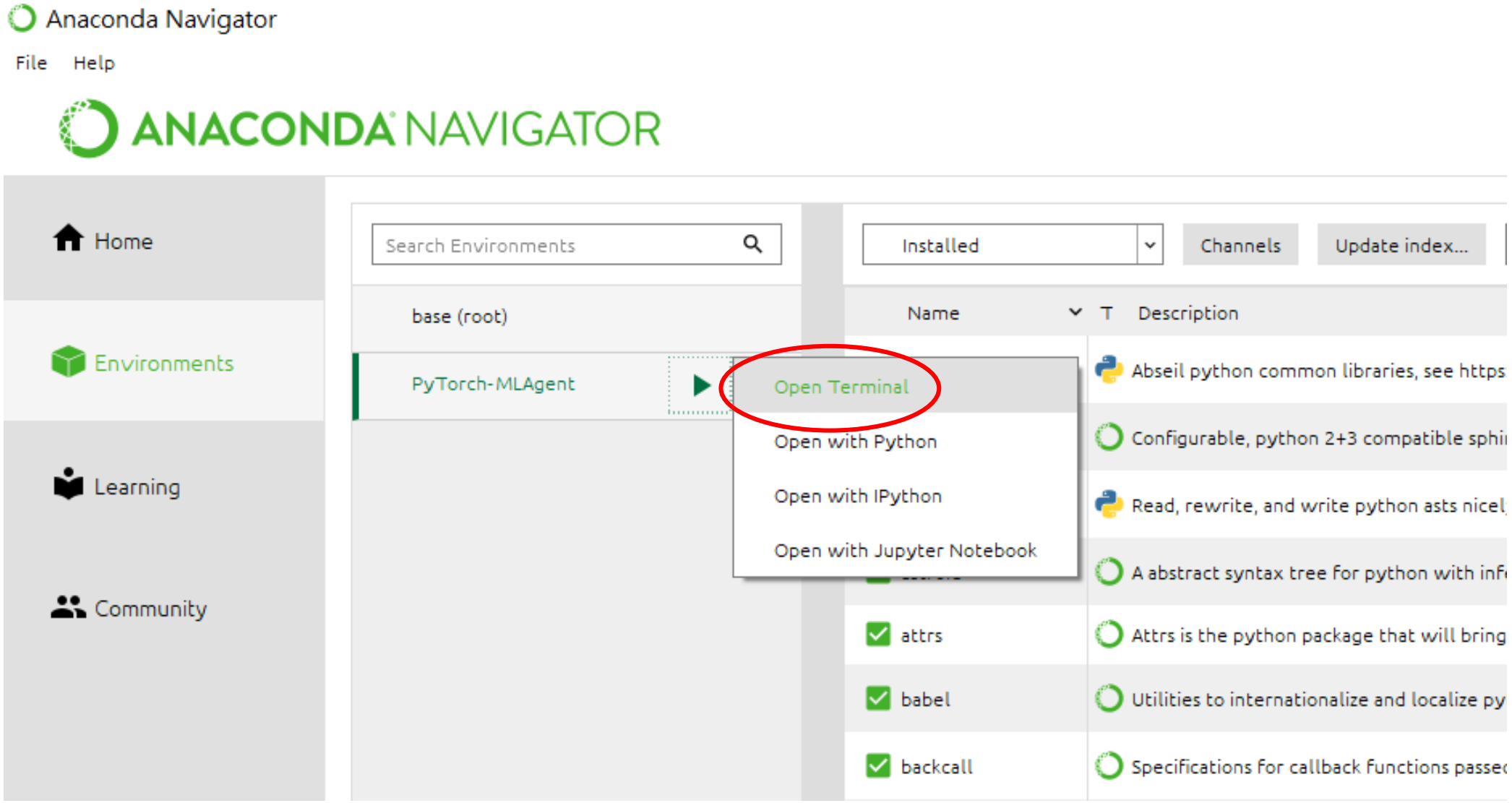
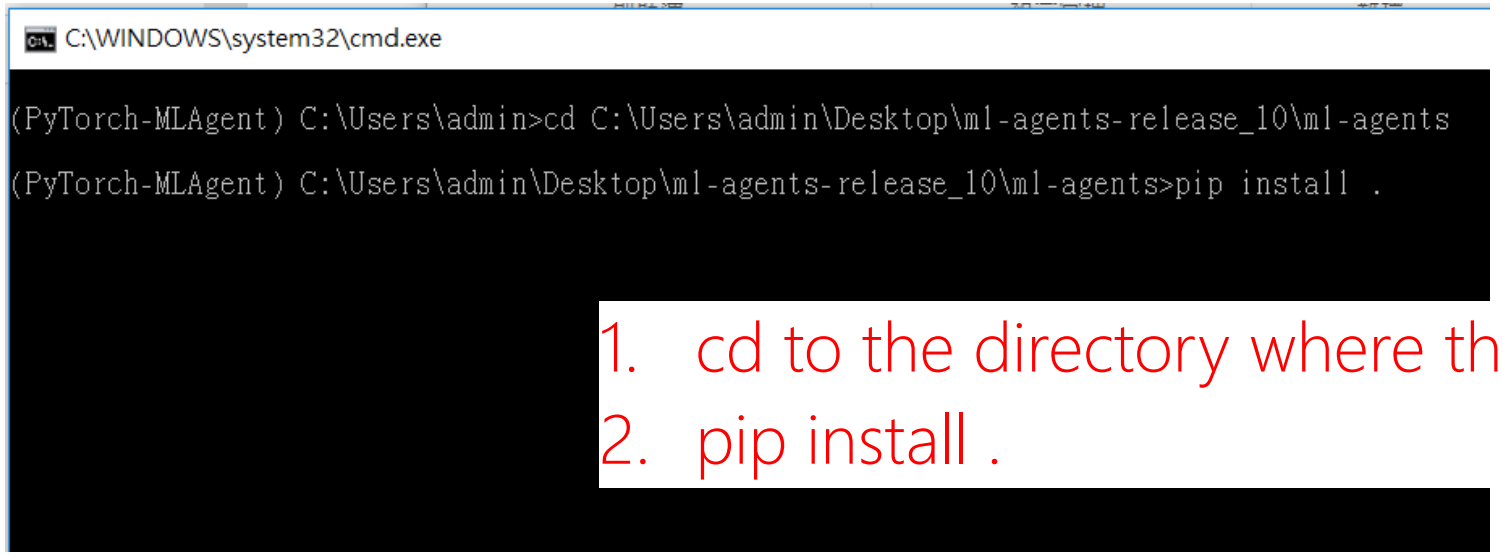
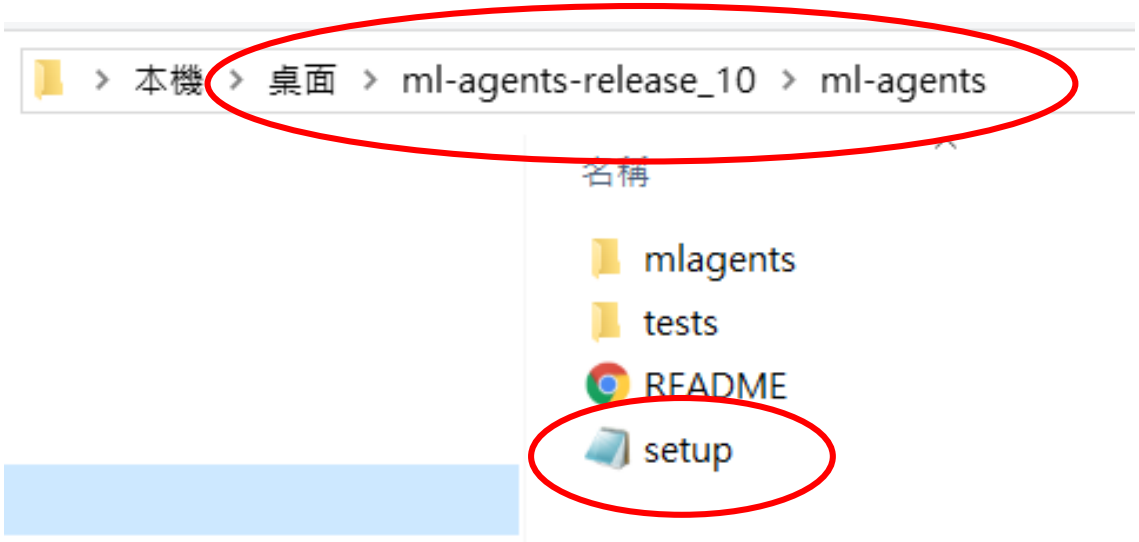
1. Install ML Agent to Anaconda



1. Install ML Agent to Anaconda



1. cd to the directory where the setup.py is located
2. pip install .

