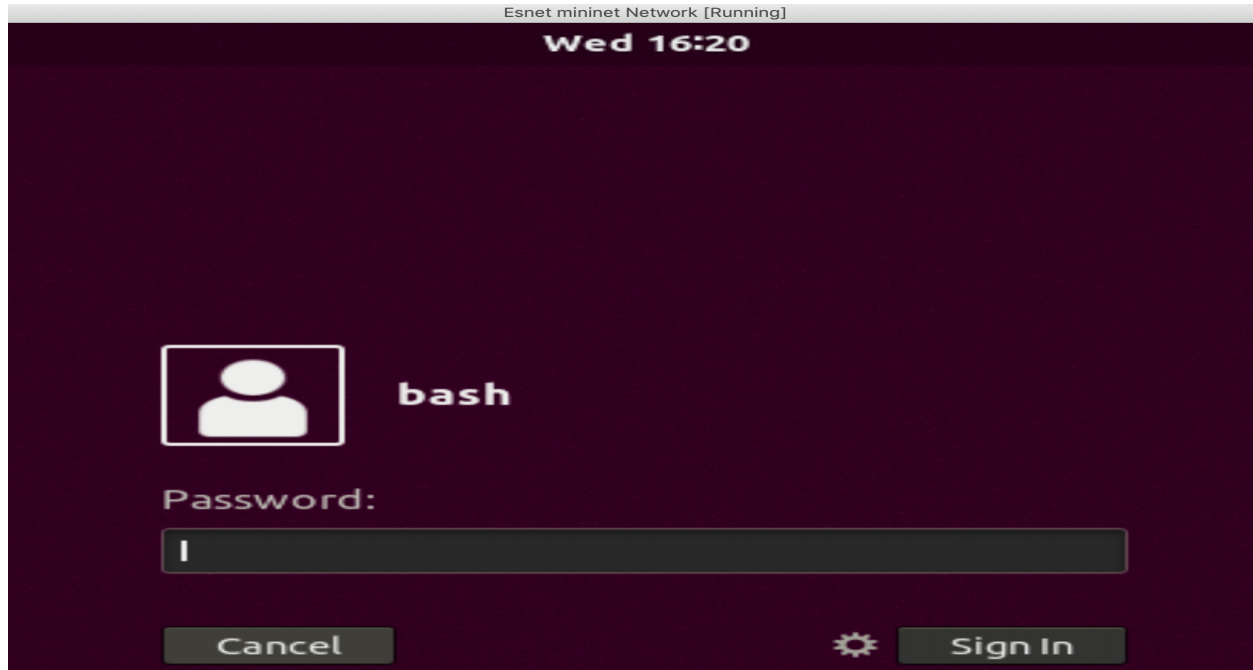


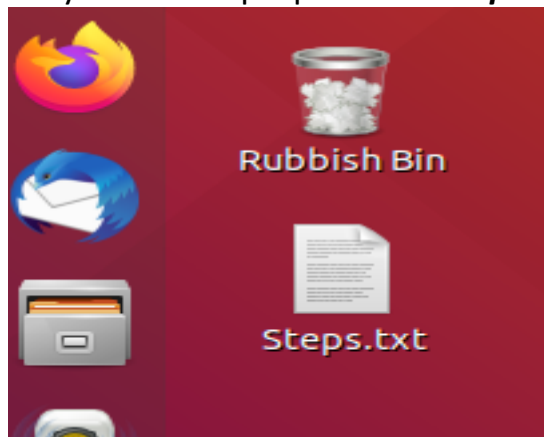
Method-1.
Cloned UBUNTU VM Installation:

Steps on how to run a DeepRoute RL and DQN Experiment using
Mininet as Backend

Password: *admin*



On your desktop Open a file ***Steps.txt*** and follow the steps



For the RL experiment:

