How to use Pytorch on GPU?

Reference:
https://medium.com/udacity-pytorch-challengers/pytorch-on-google-cloud-platform-gcp-66644bfc07eb

1. **Install development toolchain and setup VM (copy and paste the following command without comments)**

```
sudo apt update && sudo apt upgrade
sudo apt install dkms build-essential linux-headers-$(uname -r)

sudo mkdir -p /var/cache/swap/ # create a directory that holds the swap file
sudo dd if=/dev/zero of=/var/cache/swap/myswap bs=1M count=4096 # for 4 GByte
sudo chmod 0600 /var/cache/swap/myswap # only root should have access
sudo mkswap /var/cache/swap/myswap # format as swap
sudo swapon /var/cache/swap/myswap # announce to system
```

Add the following line to /etc/fstab so that the swap will get loaded upon system startup

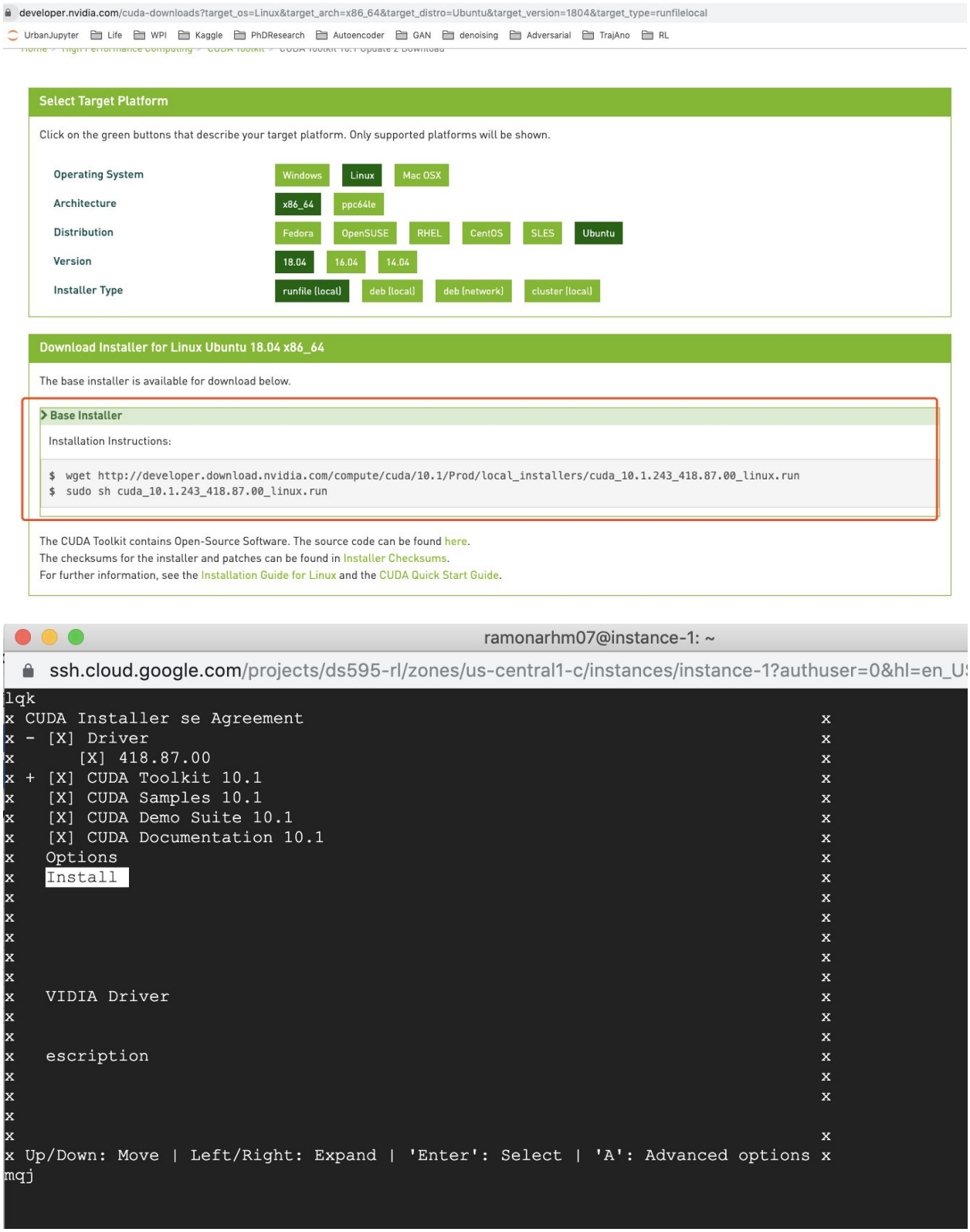
```
cd etc/
sudo vi fstab # edit the file with root
"/var/cache/swap/myswap    none    swap    sw    0    0"
```