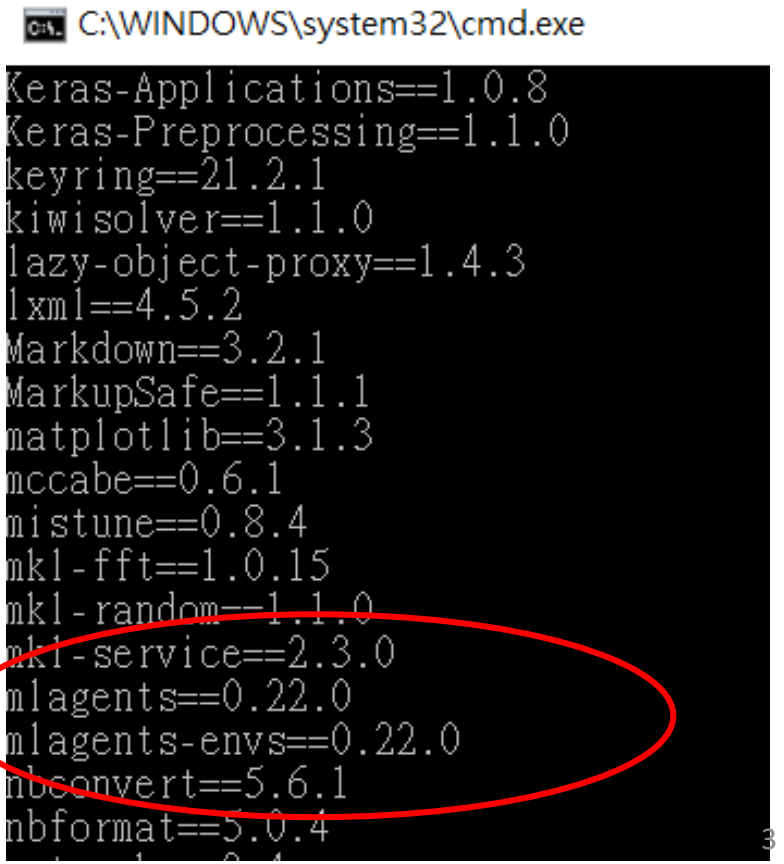


1. Install ML Agent to Anaconda

Type “pip freeze” to confirm

C:\WINDOWS\system32\cmd.exe

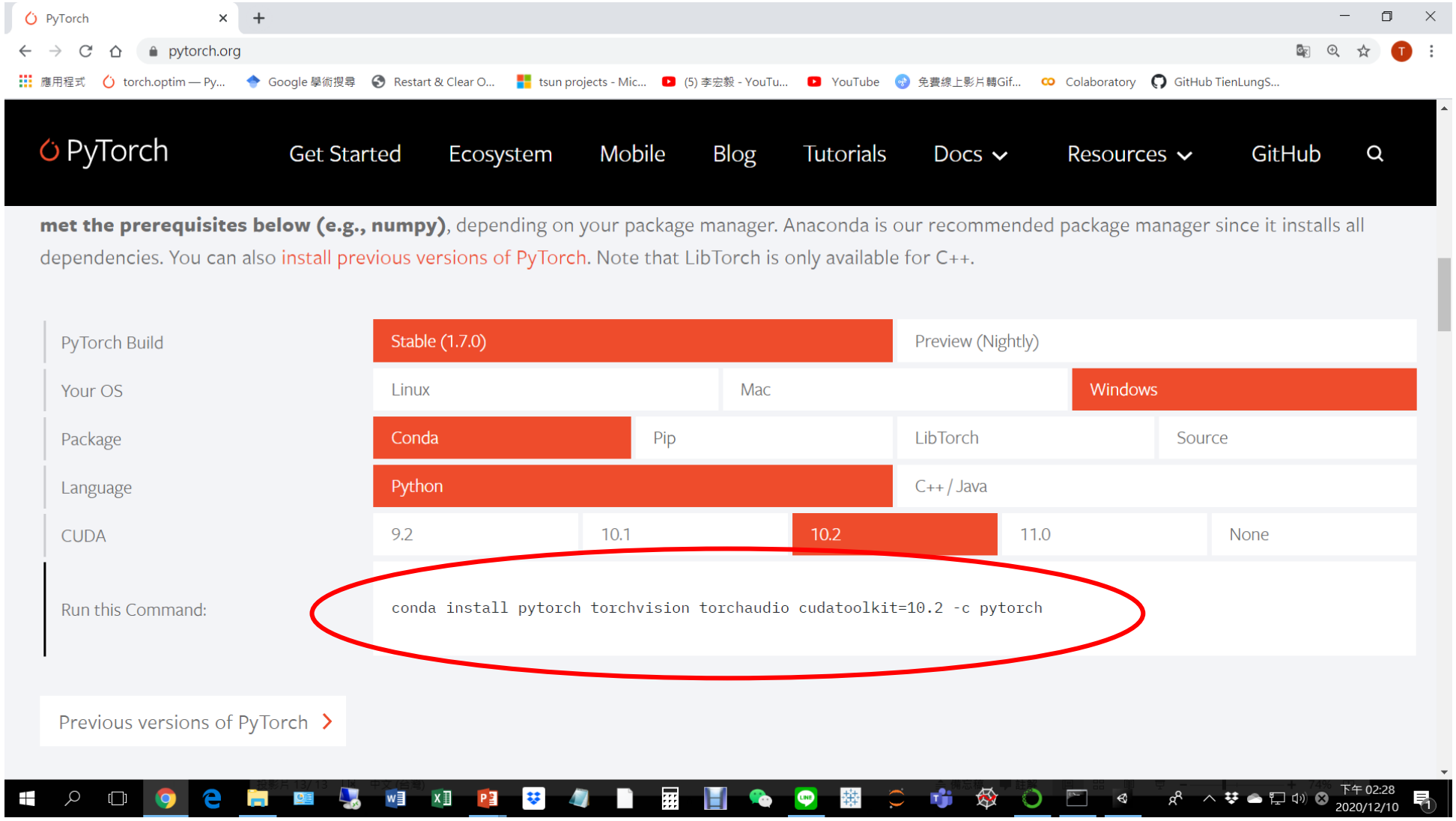
```
(PyTorch-MLAgent) C:\Users\admin\Desktop\ml-agents-release_10\ml-agents>pip freeze
absl-py==0.9.0
alabaster==0.7.12
astor==0.8.1
astroid==2.4.2
attrs==19.3.0
Babel==2.8.0
backcall==0.1.0
bleach==3.1.1
boto3==1.14.33
botocore==1.17.33
brotlipy==0.7.0
cachetools==4.0.0
cattrs==1.0.0
```



(Update PyTorch to 1.6.0 or later)

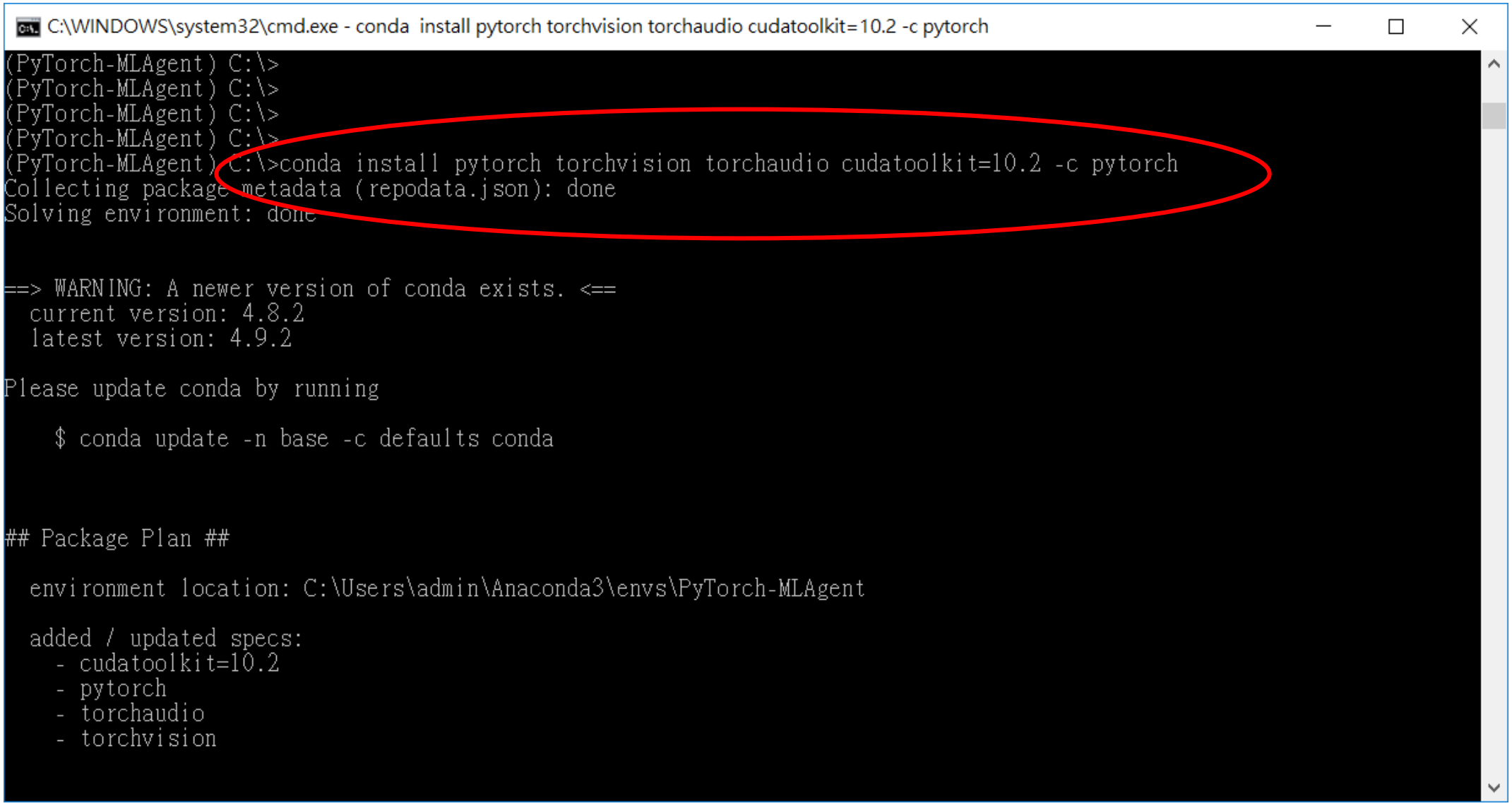
```
toml==0.10.1
torch==1.7.0
torchaudio==0.7.0
torchvision==0.8.1
tornado==6.0.3
tqdm==4.47.0
traitlets==4.3.3
```

