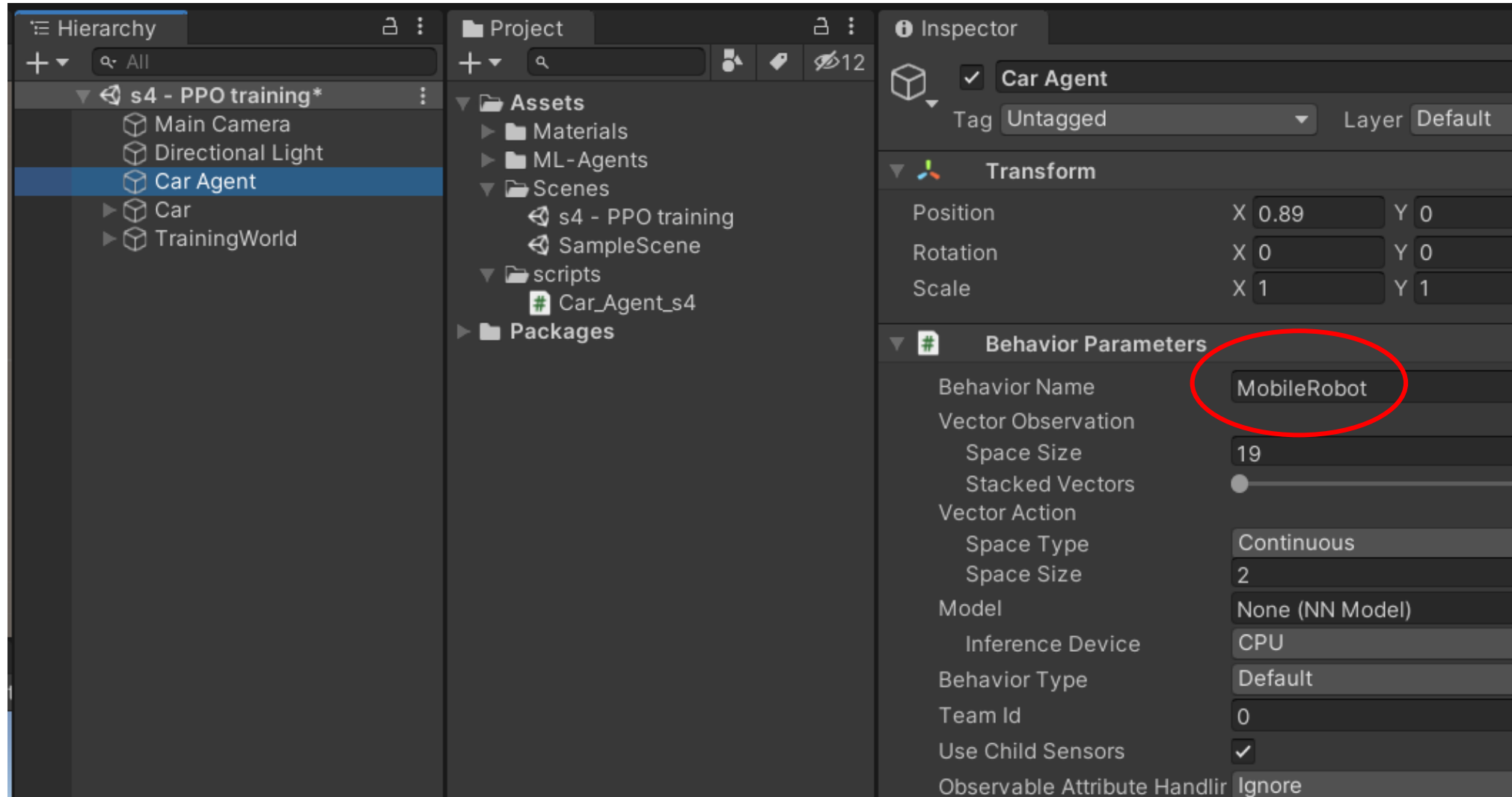


# 1. Change your behavior name



## 2. Create a configure file of the same name

> 本機 > 桌面 > ml-agents-release\_10 > config > ppo

名稱	修改日期	類型
3DBall	2020/11/20 上午 ...	YAML 檔案
3DBall_randomize	2020/11/20 上午 ...	YAML 檔案
3DBallHard	2020/11/20 上午 ...	YAML 檔案
Basic	2020/11/20 上午 ...	YAML 檔案
Bouncer	2020/11/20 上午 ...	YAML 檔案
CrawlerDynamic	2020/11/20 上午 ...	YAML 檔案
CrawlerDynamicVariableSpeed	2020/11/20 上午 ...	YAML 檔案
CrawlerStatic	2020/11/20 上午 ...	YAML 檔案
CrawlerStaticVariableSpeed	2020/11/20 上午 ...	YAML 檔案
FoodCollector	2020/11/20 上午 ...	YAML 檔案
GridFoodCollector	2020/11/20 上午 ...	YAML 檔案
GridWorld	2020/11/20 上午 ...	YAML 檔案
Hallway	2020/11/20 上午 ...	YAML 檔案
Match3	2020/11/20 上午 ...	YAML 檔案
MobileRobot	2020/11/20 上午 ...	YAML 檔案
PushBlock	2020/11/20 上午 ...	YAML 檔案
Pyramids	2020/11/20 上午 ...	YAML 檔案
PyramidsRND	2020/11/20 上午 ...	YAML 檔案
Reacher	2020/11/20 上午 ...	YAML 檔案
SoccerTwos	2020/11/20 上午 ...	YAML 檔案

```
behaviors:
  MobileRobot:
    trainer_type: ppo
    hyperparameters:
      batch_size: 64
      buffer_size: 12000
      learning_rate: 0.0003
      beta: 0.001
      epsilon: 0.2
      lambda: 0.99
      num_epoch: 3
      learning_rate_schedule: linear
    network_settings:
      normalize: true
      hidden_units: 128
      num_layers: 2
      vis_encode_type: simple
    reward_signals:
      extrinsic:
        time_horizon: 1000
        summary_freq: 12000
        threaded: true
```

