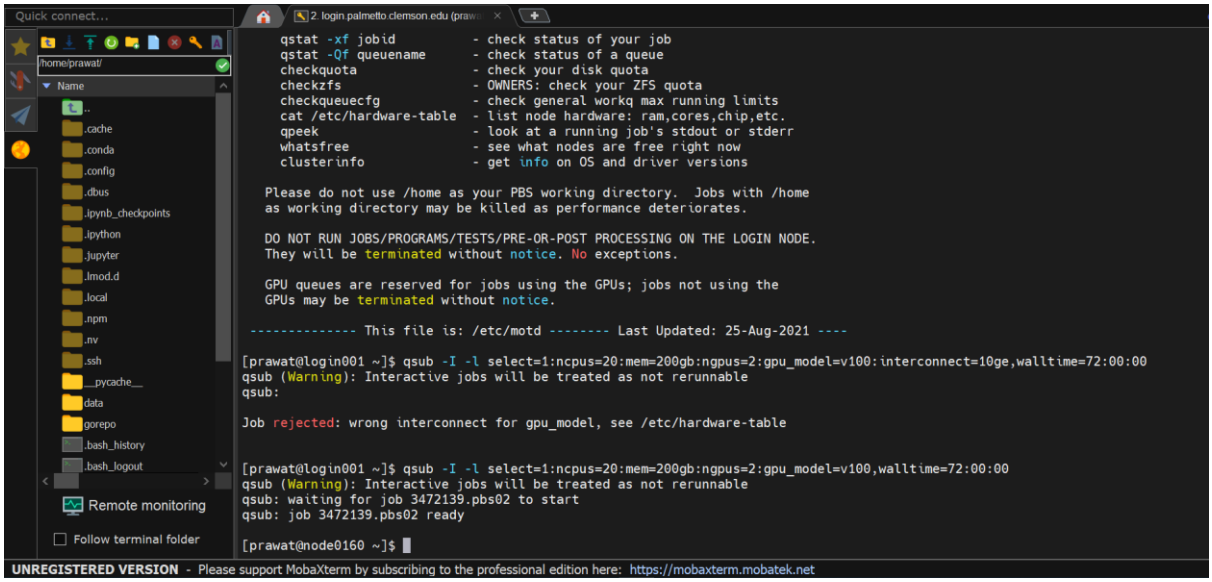
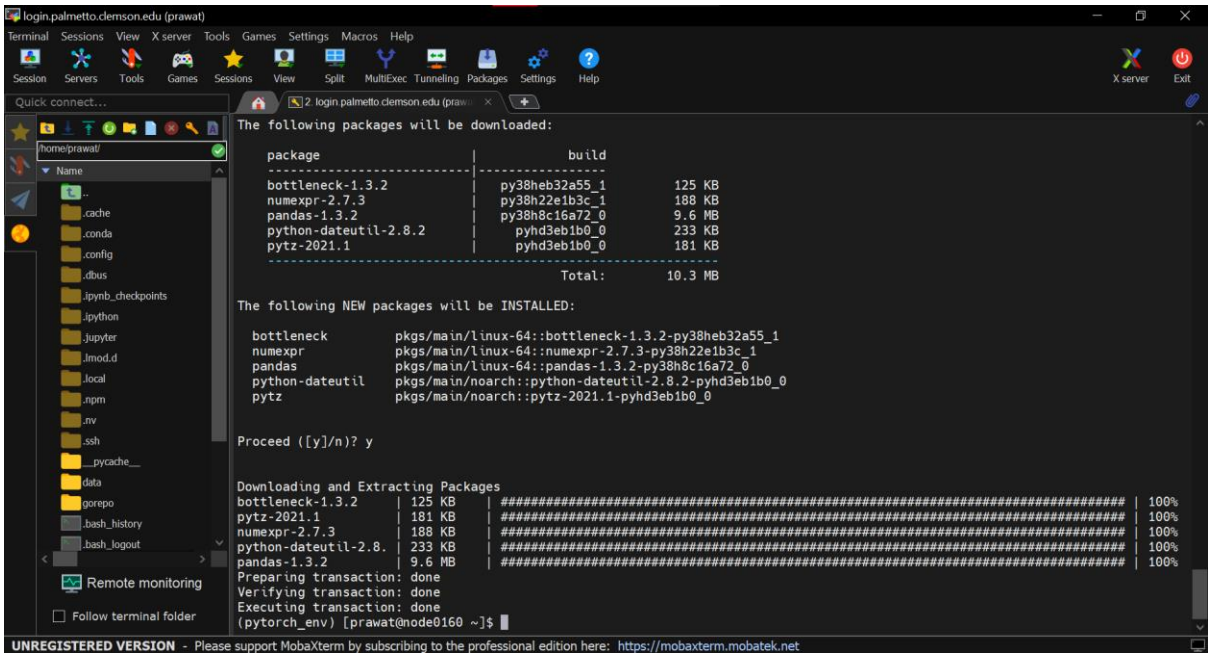
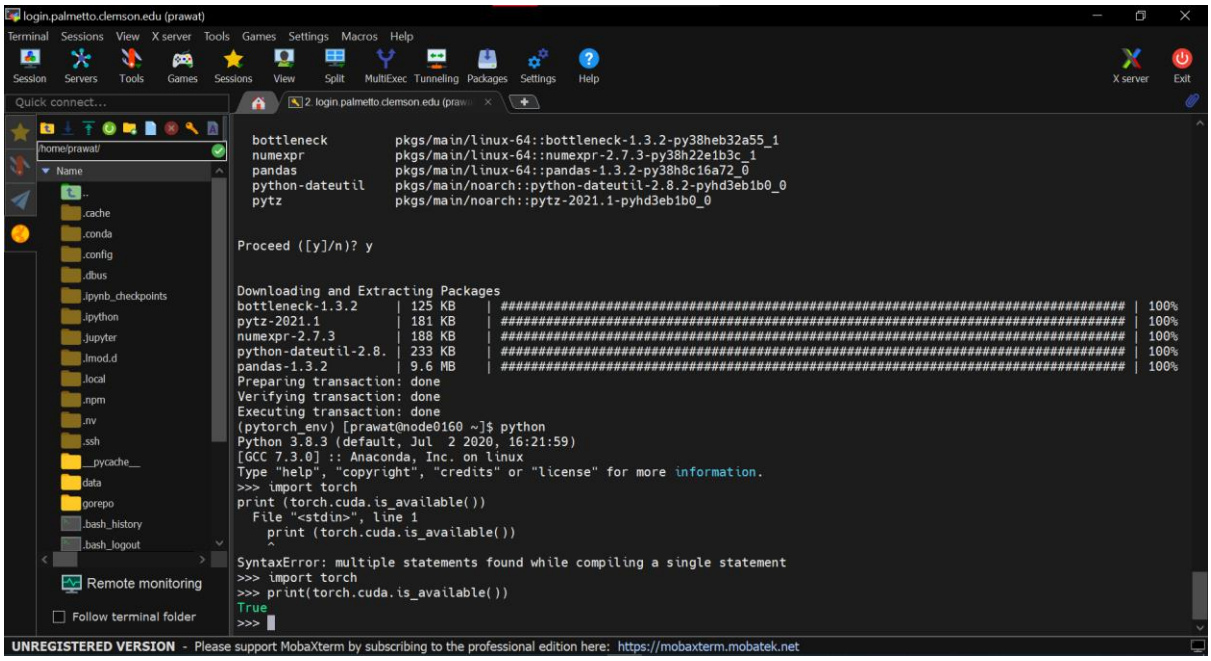
Homework 1

Question 1- Answers:

(1) Show screenshots of successful installation and procedure of the setup. (15 points)






login.palmetto.clemson.edu (prawat)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
2. login.palmetto.clemson.edu (prawa
/home/prawat/
Name
.cache
.conda
.config
.dbus
.ipynb_checkpoints
.ipython
.jupyter
.lmod.d
.local
.npm
.nv
.ssh
__pycache__
data
gorepo
.bash_history
.bash_logout
Remote monitoring
Follow terminal folder