(copy paste the above line without quotation marks)

```
:wq # write and quit
```

2. **Download and install cuda_10.1**

```
wget http://developer.download.nvidia.com/compute/cuda/10.1/Prod/local_installers/cuda_10.1.243_418.87.00_linux.run

sudo sh cuda_10.1.243_418.87.00_linux.run
```


developer.nvidia.com/cuda-downloads?target_os=Linux&target_arch=x86_64&target_distro=Ubuntu&target_version=1804&target_type=runfilelocal
UrbanJupyter
Life
WPI
Kaggle
PhDResearch
Autoencoder
GAN
denoising
Adversarial
TrajAno
RL
Select Target Platform
Click on the green buttons that describe your target platform. Only supported platforms will be shown.
Operating System
Windows
Linux
Mac OSX
Architecture
x86_64
ppc64le
Distribution
Fedora
OpenSUSE
RHEL
CentOS
SLES
Ubuntu
Version
18.04
16.04
14.04
Installer Type
runfile (local)
deb (local)
deb (network)
cluster (local)
Download Installer for Linux Ubuntu 18.04 x86_64
The base installer is available for download below.
Base Installer
Installation Instructions:
$ wget http://developer.download.nvidia.com/compute/cuda/10.1/Prod/local_installers/cuda_10.1.243_418.87.00_linux.run
$ sudo sh cuda_10.1.243_418.87.00_linux.run
The CUDA Toolkit contains Open-Source Software. The source code can be found here.
The checksums for the installer and patches can be found in Installer Checksums.
For further information, see the Installation Guide for Linux and the CUDA Quick Start Guide.
ramonarhm07@instance-1: ~
ssh.cloud.google.com/projects/ds595-rl/zones/us-central1-c/instances/instance-1?authuser=0&hl=en_US
lqk
x CUDA Installer se Agreement x
x - [X] Driver x
x [X] 418.87.00 x
x + [X] CUDA Toolkit 10.1 x
x [X] CUDA Samples 10.1 x
x [X] CUDA Demo Suite 10.1 x
x [X] CUDA Documentation 10.1 x
x Options x
x Install x
x x
x x
x x
x x
x x
x VIDIA Driver x
x x
x x
x escription x
x x
x x
x x
x x
x Up/Down: Move | Left/Right: Expand | 'Enter': Select | 'A': Advanced options x
mqj

```
ramonarhm07@instance-1:~$ wget http://developer.download.nvidia.com/compute/cuda/10.1/Prod/local_installers/cuda_10
.1.243_418.87.00_linux.run
--2019-08-21 17:52:17--  http://developer.download.nvidia.com/compute/cuda/10.1/Prod/local_installers/cuda_10.1.243
_418.87.00_linux.run
Resolving developer.download.nvidia.com (developer.download.nvidia.com)... 192.229.211.70, 2606:2800:21f:3aa:dcf:37
b:1ed6:1fb
Connecting to developer.download.nvidia.com (developer.download.nvidia.com)|192.229.211.70|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2572375299 (2.4G) [application/octet-stream]
Saving to: 'cuda_10.1.243_418.87.00_linux.run'

cuda_10.1.243_418.87.00_linu 100%[=========================================>]   2.40G   121MB/s    in 12s

2019-08-21 17:52:29 (197 MB/s) - 'cuda_10.1.243_418.87.00_linux.run' saved [2572375299/2572375299]

ramonarhm07@instance-1:~$ ls
cuda_10.1.243_418.87.00_linux.run
ramonarhm07@instance-1:~$ sudo sh cuda_10.1.243_418.87.00_linux.run
===========
= Summary =
===========

Driver:   Installed
Toolkit:  Installed in /usr/local/cuda-10.1/
Samples:  Installed in /home/ramonarhm07/, but missing recommended libraries

Please make sure that
 -   PATH includes /usr/local/cuda-10.1/bin
 -   LD_LIBRARY_PATH includes /usr/local/cuda-10.1/lib64, or, add /usr/local/cuda-10.1/lib64 to /etc/ld.so.conf and
 run ldconfig as root

To uninstall the CUDA Toolkit, run cuda-uninstaller in /usr/local/cuda-10.1/bin
To uninstall the NVIDIA Driver, run nvidia-uninstall

Please see CUDA_Installation_Guide_Linux.pdf in /usr/local/cuda-10.1/doc/pdf for detailed information on setting up
 CUDA.
Logfile is /var/log/cuda-installer.log
ramonarhm07@instance-1:~$
```