You can download MobileRobot.yaml from my  
GitHub

### 3. Start train

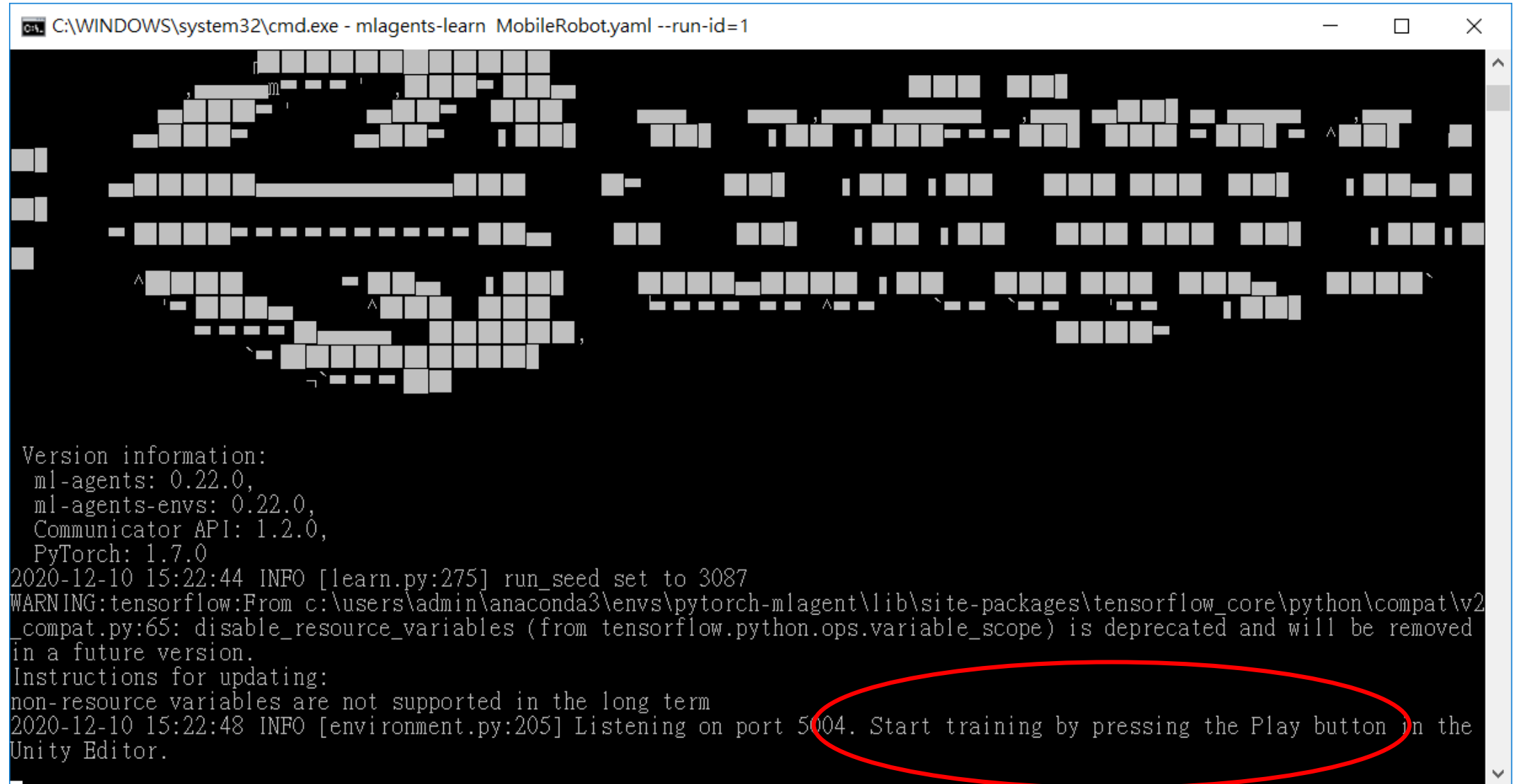
1. cd to the folder of your configuration file (C:\...\ml-agents-release\_10\config\ppo)
2. mlagents-learn MobilRobot.yaml --run-id=1 --force

C:\WINDOWS\system32\cmd.exe

```
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>  
(PyTorch-MLAgent) C:\>cd C:\Users\admin\Desktop\ml-agents-release_10\config\ppo  
(PyTorch-MLAgent) C:\Users\admin\Desktop\ml-agents-release_10\config\ppo>mlagents-learn MobileRobot.yaml -run-id=1
```

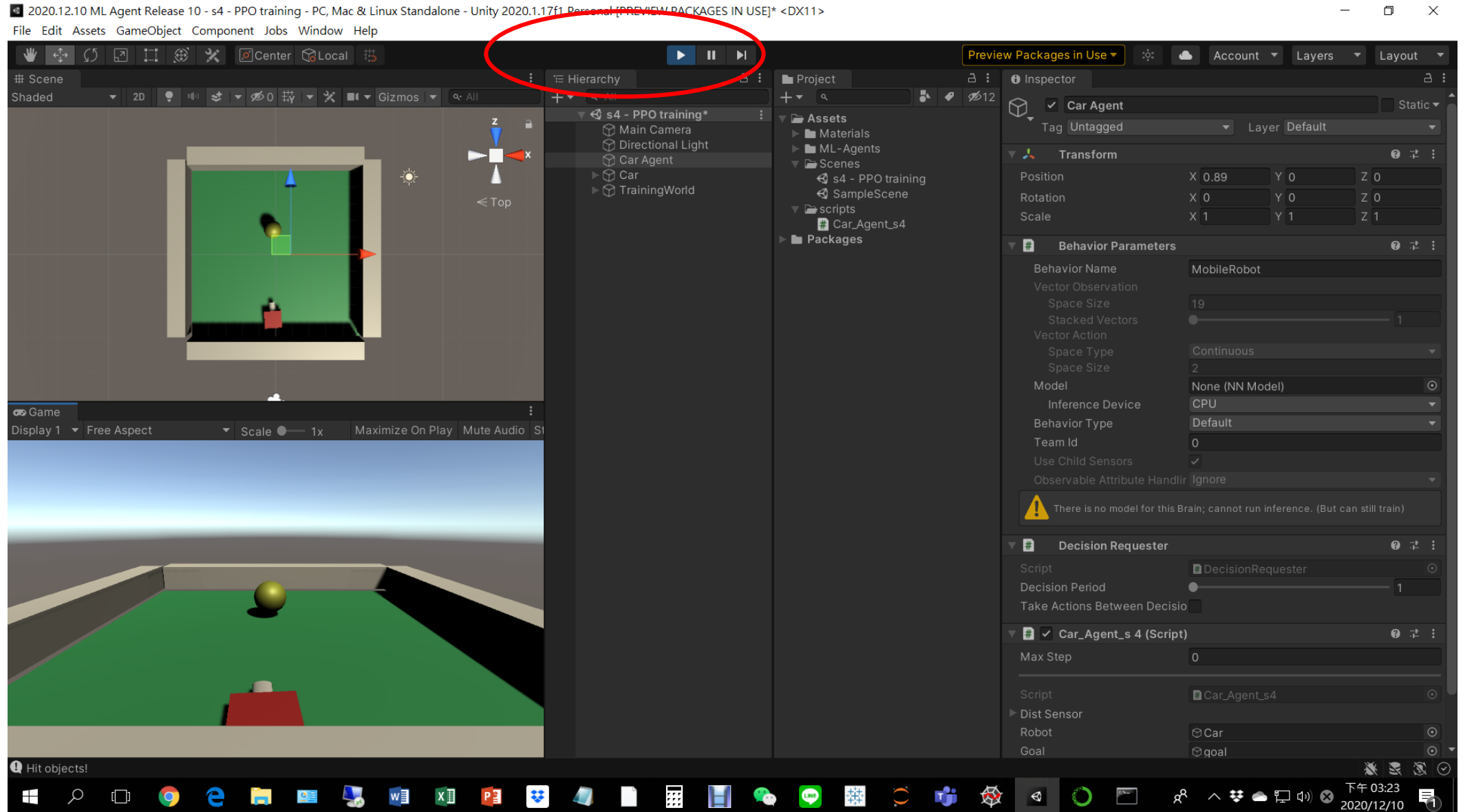
### 3. Start train

```
C:\WINDOWS\system32\cmd.exe - mlagents-learn MobileRobot.yaml --run-id=1
```



```
Version information:  
ml-agents: 0.22.0,  
ml-agents-envs: 0.22.0,  
Communicator API: 1.2.0,  
PyTorch: 1.7.0  
2020-12-10 15:22:44 INFO [learn.py:275] run_seed set to 3087  
WARNING:tensorflow:From c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\tensorflow_core\python\compat\v2_compat.py:65: disable_resource_variables (from tensorflow.python.ops.variable_scope) is deprecated and will be removed in a future version.  
Instructions for updating:  
non-resource variables are not supported in the long term  
2020-12-10 15:22:48 INFO [environment.py:205] Listening on port 5004. Start training by pressing the Play button in the Unity Editor.
```