bottleneck pkgs/main/linux-64::bottleneck-1.3.2-py38heb32a55_1
numexpr pkgs/main/linux-64::numexpr-2.7.3-py38h22e1b3c_1
pandas pkgs/main/linux-64::pandas-1.3.2-py38h8c16a72_0
python-dateutil pkgs/main/noarch::python-dateutil-2.8.2-pyhd3eb1b0_0
pytz pkgs/main/noarch::pytz-2021.1-pyhd3eb1b0_0
Proceed ([y]/n)? y
Downloading and Extracting Packages
bottleneck-1.3.2 | 125 KB | ########## | 100%
pytz-2021.1 | 181 KB | ########## | 100%
numexpr-2.7.3 | 188 KB | ########## | 100%
python-dateutil-2.8. | 233 KB | ########## | 100%
pandas-1.3.2 | 9.6 MB | ########## | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
(pytorch_env) [prawat@node0160 ~]$ python
Python 3.8.3 (default, Jul 2 2020, 16:21:59)
[GCC 7.3.0] :: Anaconda, Inc. on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> import torch
print (torch.cuda.is_available())
File "<stdin>", line 1
print (torch.cuda.is_available())
^
SyntaxError: multiple statements found while compiling a single statement
>>> import torch
>>> print(torch.cuda.is_available())
True
>>>
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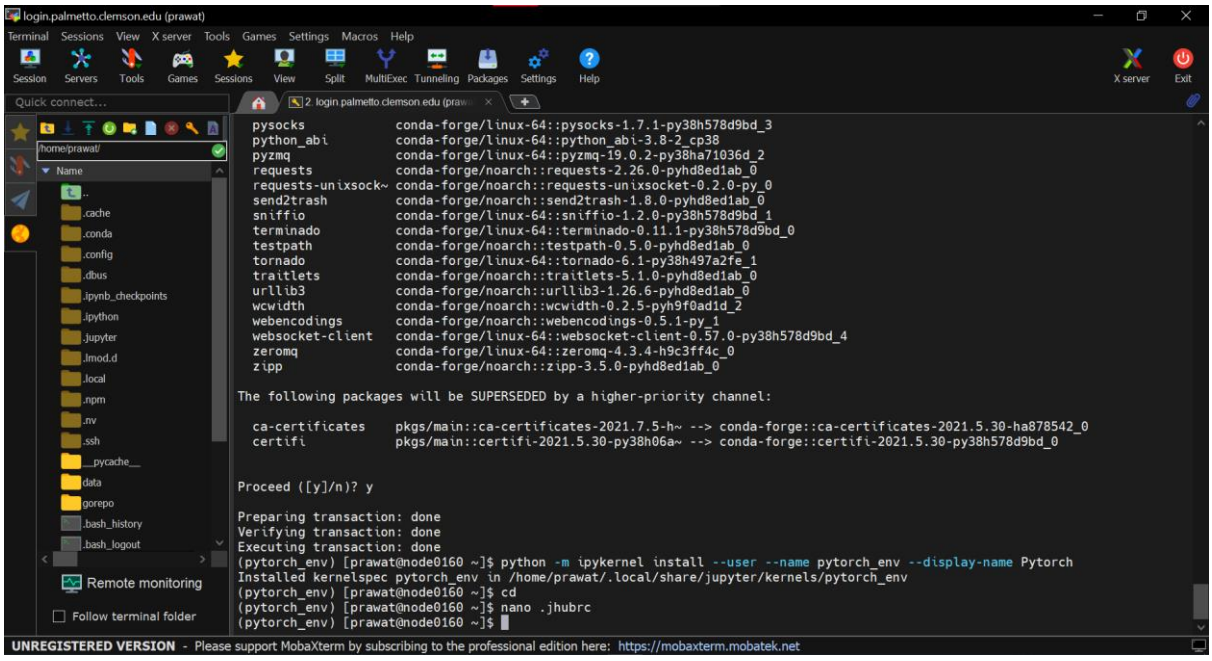
login.palmetto.clemson.edu (prawat)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
X server Exit
Quick connect...