Test Nvidia

```
cd  ~/NVIDIA_CUDA-10.1_Samples/0_Simple/vectorAdd
make
.vectorAdd
```

```
ramonarhm07@instance-1:~/NVIDIA_CUDA-10.1_Samples/0_Simple/vectorAdd$ make
/usr/local/cuda/bin/nvcc -ccbin g++ -I../../common/inc  -m64    -gencode arch=compute_30,code=sm_30 -gencode arch=c
ompute_35,code=sm_35 -gencode arch=compute_37,code=sm_37 -gencode arch=compute_50,code=sm_50 -gencode arch=compute_
52,code=sm_52 -gencode arch=compute_60,code=sm_60 -gencode arch=compute_61,code=sm_61 -gencode arch=compute_70,code
=sm_70 -gencode arch=compute_75,code=sm_75 -gencode arch=compute_75,code=compute_75 -o vectorAdd.o -c vectorAdd.cu
/usr/local/cuda/bin/nvcc -ccbin g++   -m64      -gencode arch=compute_30,code=sm_30 -gencode arch=compute_35,code=s
m_35 -gencode arch=compute_37,code=sm_37 -gencode arch=compute_50,code=sm_50 -gencode arch=compute_52,code=sm_52 -g
encode arch=compute_60,code=sm_60 -gencode arch=compute_61,code=sm_61 -gencode arch=compute_70,code=sm_70 -gencode
arch=compute_75,code=sm_75 -gencode arch=compute_75,code=compute_75 -o vectorAdd vectorAdd.o
mkdir -p ../../bin/x86_64/linux/release
cp vectorAdd ../../bin/x86_64/linux/release
ramonarhm07@instance-1:~/NVIDIA_CUDA-10.1_Samples/0_Simple/vectorAdd$ ./vectorAdd
[Vector addition of 50000 elements]
Copy input data from the host memory to the CUDA device
CUDA kernel launch with 196 blocks of 256 threads
Copy output data from the CUDA device to the host memory
Test PASSED
Done
```