(Update PyTorch to 1.6.0 or later)

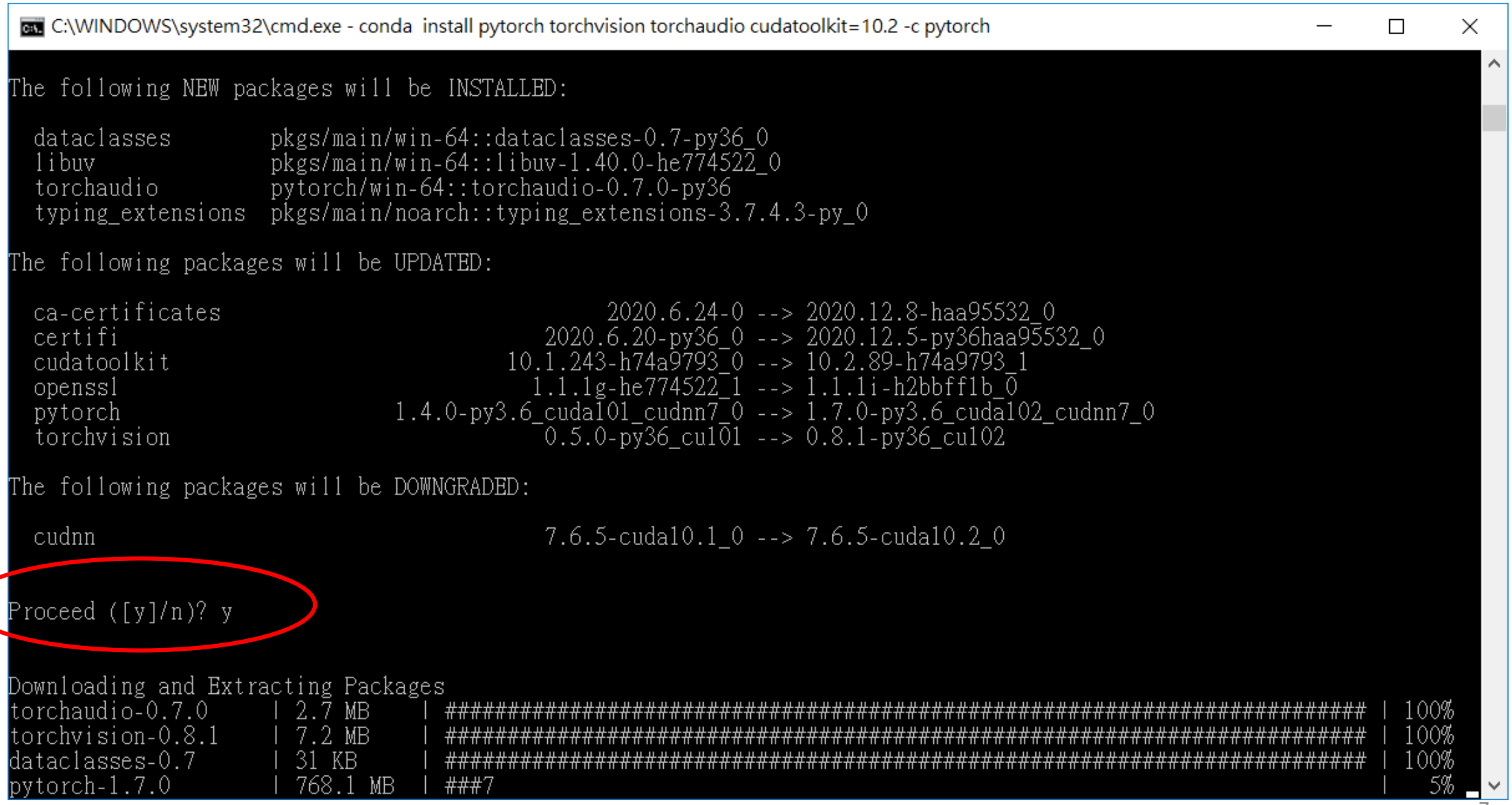


https://pytorch.org/

(Update PyTorch to 1.6.0 or later)



(Update PyTorch to 1.6.0 or later)



2. Prepare training configure file

main ▾ RL-Mobile-Robot / ReachGoalAvoidObstacles /

TienLungSun Delete test env.unitypackage

..

2020.12.19 PPO.unitypackage	Add files via upload
2021.4.28 Test scene.unitypackage	Add files via upload
Car_Agent_s7.cs	Add files via upload
Car_Agent_s8.cs	Add files via upload
HW1 Build a training VE in Unity	Update HW1 Build a training VE in Unity
HW2 ML Agent	Update HW2 ML Agent
HW3 Train and test ML Agent	Update HW3 Train and test ML Agent
MobileRobot.yaml	Add files via upload
ReadMe	Update ReadMe

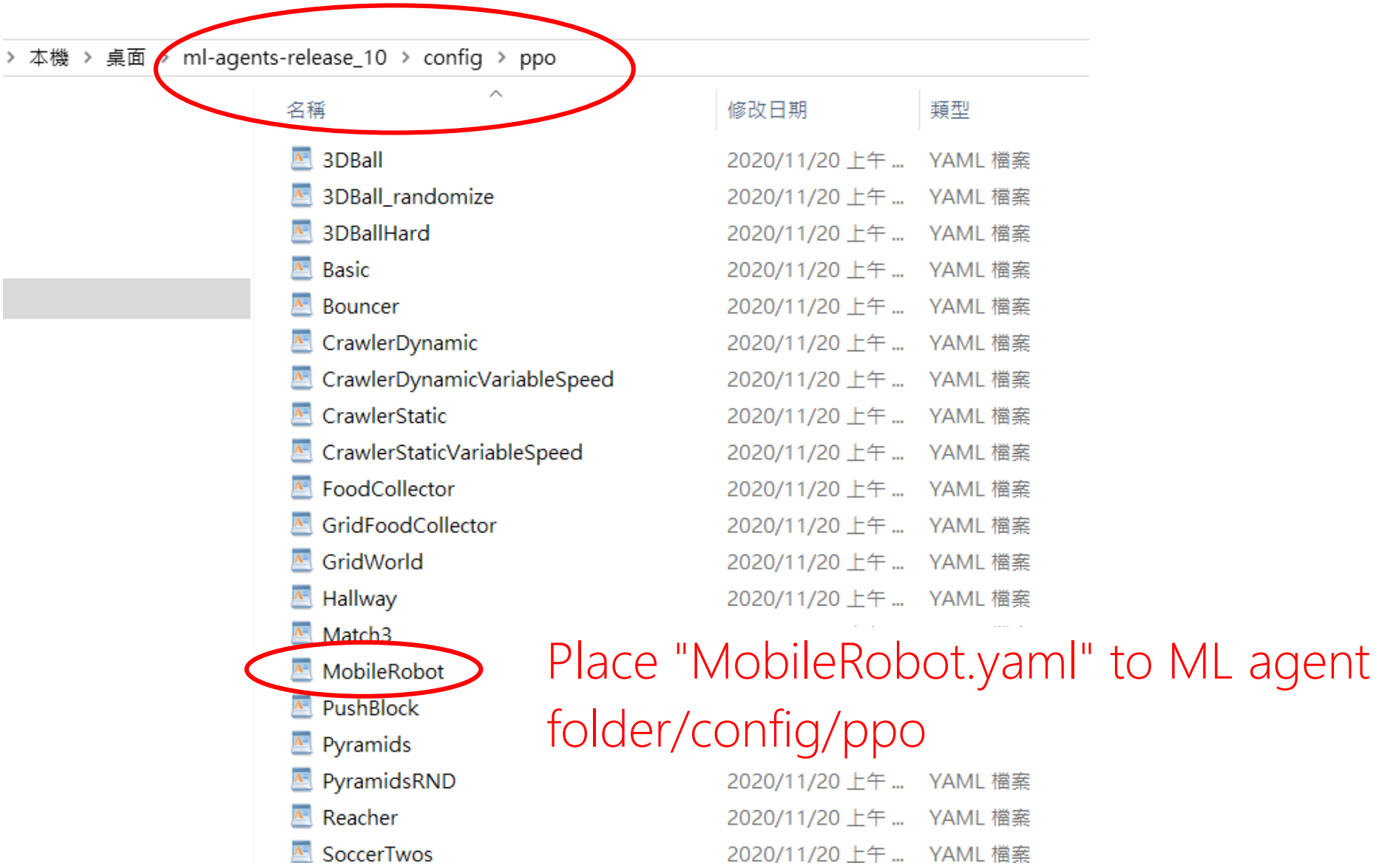
2. Prepare training configure file

26 lines (26 sloc) | 593 Bytes

```yaml
behaviors:
  MobileRobot:
    trainer_type: ppo
    hyperparameters:
      batch_size: 2048
      buffer_size: 20480
      learning_rate: 0.0003
      beta: 0.005
      epsilon: 0.2
      lambd: 0.95
      num_epoch: 3
      learning_rate_schedule: linear
    network_settings:
      normalize: true
      hidden_units: 512
      num_layers: 3
      vis_encode_type: simple
    reward_signals:
      extrinsic:
        gamma: 0.995
        strength: 1.0
    keep_checkpoints: 5
    max_steps: 5000000
    time_horizon: 1000
    summary_freq: 30000
    threaded: true
```