### 3. Start train



(You might need to download MS VC redistributable)

```
C:\WINDOWS\system32\cmd.exe

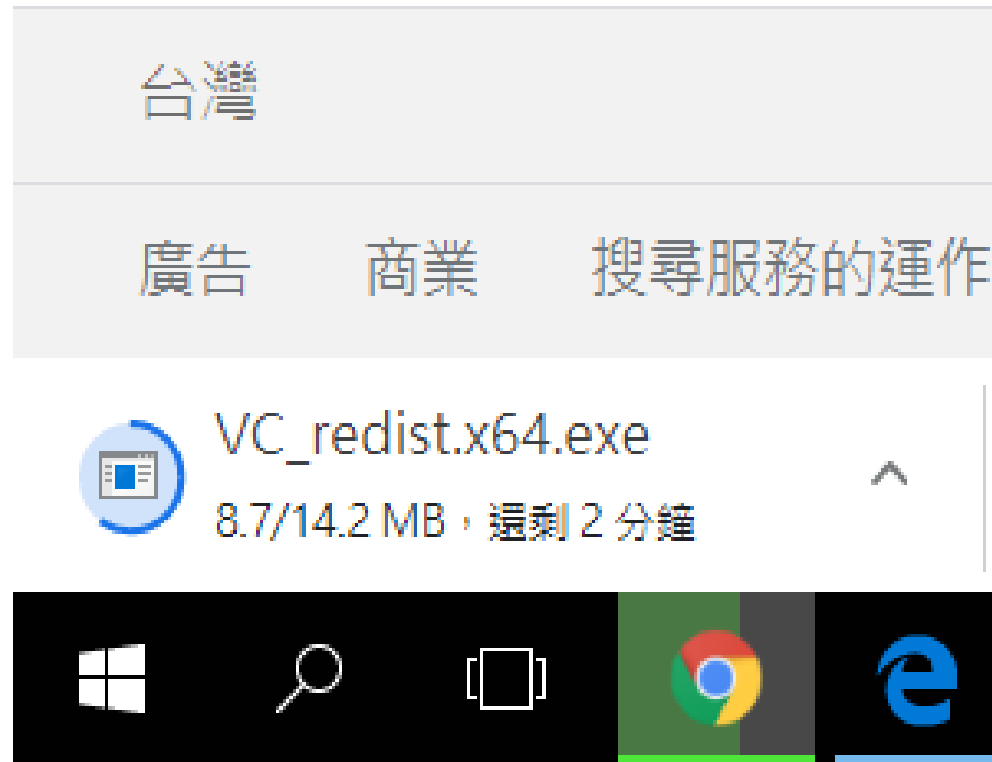
(PyTorch-MLagent) C:\Users\admin>cd C:\Users\admin\Desktop\ml-agents-release_10\config\ppo
(PyTorch-MLagent) C:\Users\admin\Desktop\ml-agents-release_10\config\ppo>mlagents-learn MobileRobot.yaml -run-id=1
Microsoft Visual C++ Redistributable is not installed, this may lead to the DLL load failure.
It can be downloaded at https://aka.ms/vs/16/release/vc_redist.x64.exe
Traceback (most recent call last):
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\runpy.py", line 193, in _run_module_as_main
    "__main__", mod_spec)
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\runpy.py", line 85, in _run_code
    exec(code, run_globals)
  File "C:\Users\admin\Anaconda3\envs\PyTorch-MLagent\Scripts\mlagents-learn.exe\__main__.py", line 4, in <module>
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\mlagents\trainers\learn.py", line 2, in <module>

    from mlagents import torch_utils
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\mlagents\torch_utils\__init__.py", line 1, in <module>
    from mlagents.torch_utils.torch import torch # noga
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\mlagents\torch_utils\torch.py", line 29, in <module>
    import torch # noga 1201
  File "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\torch\__init__.py", line 128, in <module>
    raise err
OSError: [WinError 126] 找不到指定的模組。 Error loading "c:\users\admin\anaconda3\envs\pytorch-mlagent\lib\site-packages\torch\lib\asmjit.dll" or one of its dependencies.

(PyTorch-MLagent) C:\Users\admin\Desktop\ml-agents-release_10\config\ppo>
```