3. Download and install anaconda

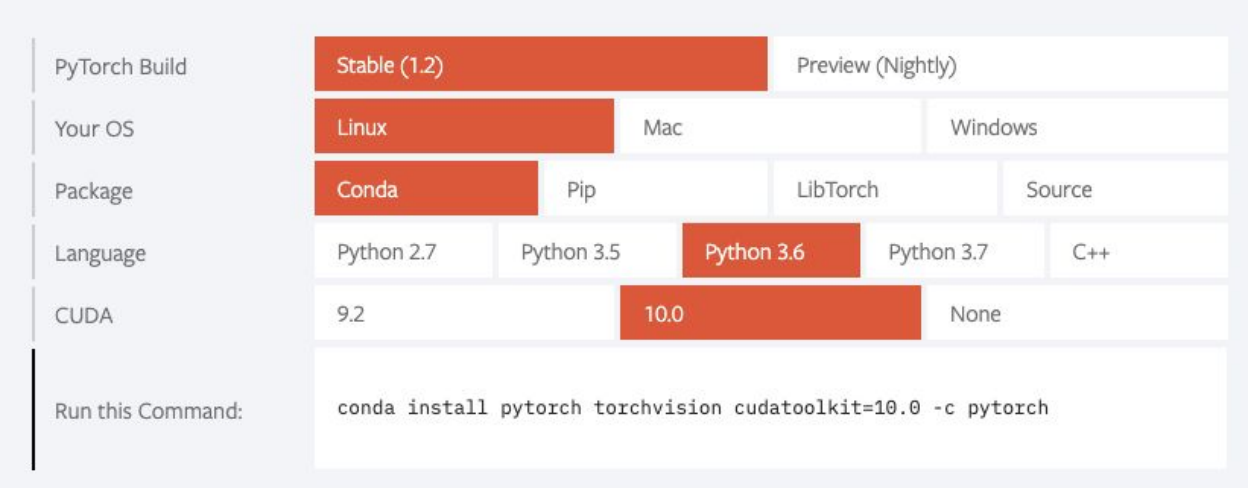
```
wget
https://repo.continuum.io/archive/Anaconda3-2019.07-Linux-x
86_64.sh
bash Anaconda3-2019.07-Linux-x86_64.sh
```

```
ramonarhm07@instance-1:~$ wget https://repo.continuum.io/archive/Anaconda3-2019.07-Linux-x86_64.sh
--2019-08-21 18:05:54--  https://repo.continuum.io/archive/Anaconda3-2019.07-Linux-x86_64.sh
Resolving repo.continuum.io (repo.continuum.io)... 104.18.201.79, 104.18.200.79, 2606:4700::6812:c84f, ...
Connecting to repo.continuum.io (repo.continuum.io)|104.18.201.79|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 541906131 (517M) [application/x-sh]
Saving to: 'Anaconda3-2019.07-Linux-x86_64.sh'

Anaconda3-2019.07-Linux-x86_ 100%[=========================================>] 516.80M   104MB/s    in 5.4s

2019-08-21 18:05:59 (96.3 MB/s) - 'Anaconda3-2019.07-Linux-x86_64.sh' saved [541906131/541906131]

ramonarhm07@instance-1:~$ bash Anaconda3-2019.07-Linux-x86_64.sh

Welcome to Anaconda3 2019.07

In order to continue the installation process, please review the license
agreement.
Please, press ENTER to continue
>>>
```

```
source ~/.bashrc
```

```
ramonarhm07@instance-1:~$ source ~/.bashrc
(base) ramonarhm07@instance-1:~$
```

4. **Install pytorch-gpu**




```
conda install pytorch torchvision cudatoolkit=10.0 -c pytorch
```