2. login.palmetto.clemson.edu (prawa
/home/prawat/
Name
.cache
.conda
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.ipynb_checkpoints
.ipython
.jupyter
.lmod.d
.local
.npm
.nv
.ssh
__pycache__
data
gorepo
.bash_history
.bash_logout
Remote monitoring
Follow terminal folder
pysocks conda-forge/linux-64::pysocks-1.7.1-py38h578d9bd_3
python_abi conda-forge/linux-64::python_abi-3.8-2_cp38
pyzmq conda-forge/linux-64::pyzmq-19.0.2-py38ha71036d_2
requests conda-forge/noarch::requests-2.26.0-pyhd8ed1ab_0
requests-unixsock~ conda-forge/noarch::requests-unixsocket-0.2.0-py_0
send2trash conda-forge/noarch::send2trash-1.8.0-pyhd8ed1ab_0
sniffio conda-forge/linux-64::sniffio-1.2.0-py38h578d9bd_1
terminado conda-forge/linux-64::terminado-0.11.1-py38h578d9bd_0
testpath conda-forge/noarch::testpath-0.5.0-pyhd8ed1ab_0
tornado conda-forge/linux-64::tornado-6.1-py38h497a2fe_1
traitlets conda-forge/noarch::traitlets-5.1.0-pyhd8ed1ab_0
urllib3 conda-forge/noarch::urllib3-1.26.6-pyhd8ed1ab_0
wcwidth conda-forge/noarch::wcwidth-0.2.5-pyh9f0ad1d_2
webencodings conda-forge/noarch::webencodings-0.5.1-py_1
websocket-client conda-forge/linux-64::websocket-client-0.57.0-py38h578d9bd_4
zeromq conda-forge/linux-64::zeromq-4.3.4-h9c3ff4c_0
zipp conda-forge/noarch::zipp-3.5.0-pyhd8ed1ab_0
The following packages will be SUPERSEDED by a higher-priority channel:
ca-certificates pkgs/main::ca-certificates-2021.7.5-h~ --> conda-forge::ca-certificates-2021.5.30-ha878542_0
certifi pkgs/main::certifi-2021.5.30-py38h06a~ --> conda-forge::certifi-2021.5.30-py38h578d9bd_0
