

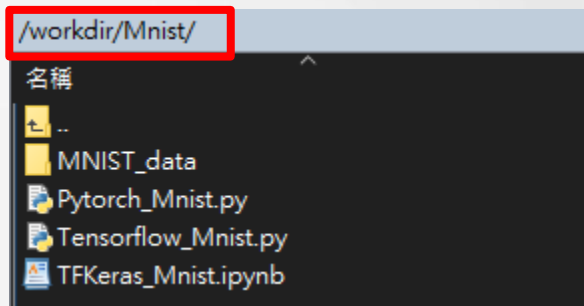
# Exercise 2

## Container Job

Video link : <https://youtu.be/WHiki4nYSP4>

# Container Job – uploading files and data

- Please download the zip file. Download link : <https://reurl.cc/V54QeA>
- Unzip the file and upload the folder to the server with FTP tool.  
(Upload and put MNIST folder in /workdir directory. )
- The files in Mnist folder :
  - Pytorch\_Mnist.py
  - Tensorflow\_Mnist.py
  - TFKeras\_Mnist.ipynb
  - MNIST\_data (folder)



## Exercise 2: The Implementation of MNIST Handwritten Digit Classification (Using Container Job)

- “Pytorch\_Mnist.py” in Mnist folder will be executed in this exercise.
- Build up a CNN model for classification of MNIST Handwritten digit.
- 60000 examples in training dataset and 10000 in test dataset
- Train model for 10 epochs
- Model evaluation - Print out Accuracy and plot Loss and Accuracy learning curves.

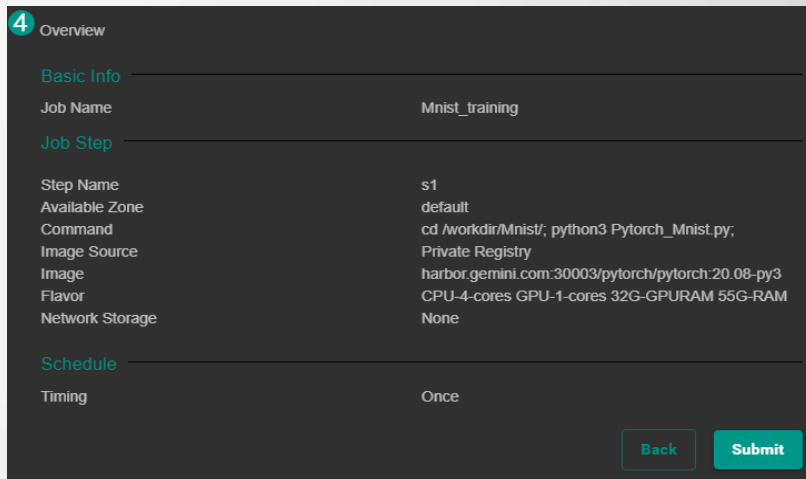
# Exercise 2: The Implementation of MNIST Handwritten Digit Classification (Using Container Job)

## 1. Create Container Job and execute “Pytorch\_Mnist.py”

(1) Please enter the information

Job Name	e.g. Pytorch Mnist Training
Step Name	e.g. Step 1
Available Zone	default
Command	<code>cd /workdir/Mnist/;</code> <code>python3 Pytorch_Mnist.py;</code>
Project	pytorch (using Pytorch Image)
Image	pytorch/pytorch
Image Tag	20.08-py3
Flavor	CPU-4-cores GPU-1-cores 32G-GPURAM 55G-RAM
Network Storage	None
Schedule Timing	Once

(2) Submit to complete the process



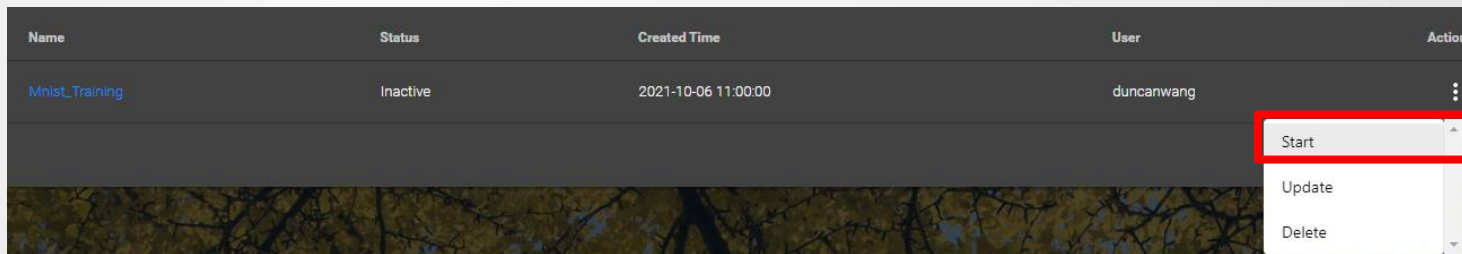
The screenshot shows a configuration page for a container job. It is divided into sections: Overview, Basic Info, Job Step, and Schedule. The 'Basic Info' section shows Job Name: Mnist\_training. The 'Job Step' section shows Step Name: s1, Available Zone: default, Command: cd /workdir/Mnist/; python3 Pytorch\_Mnist.py;, Image Source: Private Registry, Image: harbor.gemini.com:30003/pytorch/pytorch:20.08-py3, Flavor: CPU-4-cores GPU-1-cores 32G-GPURAM 55G-RAM, and Network Storage: None. The 'Schedule' section shows Timing: Once. At the bottom right, there are 'Back' and 'Submit' buttons.