Copy to a text file and rename the text file as "MobileRobot.yaml"

2. Prepare training configure file

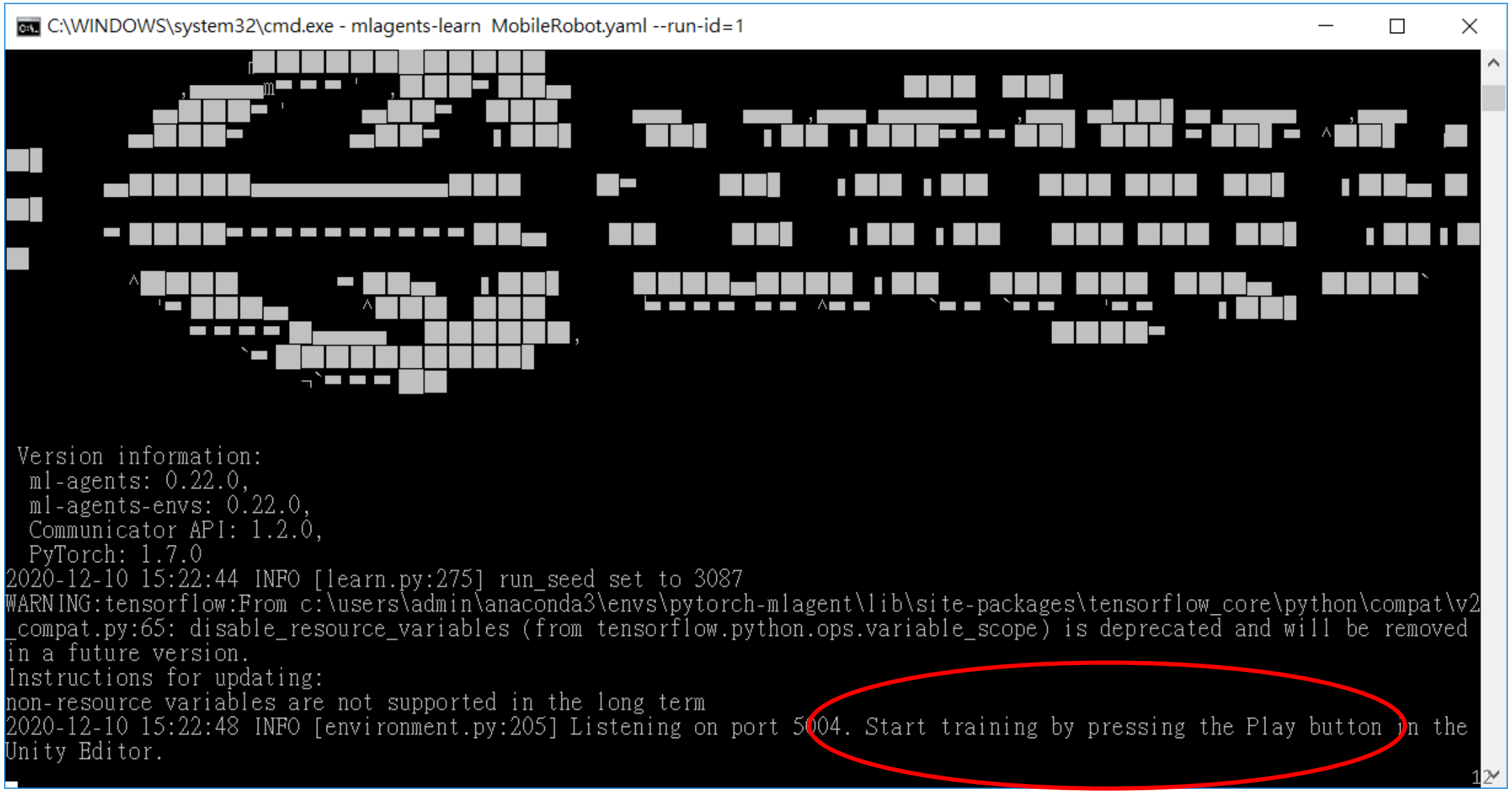


Place "MobileRobot.yaml" to ML agent folder/config/ppo

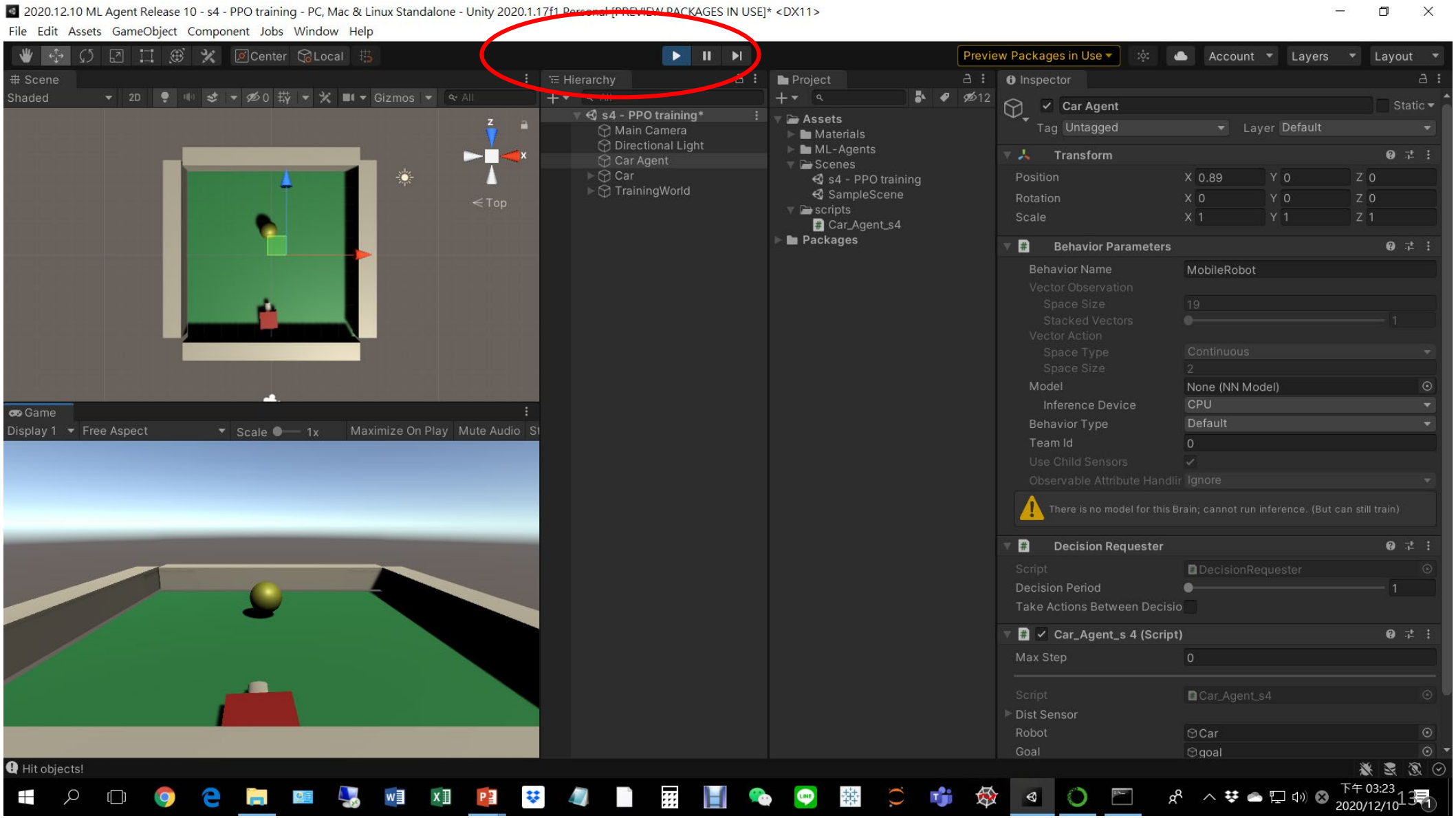
3. Start train

1. cd C:\...\ml-agents-release_10\config\ppo (the folder of your configuration file)
2. mlagents-learn MobilRobot.yaml --run-id=1 --force