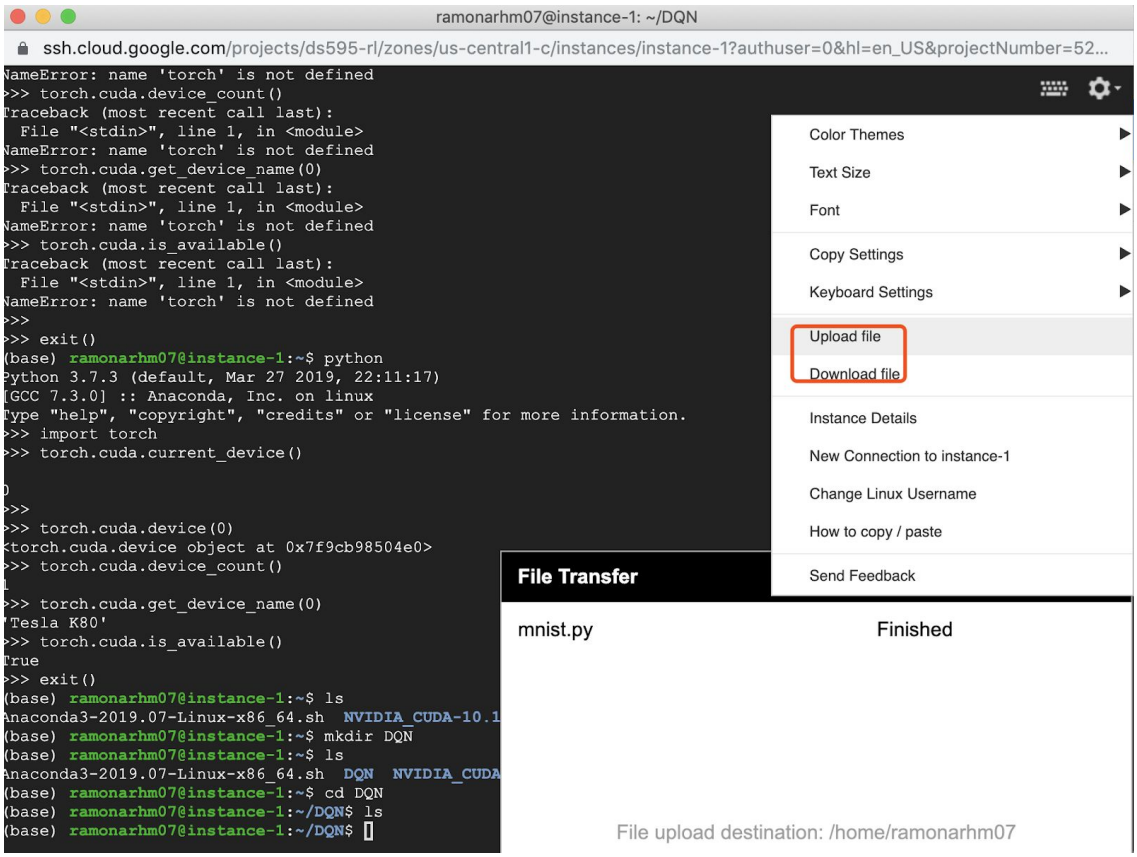
5. **Install pytorch-gpu**

```
python
Import torch
torch.cuda.current_device()
torch.cuda.device(0)
torch.cuda.device_count()
```

```
torch.cuda.get_device_name(0)
torch.cuda.is_available()
```

```
(base) ramonarhm07@instance-1:~$ python
Python 3.7.3 (default, Mar 27 2019, 22:11:17)
[GCC 7.3.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import torch
>>> torch.cuda.current_device()

0
>>>
>>> torch.cuda.device(0)
<torch.cuda.device object at 0x7f9cb98504e0>
>>> torch.cuda.device_count()
1
>>> torch.cuda.get_device_name(0)
'Tesla K80'
>>> torch.cuda.is_available()
True
>>>
```

