

```
Last login: Fri Apr 10 08:20:02 on ttys001
Run-Mac:~ mac$ cd ~/.ssh
Run-Mac:~ mac$ ssh -i "Runzhe.pem" ubuntu@ec2-3-223-129-242.compute-1.amazonaws.com
Warning: Permanently added the ED25519 host key for IP address '3.223.129.242' to the list of known hosts.
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 4.15.0-1060-aws x86_64)
```

```
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage
```

System information as of Fri Apr 10 17:06:27 UTC 2020

```
System load:  0.25          Processes:      251
Usage of /:   28.6% of 30.96GB Users logged in: 0
Memory usage: 1%          IP address for ens5: 172.31.9.169
Swap usage:   0%
```

```
* Kubernetes 1.18 GA is now available! See https://microk8s.io for docs or
  install it with:
```

```
sudo snap install microk8s --channel=1.18 --classic
```

```
* Multipass 1.1 adds proxy support for developers behind enterprise
  firewalls. Rapid prototyping for cloud operations just got easier.
```

```
https://multipass.run/
```

```
* Canonical Livepatch is available for installation.
  - Reduce system reboots and improve kernel security. Activate at:
    https://ubuntu.com/livepatch
```

```
51 packages can be updated.
0 updates are security updates.
```

```
*** System restart required ***
```

```
Last login: Fri Apr 3 19:45:17 2020 from 107.13.161.147
ubuntu@ip-172-31-9-169:~$ export openblas_num_threads=1; export OMP_NUM_THREADS=1; python EC2.py
13:08, 04/10; num of cores:16w_0_1
```

```
Basic setting:[rep_times, sd_0, sd_D, sd_u_0, w_0, w_A, u_0_u_D, sd_R_range, t_func] = [16, None, None, 20, 1, 1, 0, [0, 10, 20], None]
```

```
-----
[pattern_seed, day, sd_R] = [2, 7, 0]
```

```
max(u_0) = 145.8
0_threshold = 90
number of reward locations: 14
0_threshold = 100
number of reward locations: 9
0_threshold = 110
number of reward locations: 6
target 1 in 3 DONE!
target 2 in 3 DONE!
target 3 in 3 DONE!
```

```
-----
Value of Behaviour policy:68.079
```

```
0_threshold = 90
MC for this TARGET:[77.449, 0.08]
[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-1.15, -1.3, -2.51]][[-0.65, -77.45, -9.37]]
std:[[0.35, 0.36, 0.28]][[0.3, 0.0, 0.18]]
MSE:[1.2, 1.35, 2.53]][[0.72, 77.45, 9.37]]
MSE(-DR):[[0.0, 0.15, 1.33]][[-0.48, 76.25, 8.17]]
```

```
=====
0_threshold = 100
MC for this TARGET:[75.056, 0.092]
[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-1.59, -1.68, -2.44]][[-2.12, -75.06, -6.98]]
std:[[0.51, 0.52, 0.37]][[0.32, 0.0, 0.18]]
MSE:[1.67, 1.76, 2.47]][[2.14, 75.06, 6.98]]
MSE(-DR):[[0.0, 0.09, 0.8]][[0.47, 73.39, 5.31]]
```

```
***
=====
0_threshold = 110
MC for this TARGET:[75.083, 0.087]
[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-3.83, -3.87, -4.39]][[-4.7, -75.08, -7.0]]
std:[[0.43, 0.42, 0.38]][[0.33, 0.0, 0.18]]
MSE:[3.85, 3.89, 4.41]][[4.71, 75.08, 7.0]]
MSE(-DR):[[0.0, 0.04, 0.56]][[0.86, 71.23, 3.15]]
```

```
***
=====
[[ 1.2   1.35   2.53   0.72  77.45   9.37]
 [ 1.67   1.76   2.47   2.14  75.06   6.98]
 [ 3.85   3.89   4.41   4.71  75.08   7.  ]]
```

time spent until now: 29.2 mins

13:37, 04/10

[pattern_seed, day, sd_R] = [2, 7, 10]

max(u_0) = 145.8
0_threshold = 90
number of reward locations: 14
0_threshold = 100
number of reward locations: 9
0_threshold = 110
number of reward locations: 6
target 1 in 3 DONE!
target 2 in 3 DONE!
target 3 in 3 DONE!