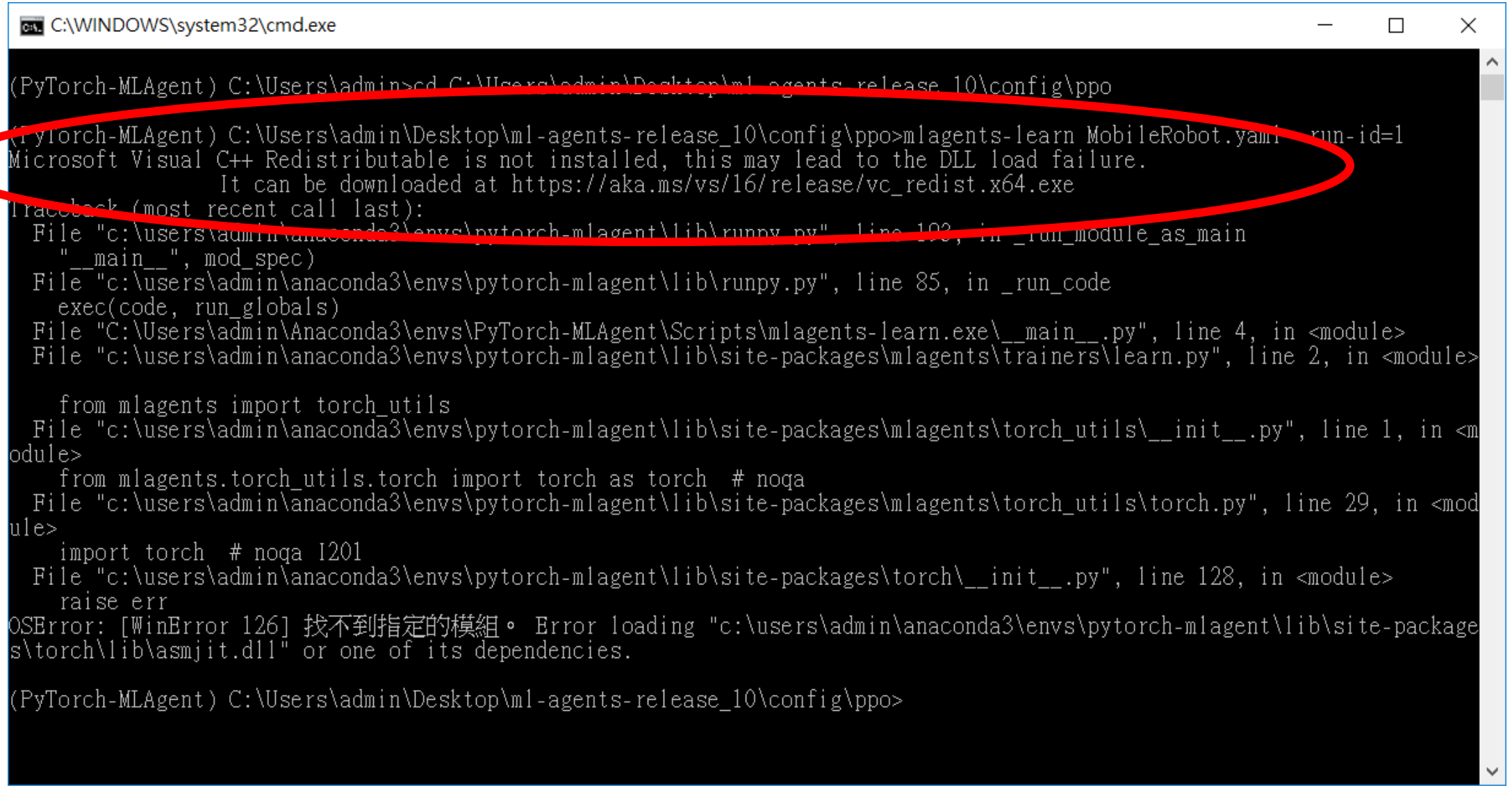
3. Start train



3. Start train



(You might need to download MS VC redistributable)

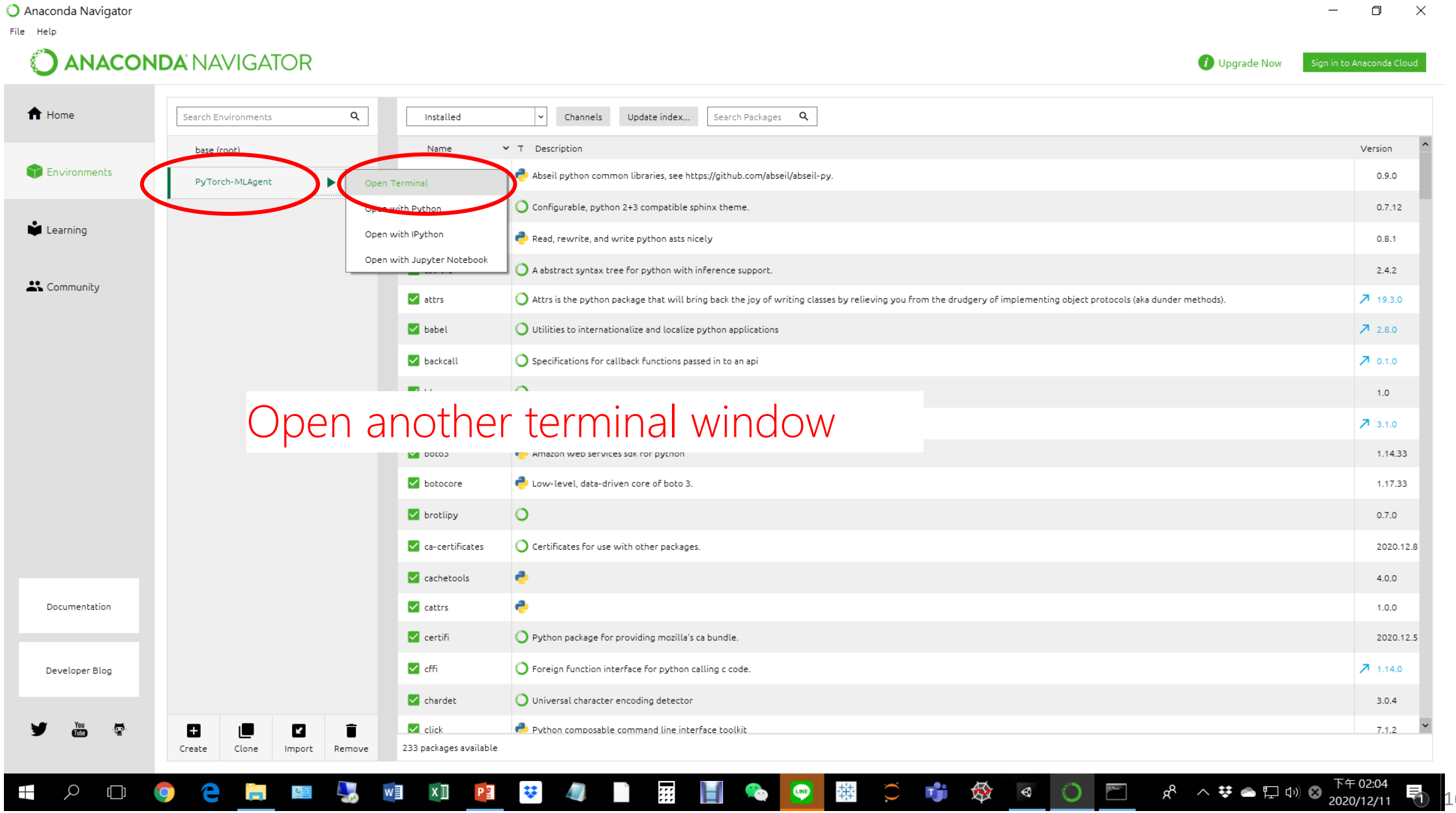


https://aka.ms/vs/16/release/vc_redist.x64.exe

4. Training

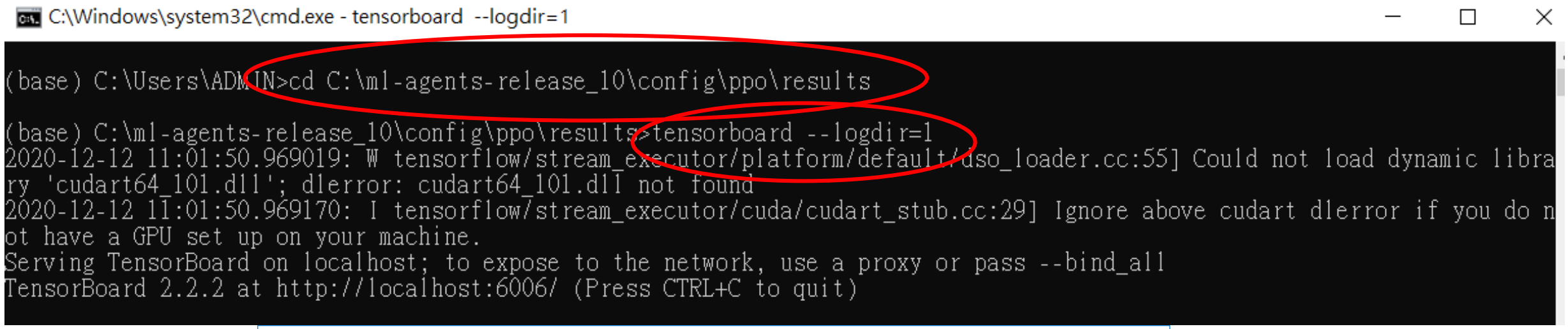

C:\Windows\system32\cmd.exe - mlagents-learn MobileRobot.yaml --run-id=2
beta: 0.005
epsilon: 0.2
lambd: 0.95
num_epoch: 3
learning_rate_schedule: linear
network_settings:
normalize: True
hidden_units: 512
num_layers: 3
vis_encode_type: simple
memory: None
reward_signals:
extrinsic:
gamma: 0.995
strength: 1.0
init_path: None
keep_checkpoints: 5
checkpoint_interval: 500000
max_steps: 7000000
time_horizon: 1000
summary_freq: 30000
threaded: True
self_play: None
behavioral_cloning: None
framework: pytorch
2020-12-12 11:39:12 INFO [stats.py:139] MobileRobot. Step: 30000. Time Elapsed: 56.278 s. No episode was completed since last summary. Training.
2020-12-12 11:39:49 INFO [stats.py:139] MobileRobot. Step: 60000. Time Elapsed: 93.340 s. Mean Reward: -14.130. Std of Reward: 10.538. Training.
vis_encode_type: simple
reward_signals:
extrinsic:
gamma: 0.995
strength: 1.0
keep_checkpoints: 5
max_steps: 7000000
time_horizon: 1000
summary_freq: 30000
threaded: true