Proceed ([y]/n)? y
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
(pytorch_env) [prawat@node0160 ~]$ python -m ipykernel install --user --name pytorch_env --display-name Pytorch
Installed kernelspec pytorch_env in /home/prawat/.local/share/jupyter/kernels/pytorch_env
(pytorch_env) [prawat@node0160 ~]$ cd
(pytorch_env) [prawat@node0160 ~]$ nano .jhubrc
(pytorch_env) [prawat@node0160 ~]$
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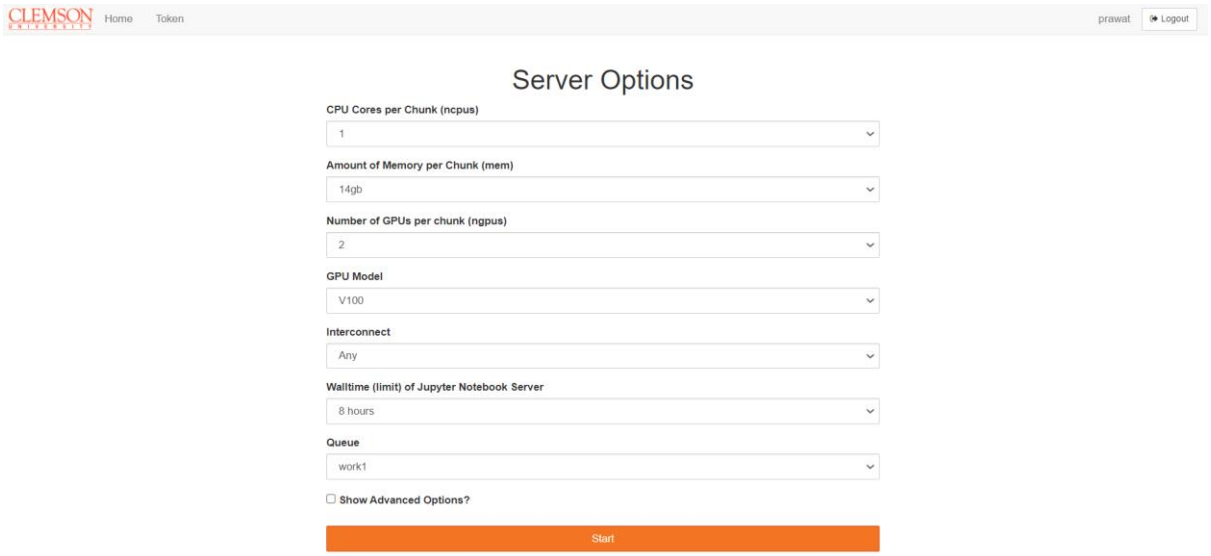
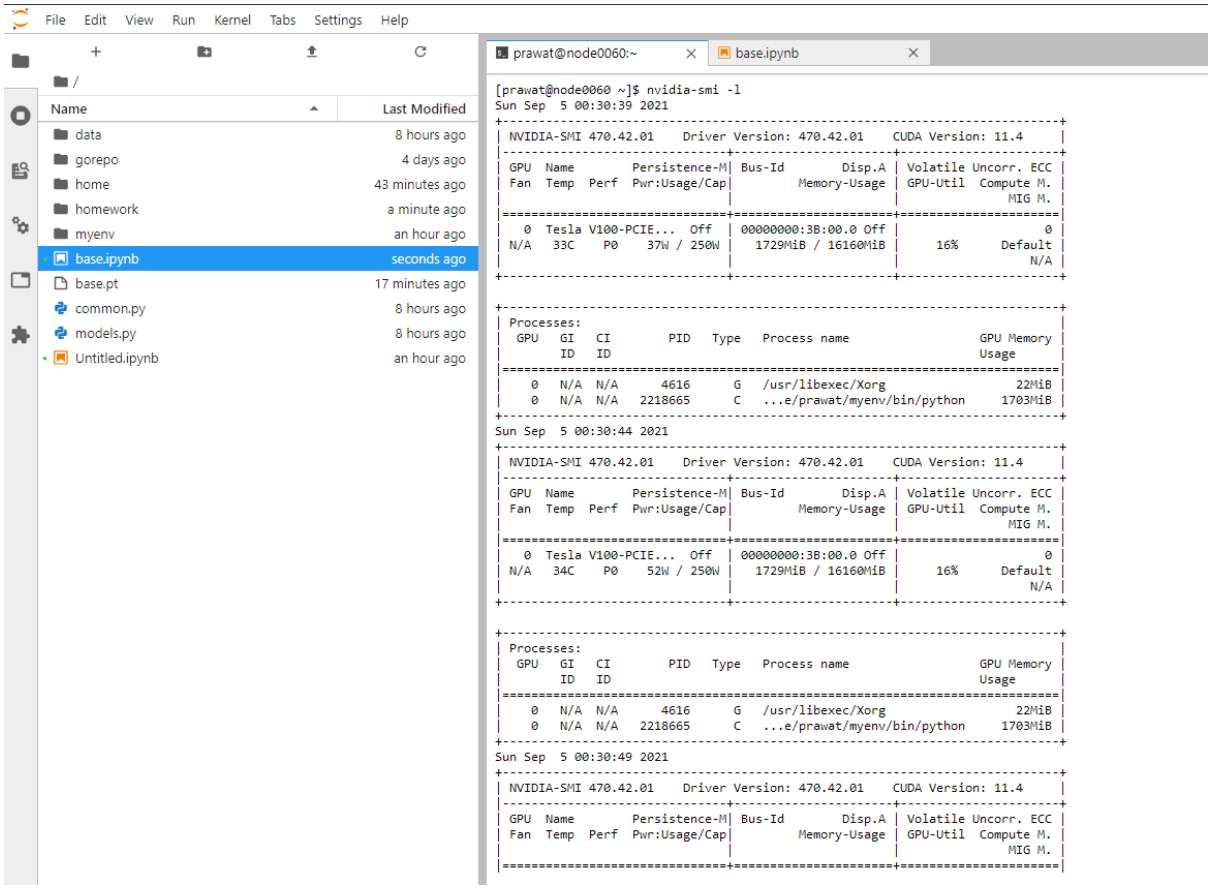
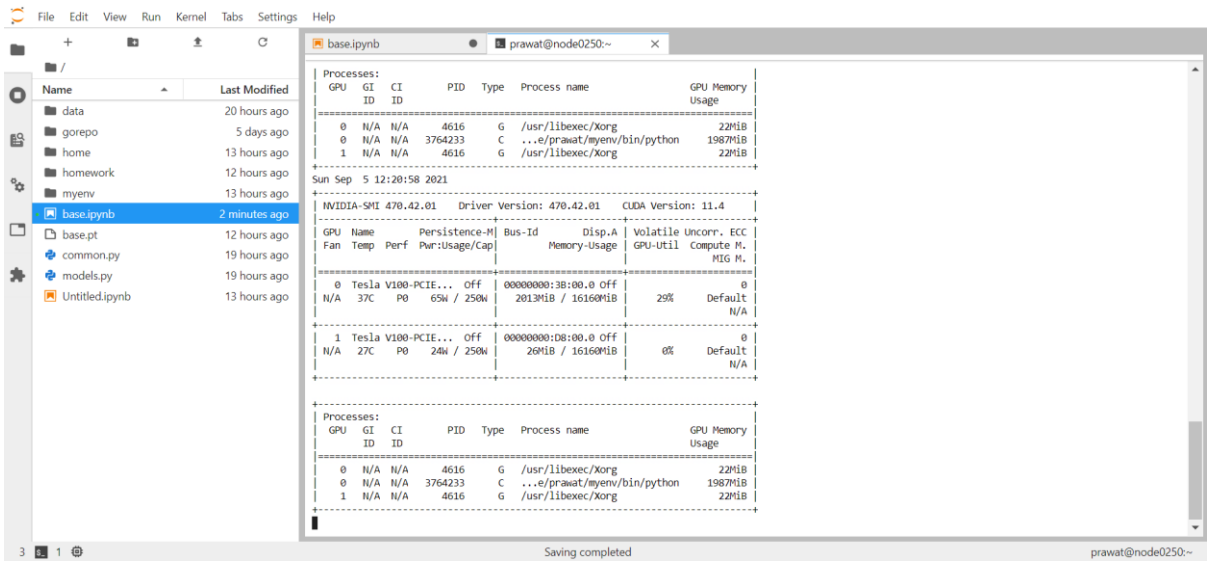


(2) Run the existing sample code "base.ipynb" (5 points)
During the training, what's your GPU usage percentage? (You can open another terminal and use "nvidia-smi –l" to monitor the usage info of GPU and GPU memory.)