Value of Behaviour policy:68.065

0_threshold = 90

MC for this TARGET:[77.465, 0.145]

[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-0.97, -1.12, -2.41]][[-0.59, -77.46, -9.4]]
std:[[0.5, 0.52, 0.32]][[0.38, 0.0, 0.14]]
MSE:[1.09, 1.23, 2.43]][[0.7, 77.46, 9.4]]
MSE(-DR):[0.0, 0.14, 1.34]][[-0.39, 76.37, 8.31]]

=====

0_threshold = 100

MC for this TARGET:[75.072, 0.153]

[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-1.59, -1.66, -2.49]][[-2.14, -75.07, -7.01]]
std:[[0.65, 0.67, 0.43]][[0.32, 0.0, 0.14]]
MSE:[1.72, 1.79, 2.53]][[2.16, 75.07, 7.01]]
MSE(-DR):[0.0, 0.07, 0.81]][[0.44, 73.35, 5.29]]

=====

0_threshold = 110

MC for this TARGET:[75.099, 0.144]

[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-3.72, -3.78, -4.41]][[-4.72, -75.1, -7.03]]
std:[[0.58, 0.59, 0.44]][[0.32, 0.0, 0.14]]
MSE:[3.76, 3.83, 4.43]][[4.73, 75.1, 7.03]]
MSE(-DR):[0.0, 0.07, 0.67]][[0.97, 71.34, 3.27]]

=====

[[1.2 1.35 2.53 0.72 77.45 9.37]
[1.67 1.76 2.47 2.14 75.06 6.98]
[3.85 3.89 4.41 4.71 75.08 7.]]

[[1.09 1.23 2.43 0.7 77.46 9.4]
[1.72 1.79 2.53 2.16 75.07 7.01]
[3.76 3.83 4.43 4.73 75.1 7.03]]

time spent until now: 58.1 mins

14:06, 04/10

[pattern_seed, day, sd_R] = [2, 7, 20]

max(u_0) = 145.8
0_threshold = 90
number of reward locations: 14
0_threshold = 100
number of reward locations: 9
0_threshold = 110
number of reward locations: 6
target 1 in 3 DONE!
target 2 in 3 DONE!
target 3 in 3 DONE!

Value of Behaviour policy:68.051

0_threshold = 90

MC for this TARGET:[77.481, 0.25]

[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-0.79, -0.95, -2.28]][[-0.53, -77.48, -9.43]]
std:[[0.79, 0.81, 0.48]][[0.54, 0.0, 0.18]]
MSE:[1.12, 1.25, 2.33]][[0.76, 77.48, 9.43]]
MSE(-DR):[0.0, 0.13, 1.21]][[-0.36, 76.36, 8.31]]

=====

0_threshold = 100

MC for this TARGET:[75.088, 0.256]

[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-1.56, -1.65, -2.53]][[-2.16, -75.09, -7.04]]

```

std:[[1.0, 1.04, 0.58]][[0.44, 0.0, 0.18]]
MSE:[[1.85, 1.95, 2.6]][[2.2, 75.09, 7.04]]
MSE(-DR):[[0.0, 0.1, 0.75]][[0.35, 73.24, 5.19]]
***
=====
0_threshold = 110
MC for this TARGET:[75.115, 0.247]
[DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-3.68, -3.71, -4.45]][[-4.75, -75.11, -7.06]]
std:[[0.94, 0.96, 0.66]][[0.44, 0.0, 0.18]]
MSE:[[3.8, 3.83, 4.5]][[4.77, 75.11, 7.06]]
MSE(-DR):[[0.0, 0.03, 0.7]][[0.97, 71.31, 3.26]]
***
=====
[[ 1.2   1.35  2.53  0.72 77.45  9.37]
 [ 1.67  1.76  2.47  2.14 75.06  6.98]
 [ 3.85  3.89  4.41  4.71 75.08  7.  ]]

[[ 1.09  1.23  2.43  0.7  77.46  9.4 ]
 [ 1.72  1.79  2.53  2.16 75.07  7.01]
 [ 3.76  3.83  4.43  4.73 75.1  7.03]]

[[ 1.12  1.25  2.33  0.76 77.48  9.43]
 [ 1.85  1.95  2.6  2.2  75.09  7.04]
 [ 3.8  3.83  4.5  4.77 75.11  7.06]]

time spent until now: 87.1 mins

14:35, 04/10
ubuntu@ip-172-31-9-169:~$ w_0_1

```