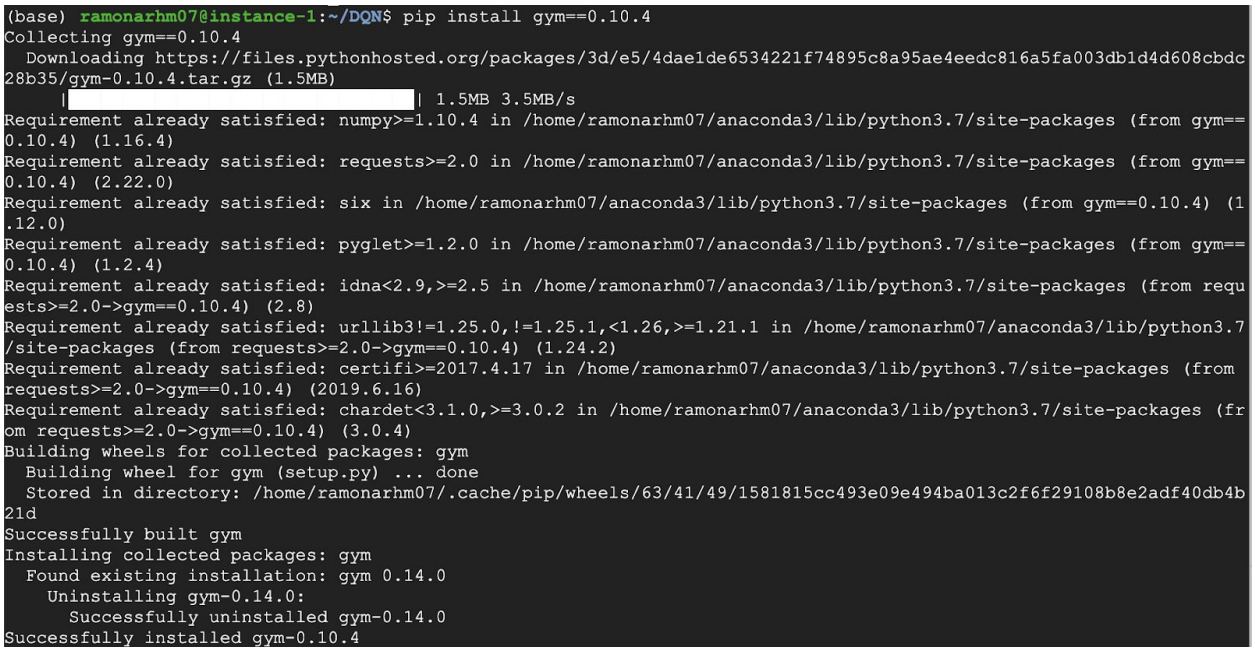
6. **Upload and download file to GCP**
   https://cloud.google.com/compute/docs/instances/transfer-files



Install Packages

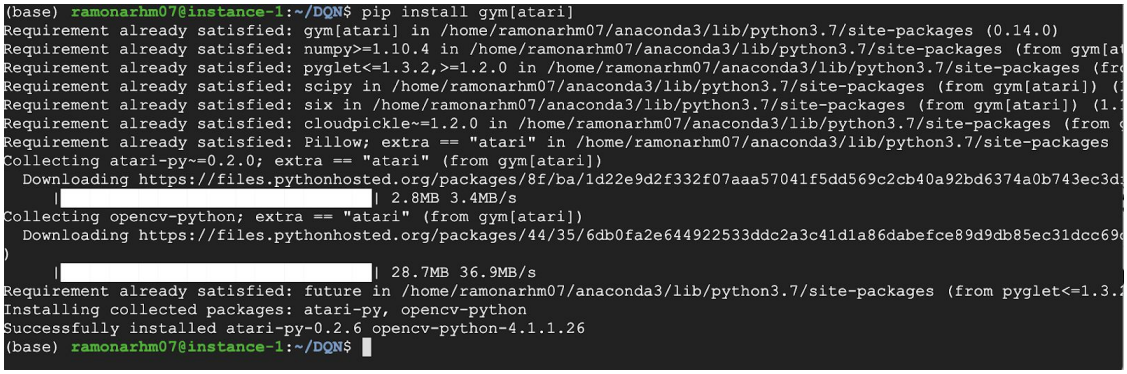
1. Install gym

   `pip install gym==0.10.4`



2. Install gym[atari]

   `pip install gym[atari]`



3. Install opencv-python

   `pip install opencv-python-headless`