Cd into ~/Documents/CodeRoom/DeepRoute-Gym-for-RL/tests

```
controller@controller-VirtualBox: ~/Documents/CodeRoom/DeepRoute-Gy...
File Edit View Search Terminal Help
controller@controller-VirtualBox:~/Documents/CodeRoom/DeepRoute-Gym-
-/tests$ ls
deterministic_trial.py      sdwan.errors.log
dqn_stat_model_100_run.h5   sdwan.info.log
dqn_stat_score_card_100.csv sdwan_rl_dqn_agent.ipynb
model.json                  sdwan_rl_dqn_agent.py
random_trial.py
controller@controller-VirtualBox:~/Documents/CodeRoom/DeepRoute-Gym-
for-RL/tests$ sudo python3 random_trial.py
```

run the following:

sudo python3 random_trial.py

sudo python3 deterministic_trial.py

```
controller@controller-VirtualBox:~/Documents/CodeRoom/DeepRoute-Gym-
-/tests$ ls
deterministic_trial.py      sdwan.errors.log
dqn_stat_model_100_run.h5   sdwan.info.log
dqn_stat_score_card_100.csv sdwan_rl_dqn_agent.ipynb
model.json                  sdwan_rl_dqn_agent.py
random_trial.py
controller@controller-VirtualBox:~/Documents/CodeRoom/DeepRoute-Gym-
for-RL/tests$ sudo python3 random_trial.py
[sudo] password for controller:
2019-12-25 16:48:26,987 - root - INFO - DeepRouteEnv - Version 0.1.0
DeepRoute Initial State: (0, '5.22', 5.09)
2019-12-25 16:49:12,900 - root - DEBUG - current bw:10.0, sla bw:6.0
Runs: 1 Action: 1 Ob: (1, 10.0, 3.3899999999999997) R: 0 Total Reward: 0
2019-12-25 16:49:27,919 - root - DEBUG - current bw:10.0, sla bw:6.0
Runs: 2 Action: 1 Ob: (1, 10.0, 6.34) R: 0 Total Reward: 0
2019-12-25 16:49:42,932 - root - DEBUG - current bw:3.96, sla bw:6.0
2019-12-25 16:49:42,932 - root - DEBUG - BW is less than SLA
Runs: 3 Action: 0 Ob: (0, '3.96', 3.75) R: -1 Total Reward: -1
Episode Finished after 3 timesteps
controller@controller-VirtualBox:~/Documents/CodeRoom/DeepRoute-Gym-
for-RL/tests$
```

OR

To save your results Files in .csv output format in the same directory

sudo python3 random_trial.py >> filename.csv

sudo python3 deterministic_trial.py >> filename.csv

In the **random_trail.py** and **deterministic_trail.py**, you can change the MAX_RUNS to any number like 30,60,100. I set it to 3.

Cd into ~/Documents/CodeRoom/DeepRoute-Gym-for-RL/tests
run the following:

```

This import gym
import gym_sdw
8
9 MAX_RUNS = 3
10 total_reward =
11
12 env = gym.make(
13
14 sla_bw = env.ba
15
16 observation = e
17
18 print('DeepRout
19
20 error = False
21 for t in range
22
23     link_id
24     current
25     availab
26
27     if float
28
29     else:
30
31
32
33
34
35

```

Your result should be outputted as .h5 format in the same directory.
You should also be able to view some error log files in case you want to view.

Method-2.

Installation steps from Scratch by cloning a Repo containing the code files.

Step one: Clone the github Repo.

In the Root Folder.

```
cd Documents/Coderoom/sdwan-gym-master/
```

```
###run the following to setup enviroment and to install all dependencies  
sudo python3 setup.py install
```

```
sudo pip3 install -e .
```

```
###install mininet backed
```

```
git clone git://github.com/mininet/mininet  
cd mininet/  
git tag  
git checkout -m
```

```
cd ..  
sudo mininet/util/install.sh -a  
ls
```

```
cd mininet/  
sudo python3 setup.py install
```

```
cd tests/  
ls
```

```
#### Run Random and Deterministic Experiment.
```

```
sudo python3 random_trial.py >> rand.csv  
sudo python3 deterministic_trial.py >> det.csv
```

#####FOR DQN EXPERIMENT #####

cd into your directory

sudo python3 setup.py install

sudo pip3 install -e .

pip3 install keras

pip3 install tensorflow

sudo python3 sdwan_rl_dqn_agent.py