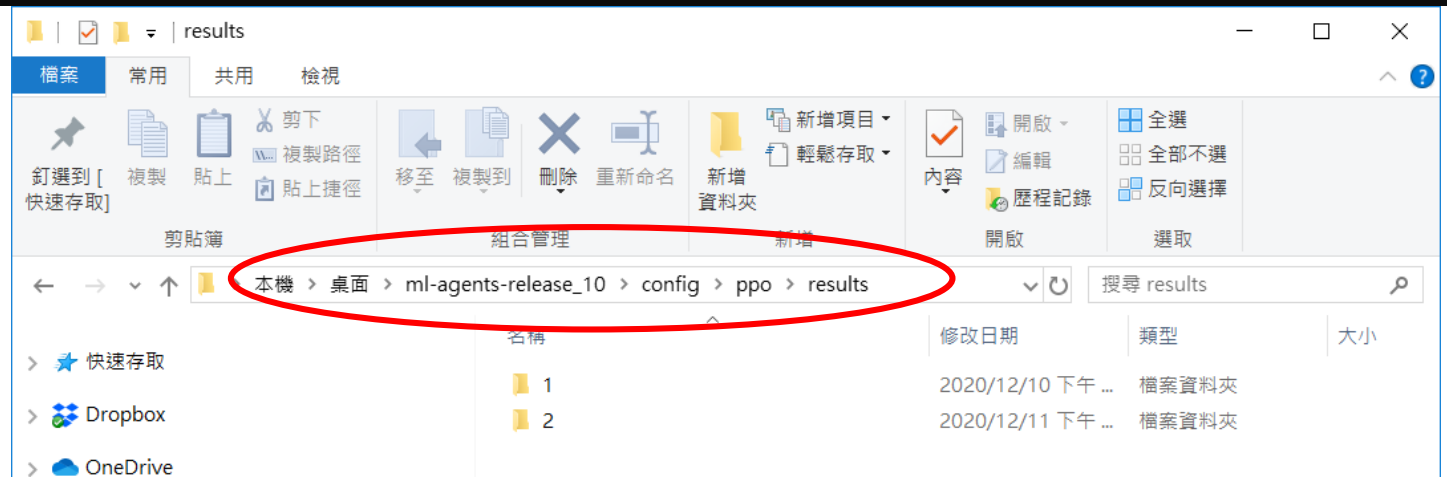
5. Monitor training performance



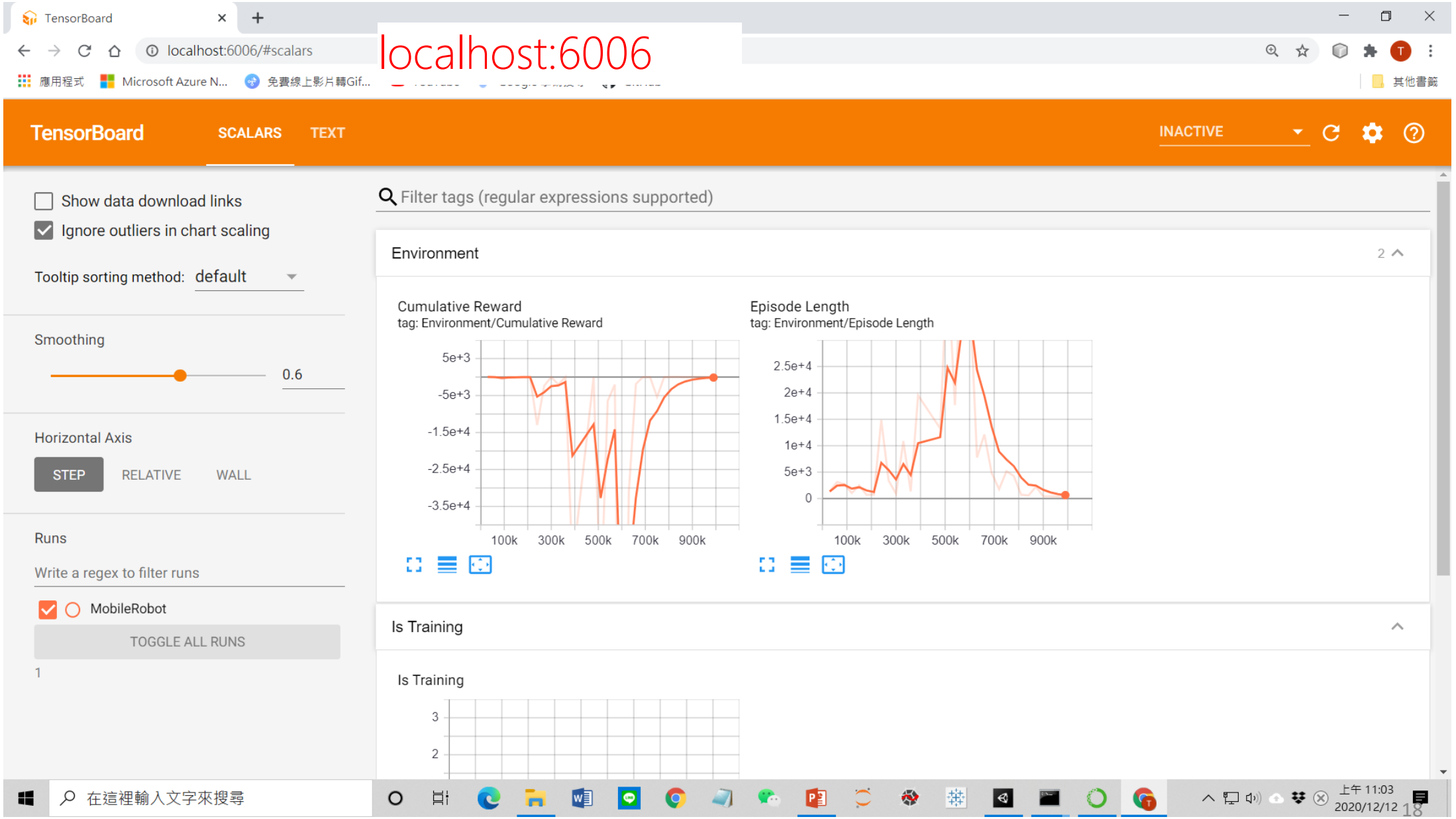
5. Monitor training performance

1. cd C:\ml-agents-release-10\config\ppo\results (The results folder)
2. tensorboard --logdir=1