4 Overview	
Basic Info	
Job Name	Mnist_training
Job Step	
Step Name	s1
Available Zone	default
Command	cd /workdir/Mnist/; python3 Pytorch_Mnist.py;
Image Source	Private Registry
Image	harbor.gemini.com:30003/pytorch/pytorch:20.08-py3
Flavor	CPU-4-cores GPU-1-cores 32G-GPURAM 55G-RAM
Network Storage	None
Schedule	
Timing	Once

Back Submit

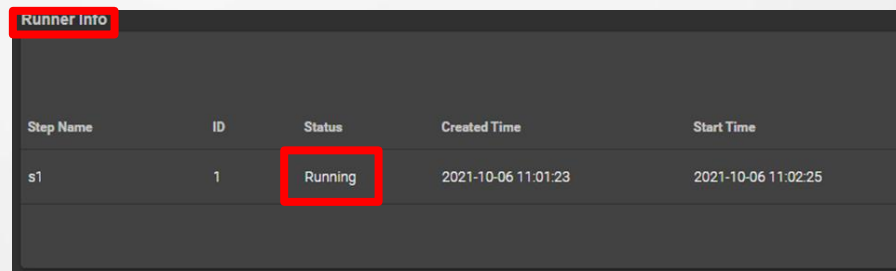
# Exercise 2: The Implementation of MNIST Handwritten Digit Classification (Using Container Job)

2. Select “start” to activate Container Job.



Name	Status	Created Time	User	Action
Mnist_Training	Inactive	2021-10-06 11:00:00	duncanwang	<b>Start</b> Update Delete

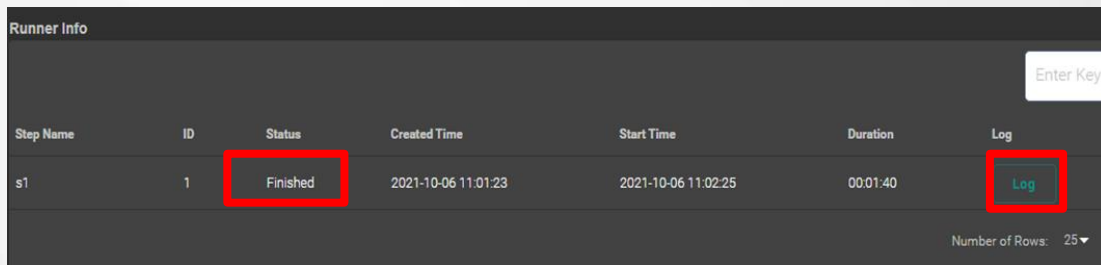
3. Switch to “Runner Info” and wait for the status to become “Running.”



Step Name	ID	Status	Created Time	Start Time
s1	1	<b>Running</b>	2021-10-06 11:01:23	2021-10-06 11:02:25

## Exercise 2: The Implementation of MNIST Handwritten Digit Classification (Using Container Job)

4. When status becomes “Finished”, click on “Log” to see the result.



Runner Info

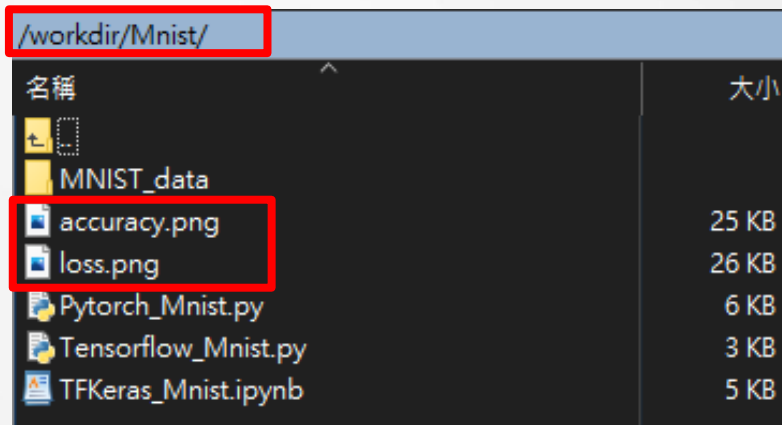
Step Name	ID	Status	Created Time	Start Time	Duration	Log
s1	1	Finished	2021-10-06 11:01:23	2021-10-06 11:02:25	00:01:40	Log

Number of Rows: 25

```
Epoch: 7 : train loss: 0.0429 | train accuracy:98.7050
| test loss: 0.0425 | test accuracy:98.6300
Epoch: 8 : train loss: 0.0391 | train accuracy:98.8283
| test loss: 0.0451 | test accuracy:98.4600
Epoch: 9 : train loss: 0.0358 | train accuracy:98.9183
| test loss: 0.0380 | test accuracy:98.7000
Epoch: 10 : train loss: 0.0326 | train accuracy:98.9750
| test loss: 0.0392 | test accuracy:98.7100
Finished Training
```

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- “Loss.png” and “accuracy.png” will be produced after model training and can be found in the working directory “Mnist” folder by using FTP tool.



名稱	大小
MNIST_data	
accuracy.png	25 KB
loss.png	26 KB
Pytorch_Mnist.py	6 KB
Tensorflow_Mnist.py	3 KB
TFkeras_Mnist.ipynb	5 KB

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6. The decline of loss and the improvement of accuracy when predicting train data and test data during 10 epochs of training can be observed.