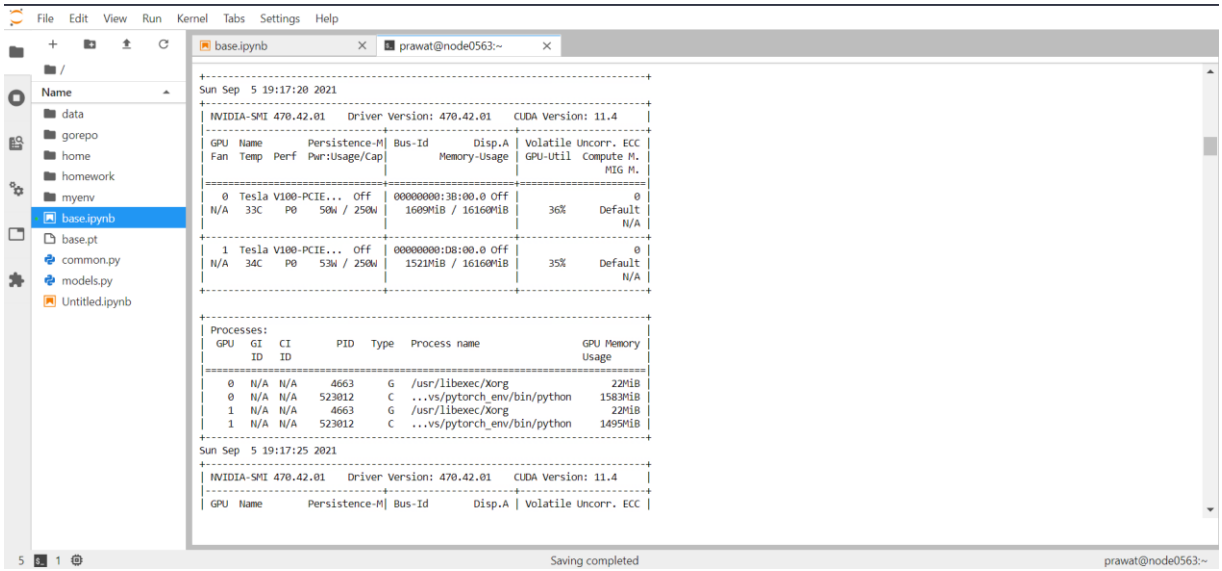


(3) Modify the code for better performance (change the batch size) (10 points)
During the training, what's your GPU usage percentage?

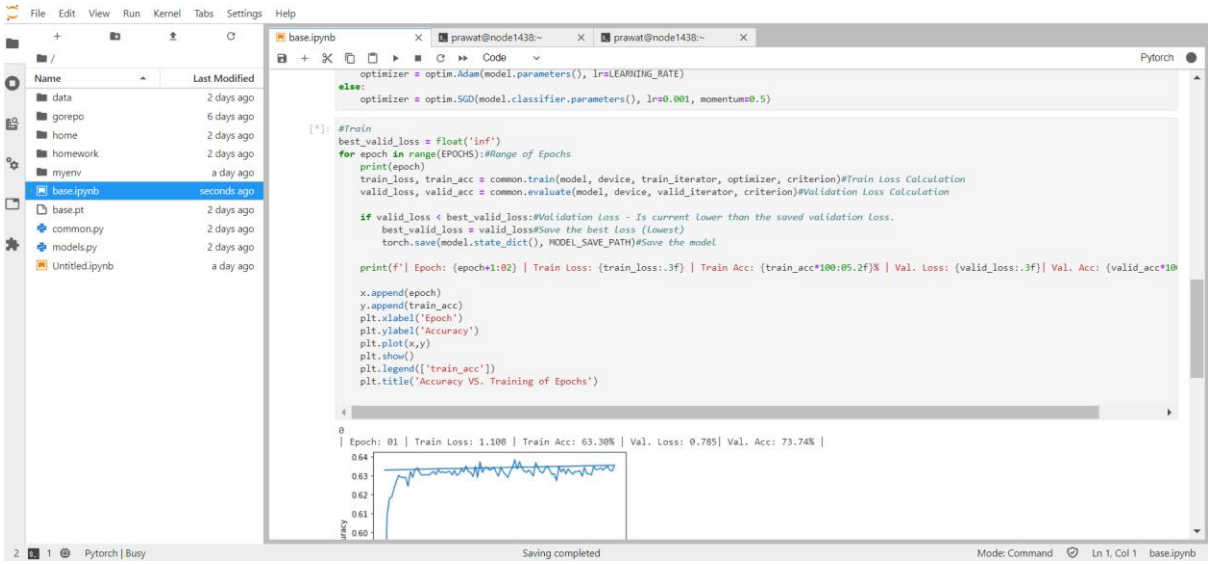
- I took the batch size = 8, and during training my GPU usage percentage increased to about 29%.