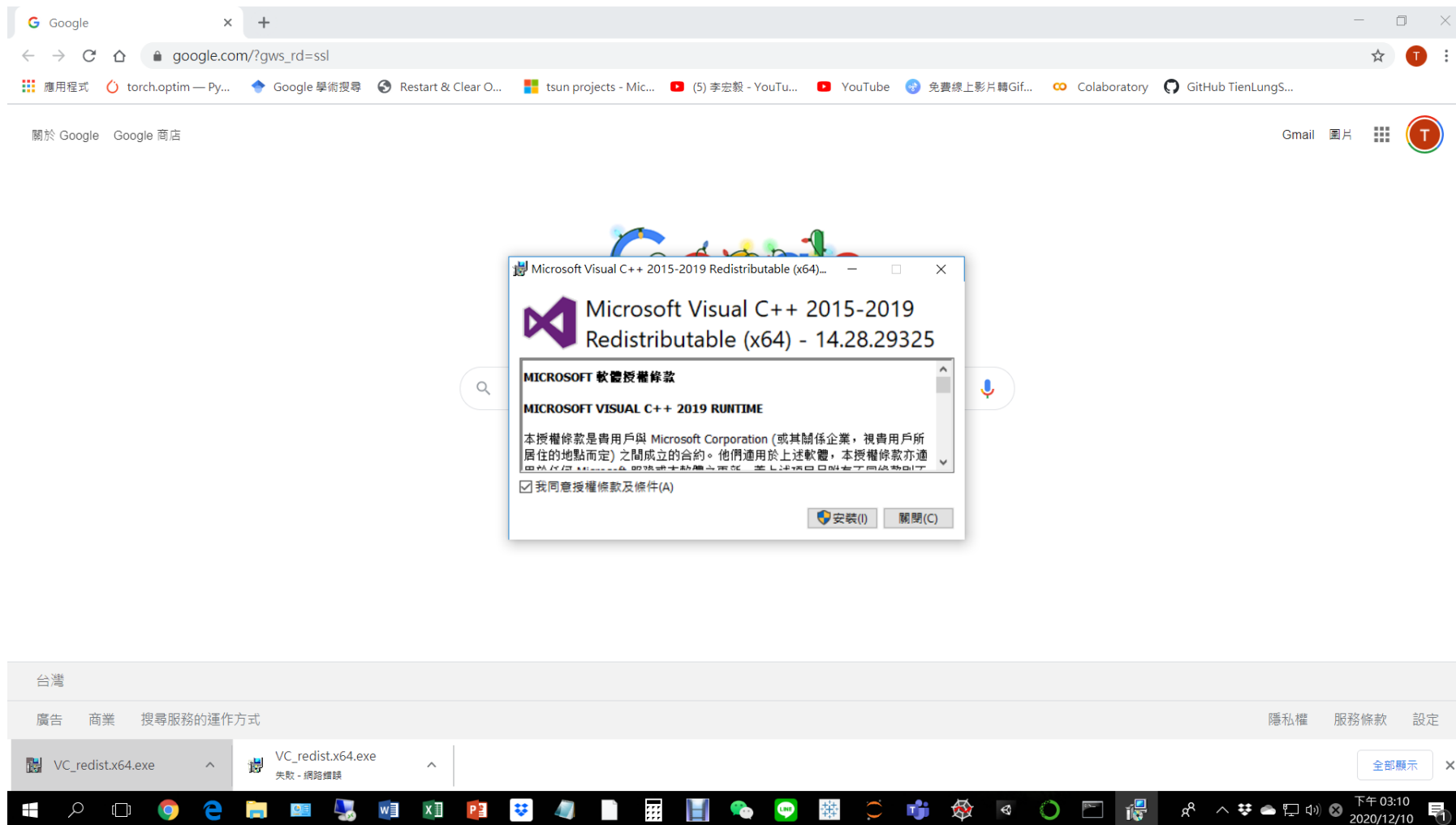
[https://aka.ms/vs/16/release/vc\\_redist.x64.exe](https://aka.ms/vs/16/release/vc_redist.x64.exe)

(You might need to download MS VC redistributable)



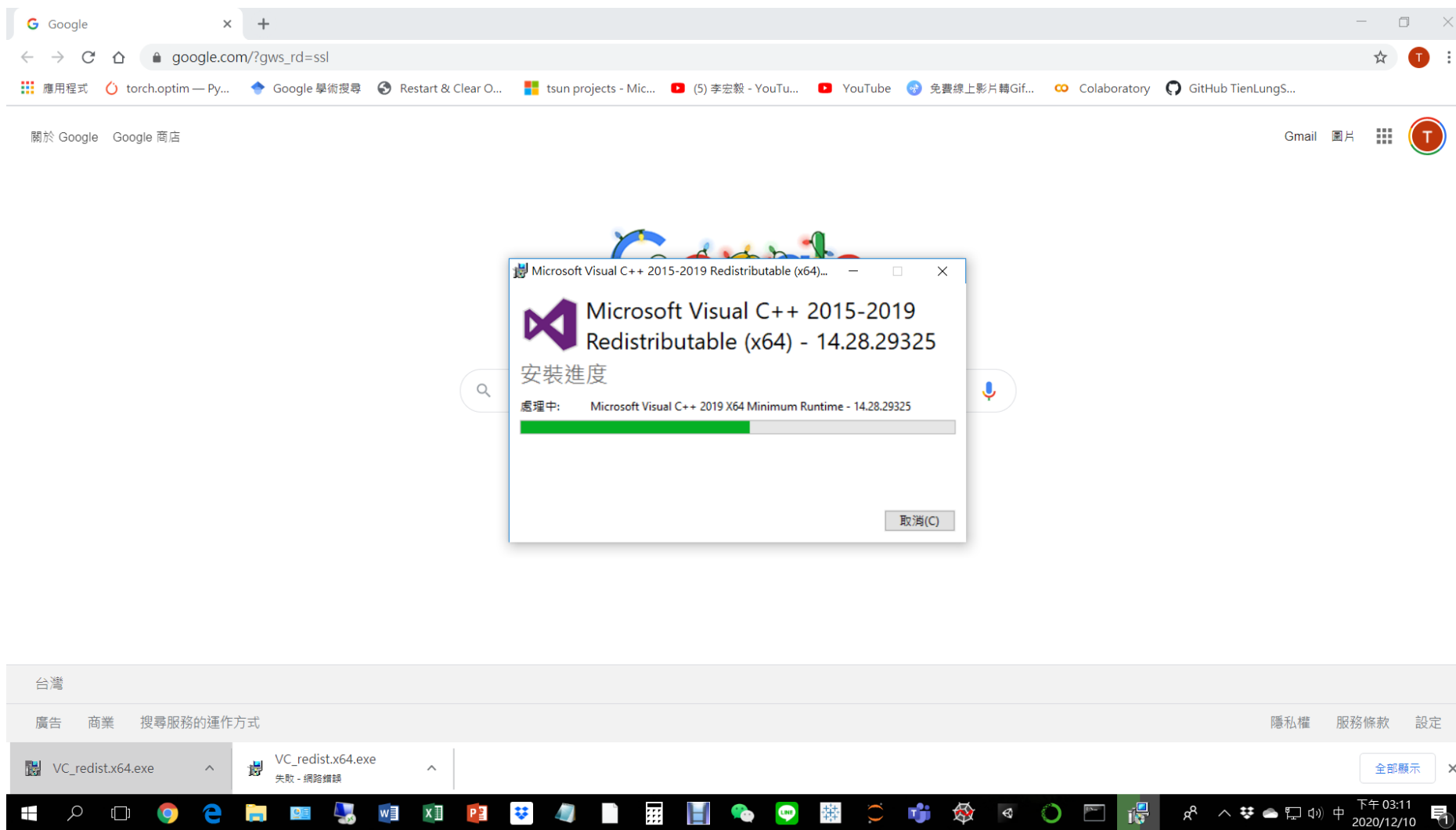
[https://aka.ms/vs/16/release/vc\\_redist.x64.exe](https://aka.ms/vs/16/release/vc_redist.x64.exe)

