternatives --set ip6tables /usr/sbin/ip6tables-legacy

Support

- Email: support@otics.ca