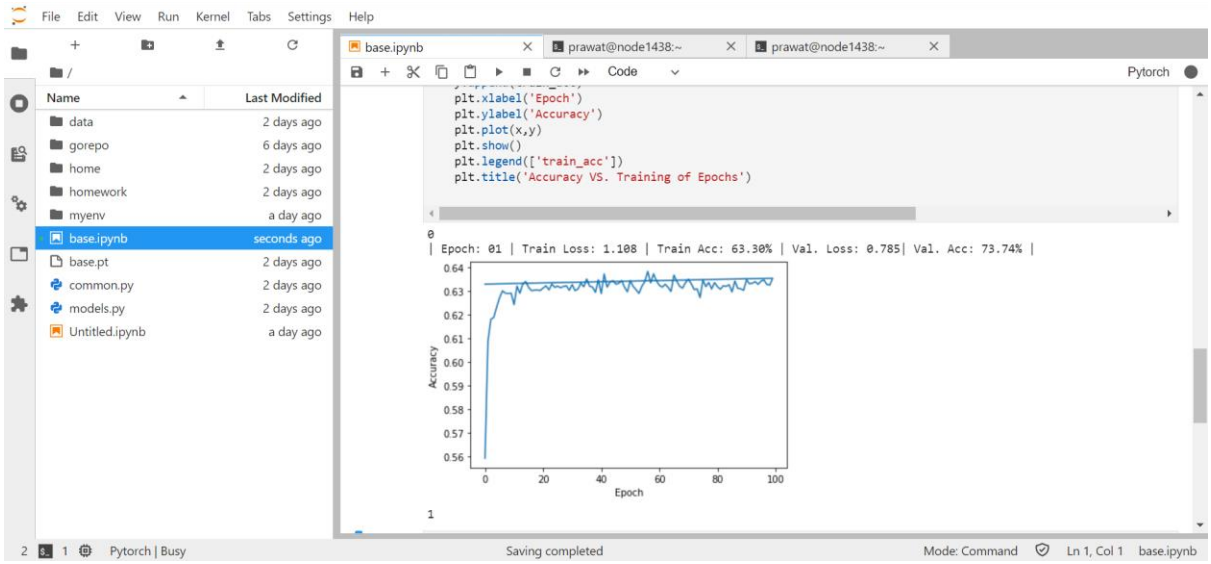


(4) Modify the code for better performance (use two GPUs) (10 points)
During the training, what's your GPU info percentage? (TIPS: [reference API](#))



(5) Plot the accuracy against the number of training Epochs on a Graph. (10 points) (TIPS: you need to import matplotlib, modify the code of "for epoch in range (EPOCHS):" by saving the "epoch" and "train_acc", and plot its relationship in the end)





(7) Perform a model inference for a certain image, which you can choose from anywhere. The image shall include the object which belongs to the category of the training dataset. (10 points) (TIPS: if you are using CIFAR10 datasets, its categories are shown in this reference)