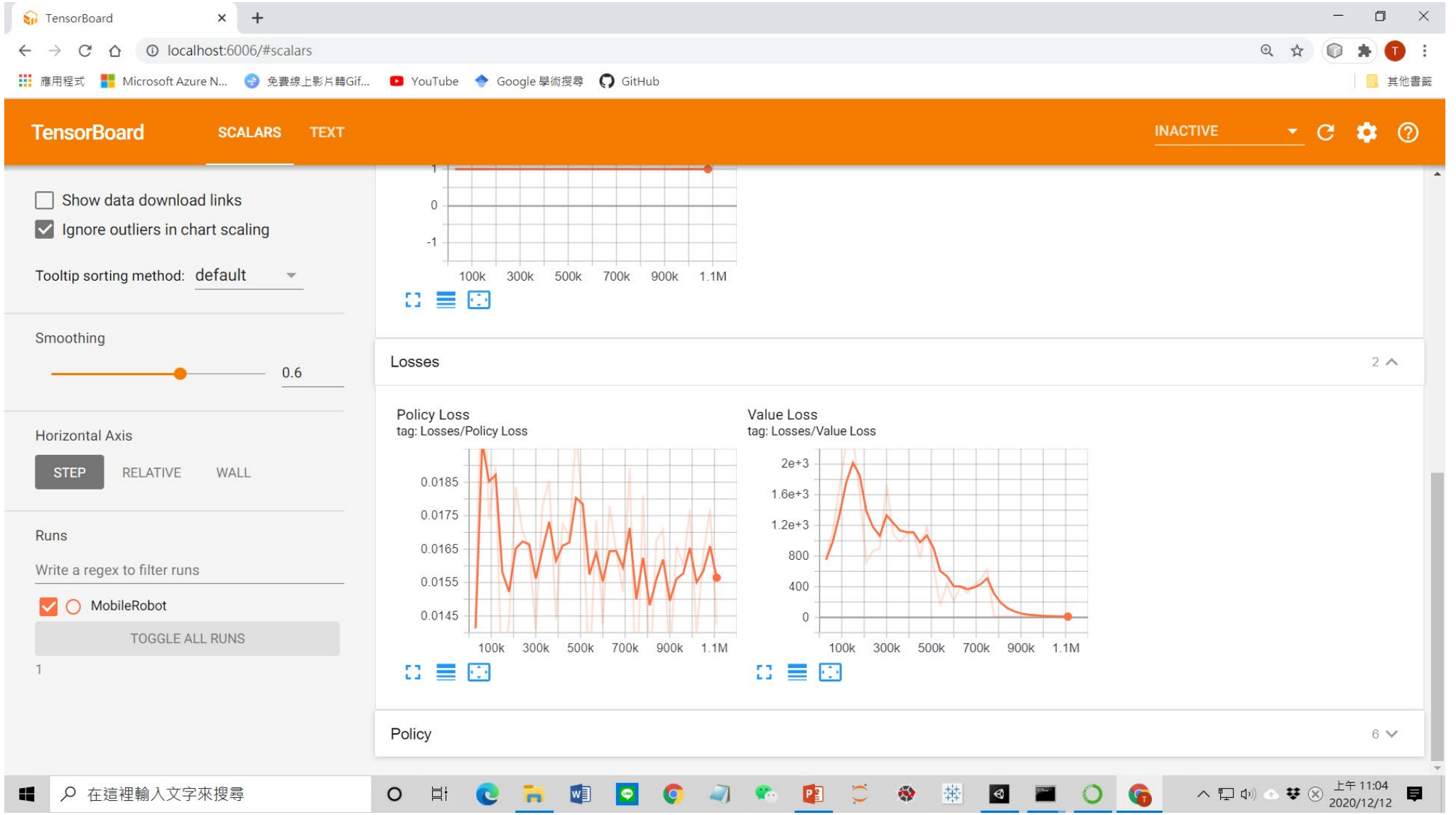




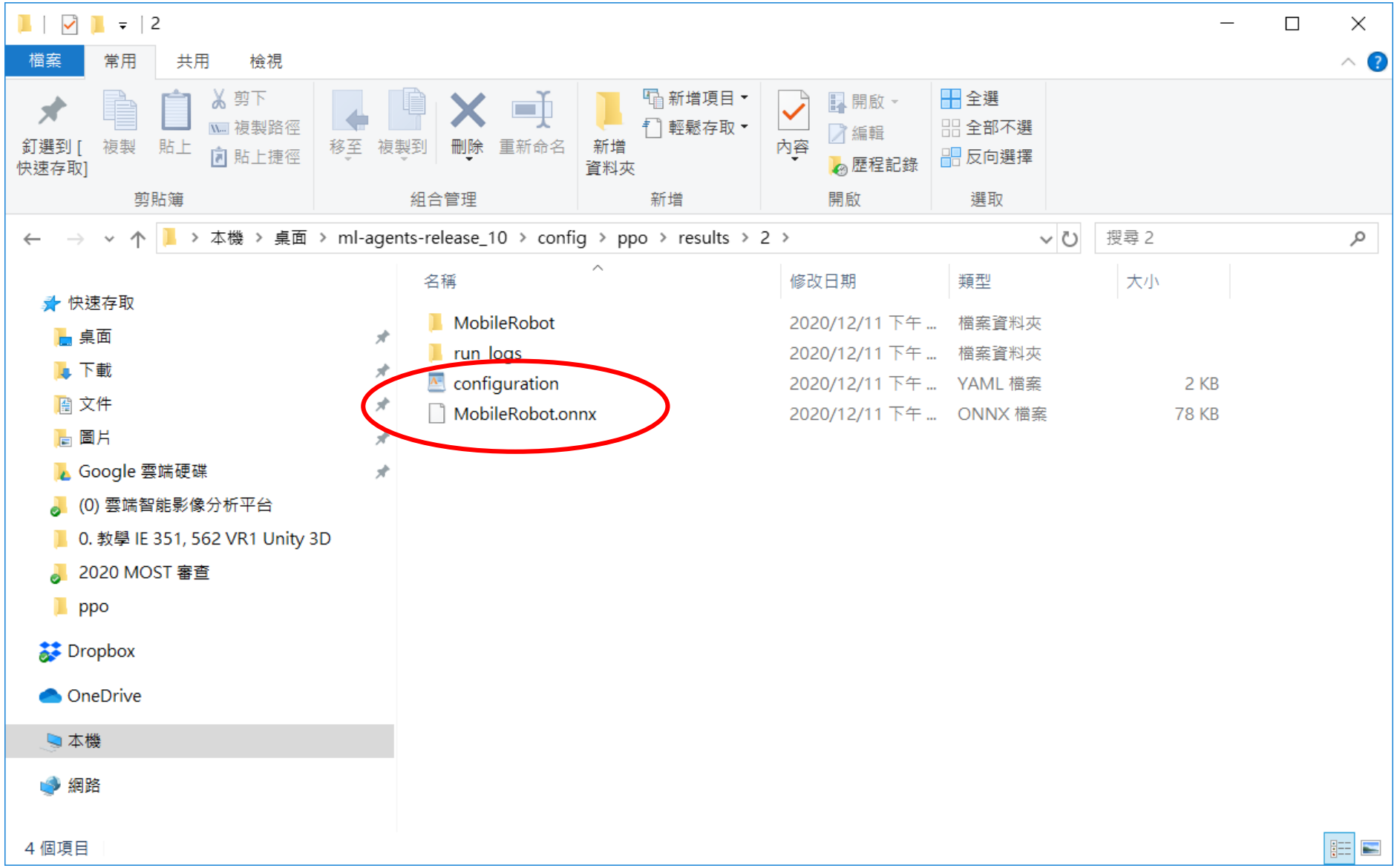
5. Monitor training performance



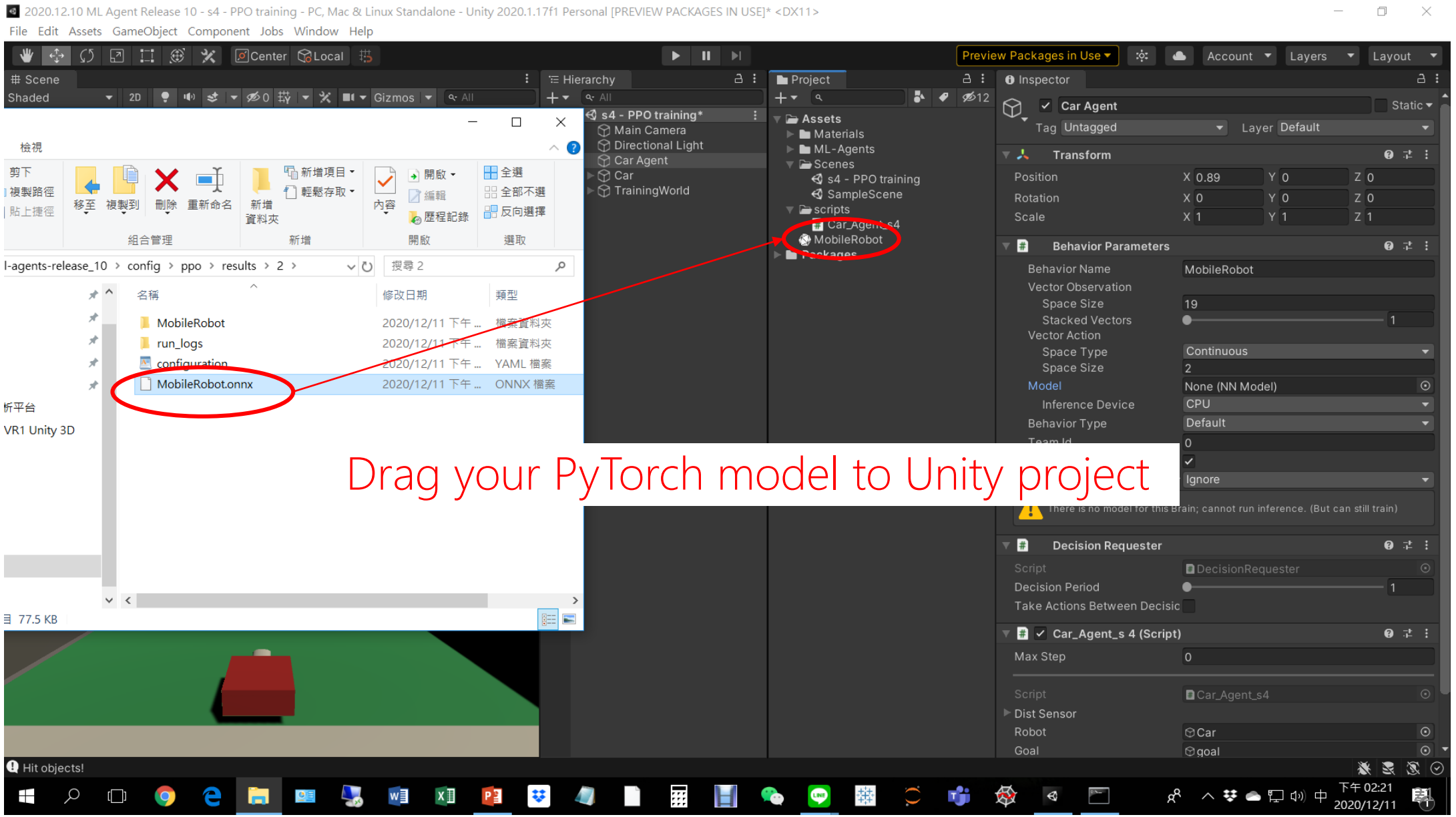
5. Monitor training performance



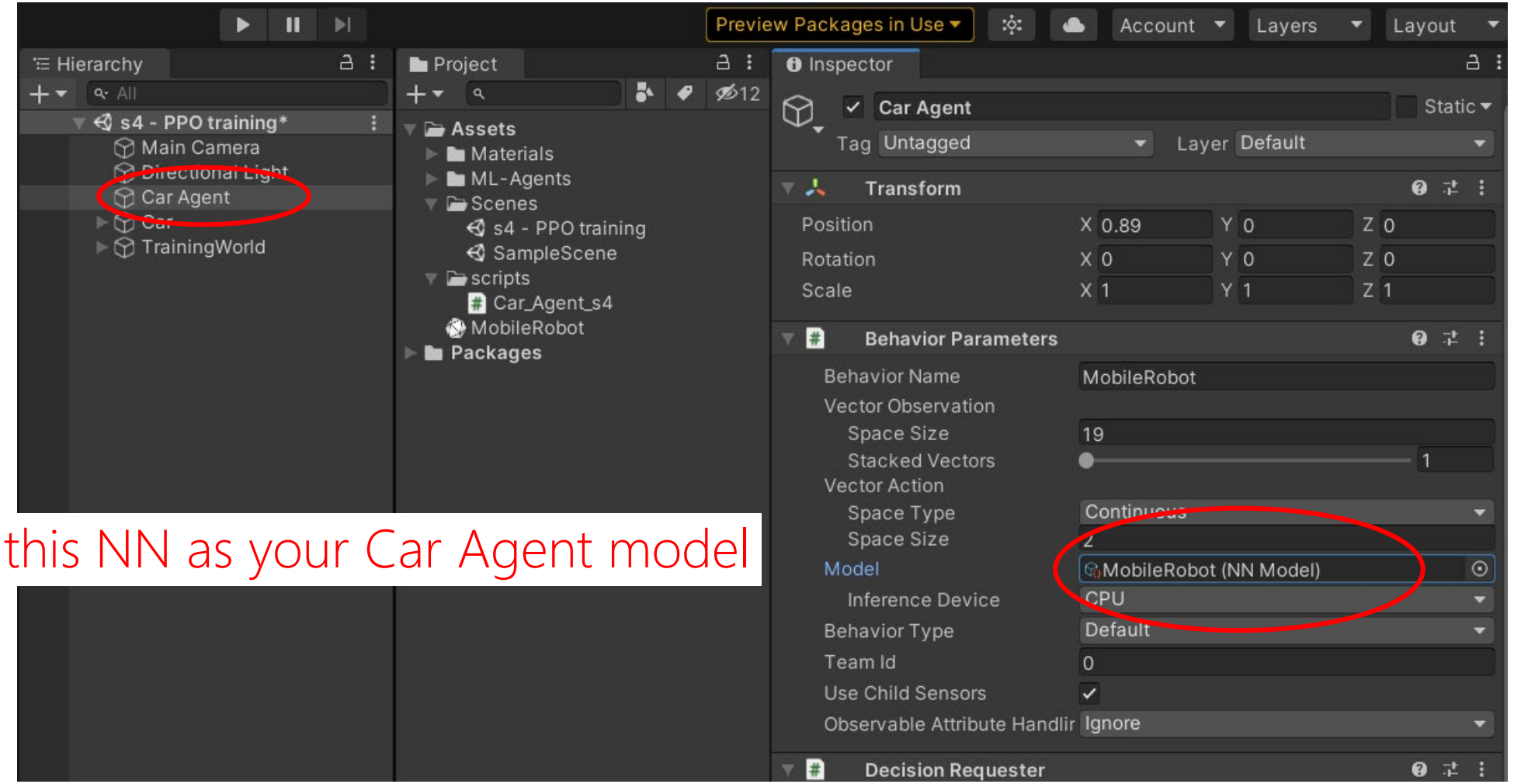
6. Finish training



7. Test

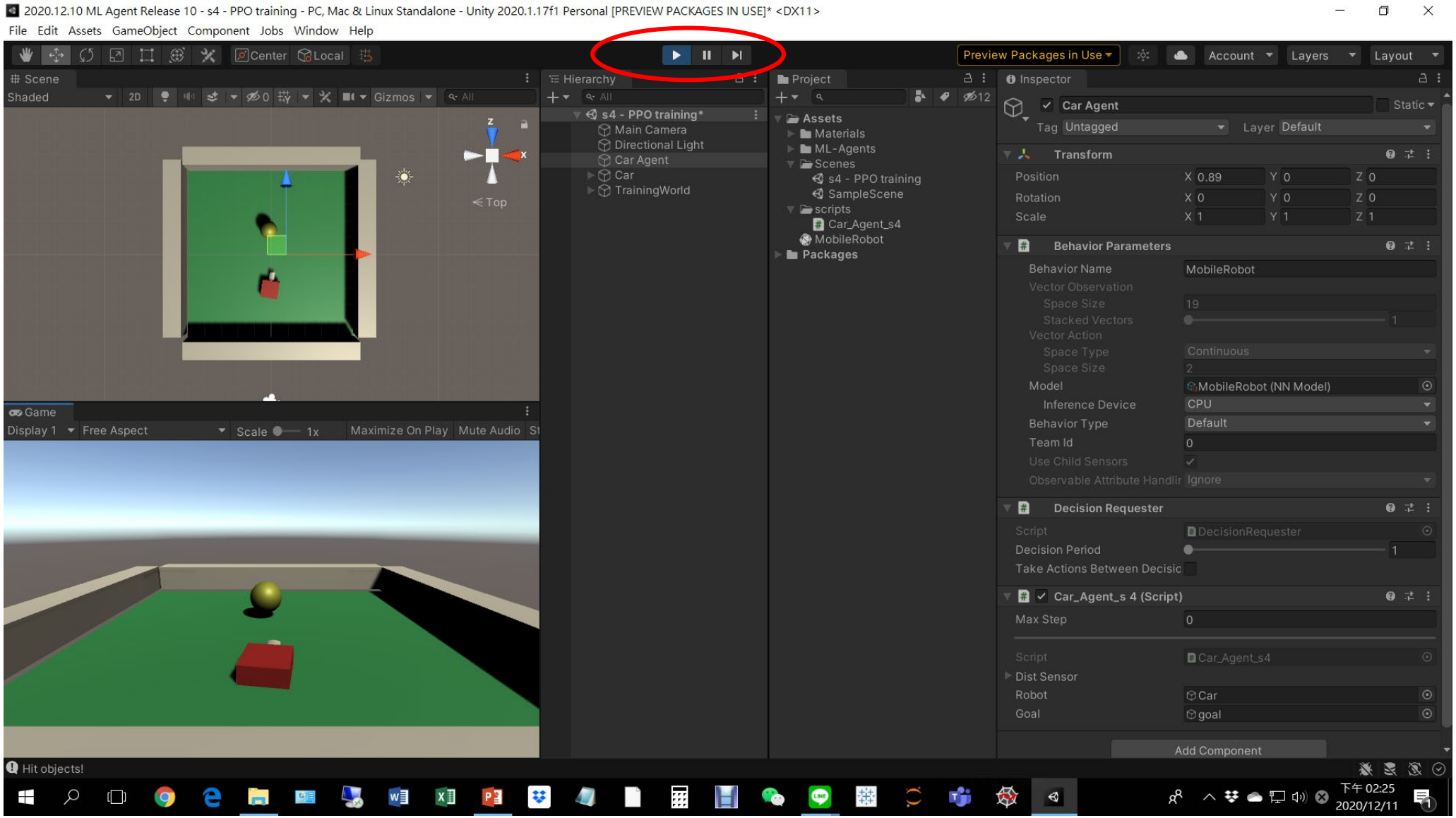

2020.12.10 ML Agent Release 10 - s4 - PPO training - PC, Mac & Linux Standalone - Unity 2020.1.17f1 Personal [PREVIEW PACKAGES IN USE]* <DX11>
File Edit Assets GameObject Component Jobs Window Help
Preview Packages in Use
Account
Layers
Layout
Hierarchy
s4 - PPO training*
Main Camera
Directional Light
Car Agent
Car
TrainingWorld
Project
Assets
Materials
ML-Agents
Scenes
s4 - PPO training
SampleScene
scripts
MobileRobot
Inspector
Car Agent
Static
Tag Untagged
Layer Default
Transform
Position
Rotation
Scale
Behavior Parameters
Behavior Name MobileRobot
Vector Observation
Space Size 19
Stacked Vectors
Vector Action
Space Type Continuous
Space Size 2
Model None (NN Model)
Inference Device CPU
Behavior Type Default
Ignore
There is no model for this Brain; cannot run inference. (But can still train)