(You might need to download MS VC redistributable)





(You might need to download MS VC redistributable)



## 4. Training

```
C:\Windows\system32\cmd.exe - mlagents-learn MobileRobot.yaml --run-id=2

beta: 0.005
epsilon: 0.2
lambda: 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 Re
ward: 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

Anaconda Navigator

File Help

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Create Clone Import Remove

233 packages available

base (root)

PyTorch-MLAgent

Open Terminal

Open with Python

Open with IPython

Open with Jupyter Notebook

Name Description Version

Abseil python common libraries, see https://github.com/abseil/abseil-py.	0.9.0
Configurable, python 2+3 compatible sphinx theme.	0.7.12
Read, rewrite, and write python asts nicely	0.8.1
A abstract syntax tree for python with inference support.	2.4.2
Attrs is the python package that will bring back the joy of writing classes by relieving you from the drudgery of implementing object protocols (aka dunder methods).	19.3.0
Utilities to internationalize and localize python applications	2.8.0
Specifications for callback functions passed in to an api	0.1.0
	1.0
	3.1.0
Amazon web services sdk for python	1.14.33
Low-level, data-driven core of boto 3.	1.17.33
	0.7.0
Certificates for use with other packages.	2020.12.8
	4.0.0
	1.0.0
Python package for providing mozilla's ca bundle.	2020.12.5
Foreign function interface for python calling c code.	1.14.0
Universal character encoding detector	3.0.4
Python composable command line interface toolkit	7.1.2

Open another terminal window

下午 02:04  
2020/12/11

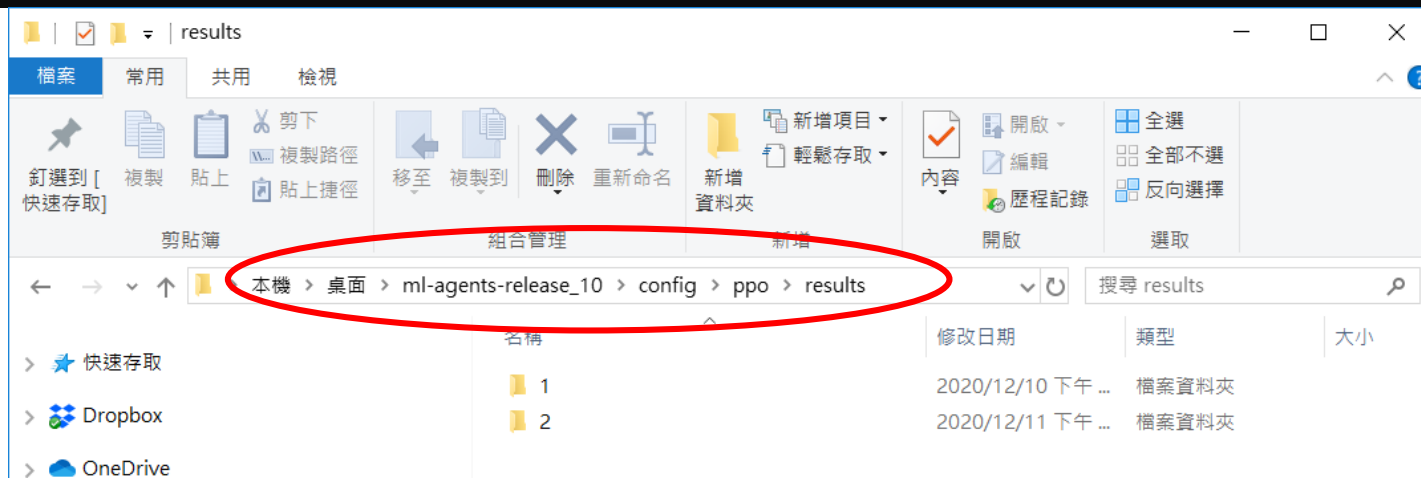
## 5. Monitor training performance

1. cd to the results folder (... ml-agents-release-10\config\ppo\results)
2. tensorboard --logdir=1

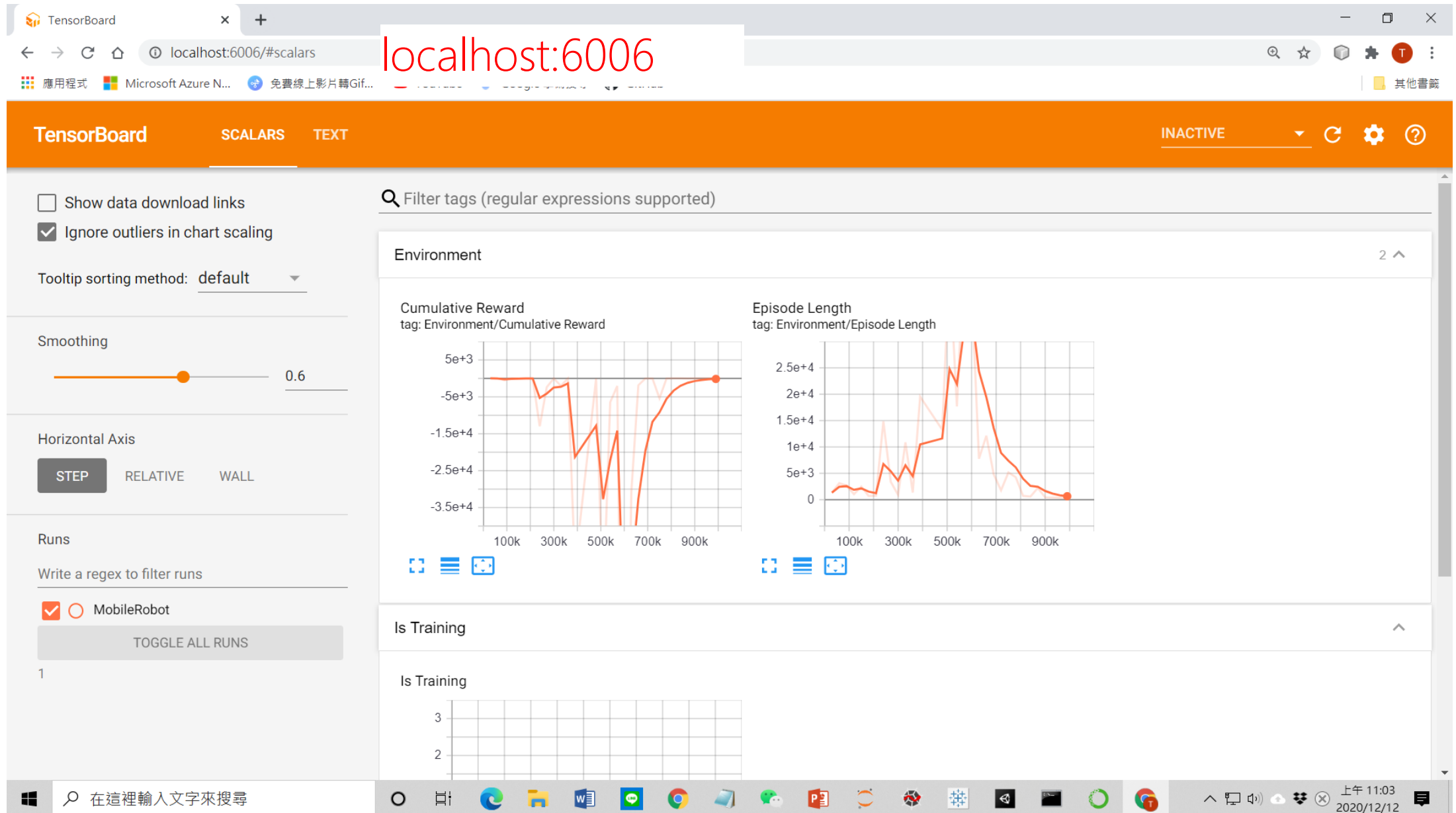
```
C:\Windows\system32\cmd.exe - tensorboard --logdir=1

(base) C:\Users\ADMIN>cd C:\ml-agents-release_10\config\ppo\results

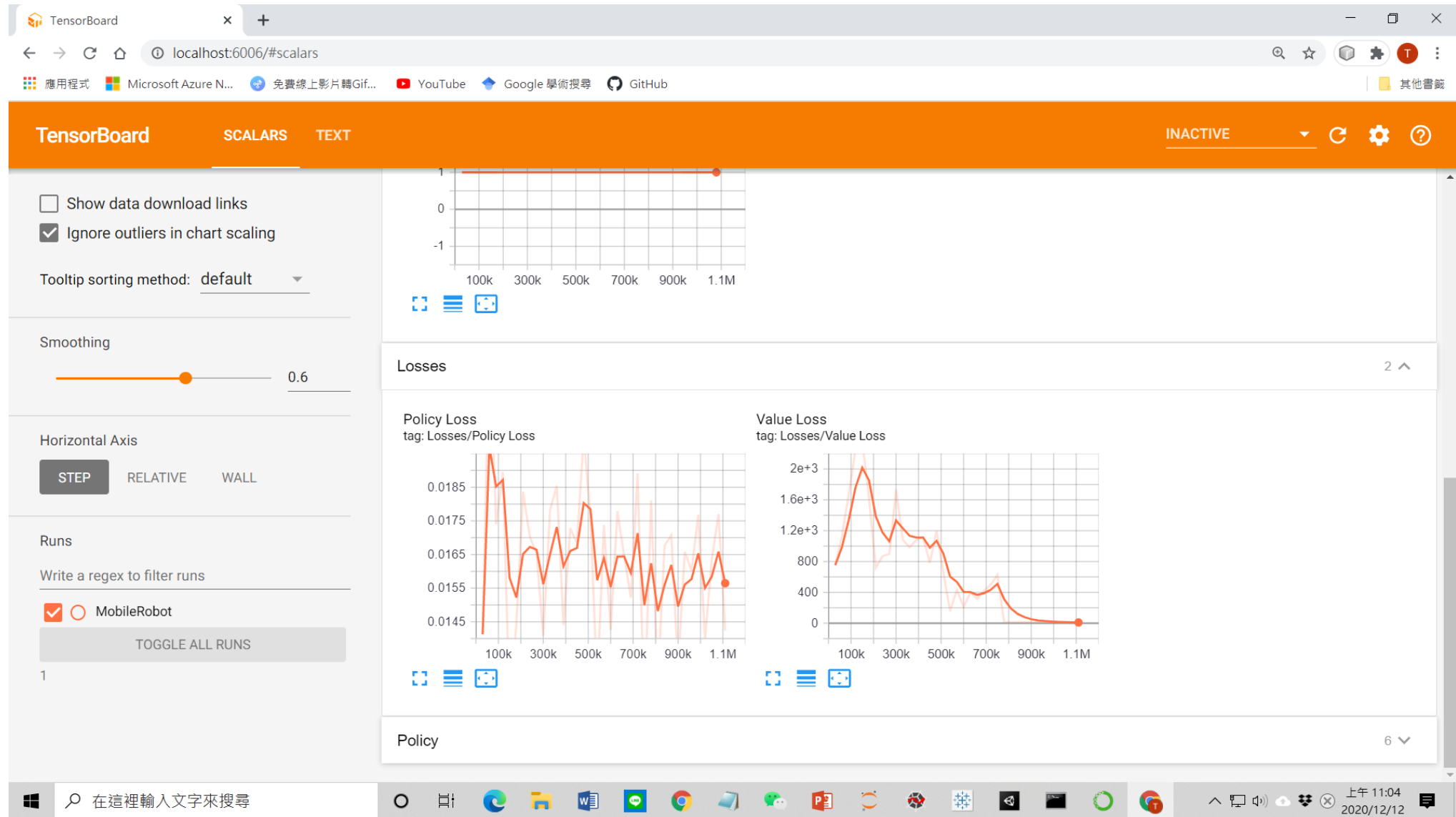
(base) C:\ml-agents-release_10\config\ppo\results>tensorboard --logdir=1
2020-12-12 11:01:50.969019: W tensorflow/stream_executor/platform/default/dso_loader.cc:55] Could not load