Decision Requester
Script DecisionRequester
Decision Period
Car_Agent_s 4 (Script)
Max Step 0
Script Car_Agent_s4
Dist Sensor
Robot Car
Goal goal
MobileRobot.onnx
2020/12/11 下午 ... ONNX 檔案
Drag your PyTorch model to Unity project
Hit objects!
下午 02:21
2020/12/11

7. Test



Select this NN as your Car Agent model

7. Test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Car_Agent_s4
MobileRobot
Packages
Inspector
Car Agent
Static
Tag Untagged
Layer Default
Transform
Position X 0.89 Y 0 Z 0
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Behavior Parameters
Behavior Name MobileRobot
Vector Observation
Space Size 19
Stacked Vectors 1
Vector Action
Space Type Continuous
Space Size 2
Model MobileRobot (NN Model)
Inference Device CPU
Behavior Type Default
Team Id 0
Use Child Sensors
Observable Attribute Handlir Ignore
Decision Requester
Script DecisionRequester
Decision Period 1
Take Actions Between Decisic
Car_Agent_s 4 (Script)
Max Step 0
Script Car_Agent_s4
Dist Sensor
Robot Car
Goal goal
Add Component
Game
Display 1 Free Aspect Scale 1x Maximize On Play Mute Audio
Hit objects!
下午 02:25
2020/12/11