dynamic library 'cudart64_101.dll'; dlderror: cudart64_101.dll not found
2020-12-12 11:01:50.969170: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.
Serving TensorBoard on localhost; to expose to the network, use a proxy or pass --bind_all
TensorBoard 2.2.2 at http://localhost:6006/ (Press CTRL+C to quit)
```



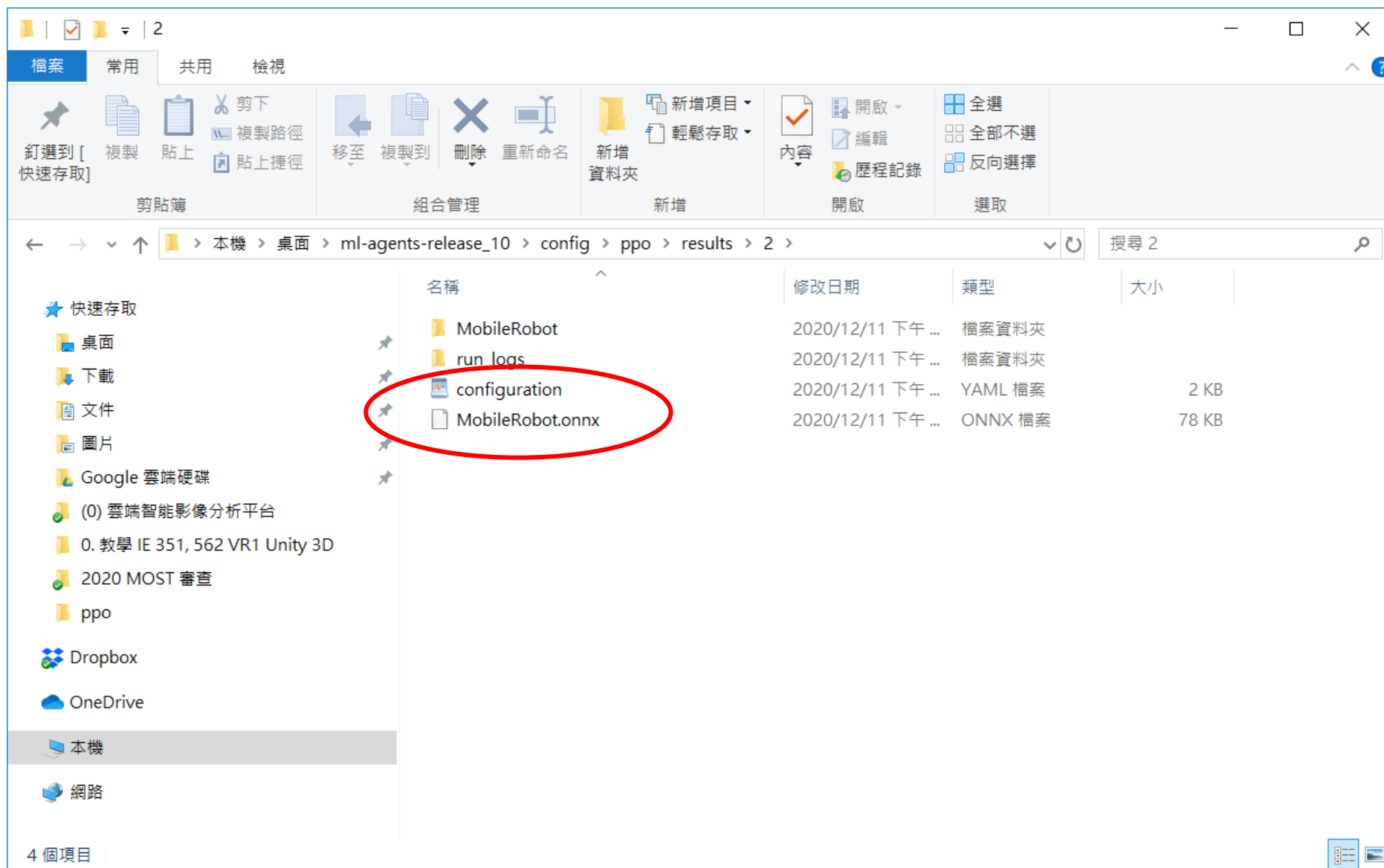
# 5. Monitor training performance



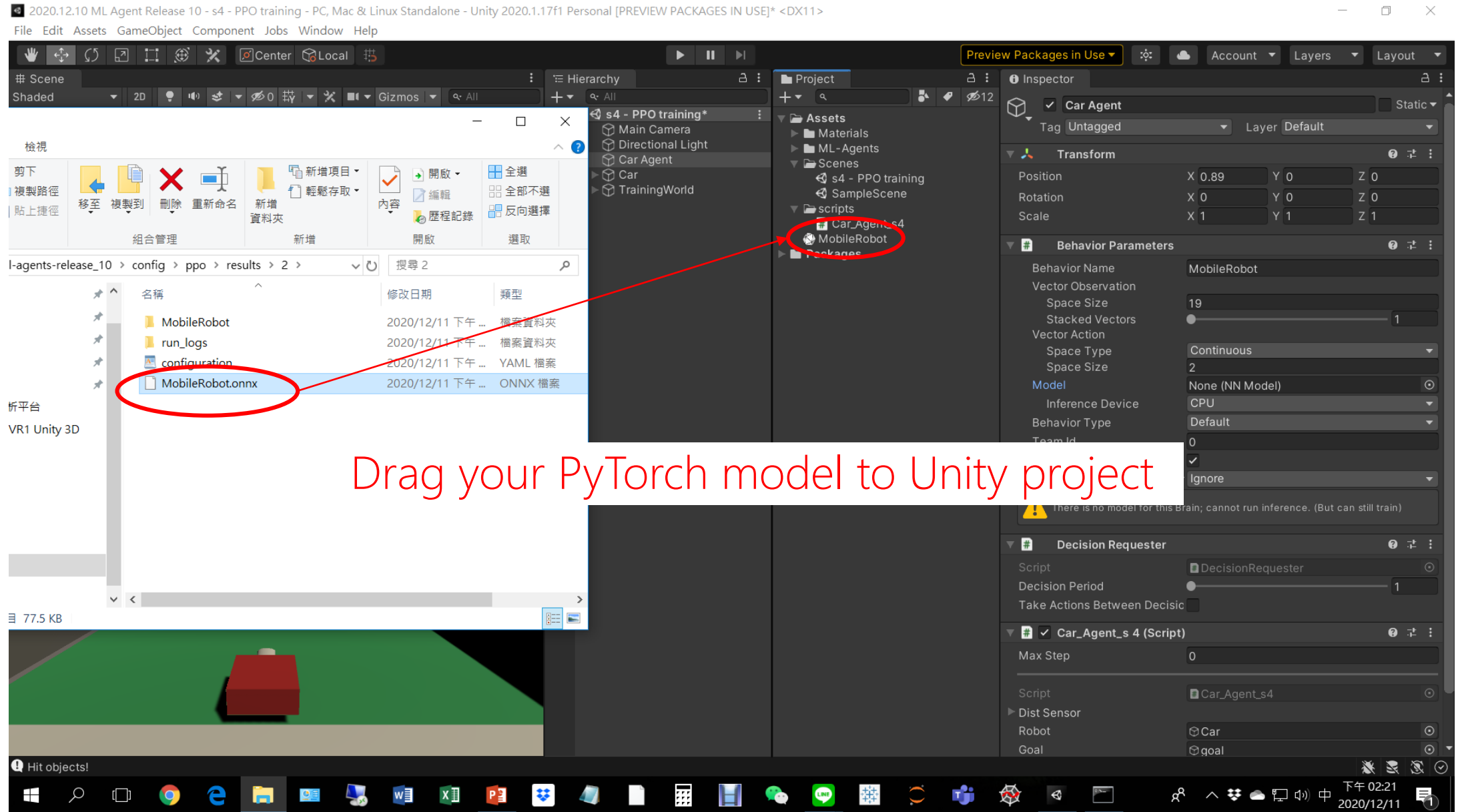
# 5. Monitor training performance



## 6. Finish training

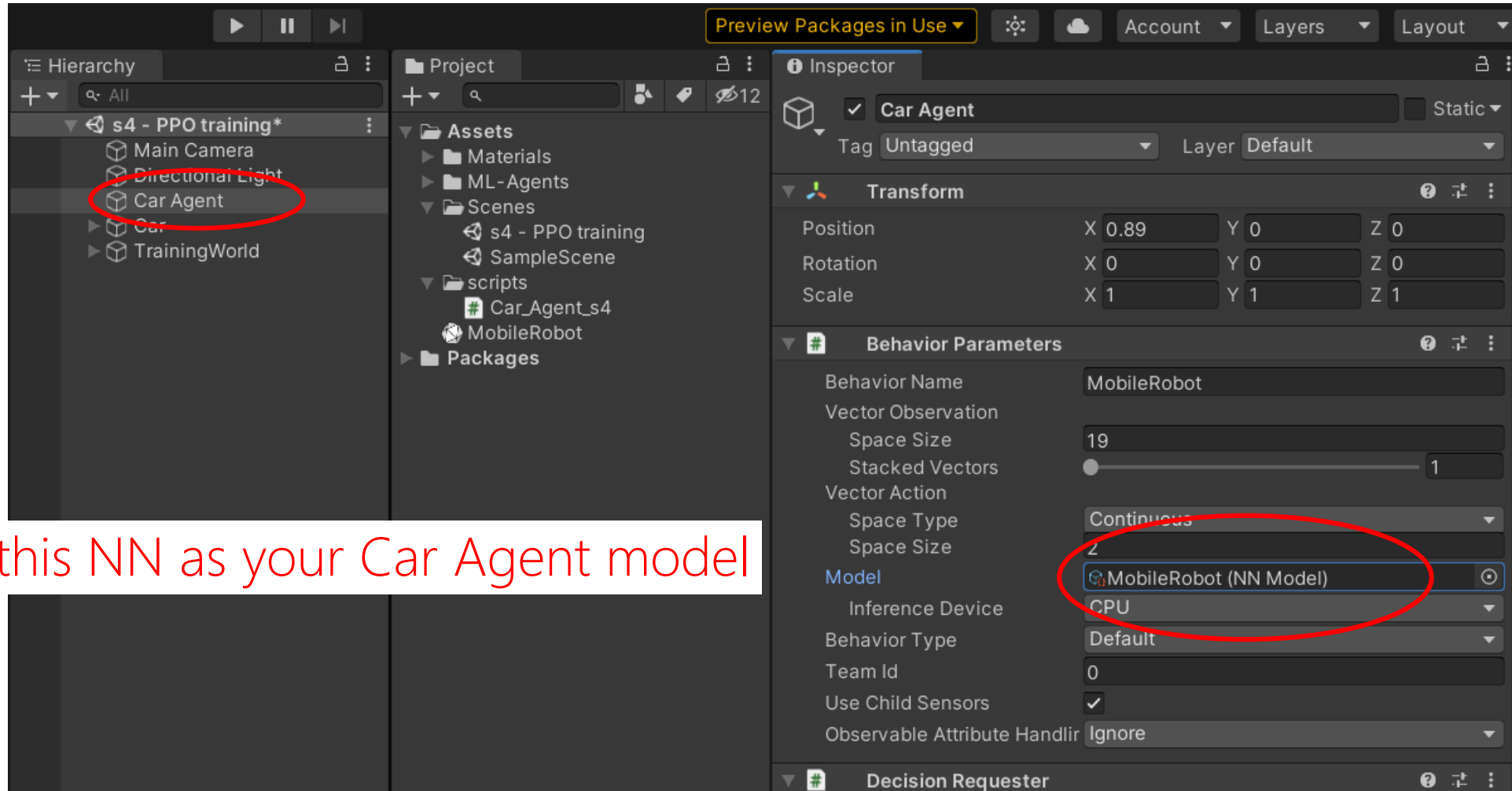


# 7. Test





## 7. Test



# 7. Test

