```
Last login: Sun Apr 12 15:52:15 on ttys001
Run-Mac:~ mac$ cd ~/.ssh
Run-Mac:.ssh mac$ ssh -i "Runzhe.pem" ubuntu@ec2-3-235-53-132.compute-1.amazonaws.com
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 Sun Apr 12 19:53:48 UTC 2020

  System load:  0.56               Processes:           212
  Usage of /:   28.6% of 30.96GB   Users logged in:     0
  Memory usage: 1%                 IP address for ens5: 172.31.5.25
  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: Sun Apr 12 19:52:19 2020 from 107.13.161.147
ubuntu@ip-172-31-5-25:~$ export openblas_num_threads=1; export OMP_NUM_THREADS=1; python EC2.py
15:53, 04/12; num of cores:16
rerun_15_after_tuning

Basic setting:[rep_times, sd_O, sd_D, sd_u_O, w_O, w_A, u_O_u_D, t_func] = [16, None, None, 20, 0.5, 1.5, 0, None]

thre_range, sd_R_range, day_range:  [[100, 105], [0, 15, 30], [7]]

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

max(u_O) =  145.8
O_threshold = 100
number of reward locations:  9
O_threshold = 105
number of reward locations:  7
True True [0.01, 0.01] 718.3291897317498
True True [0.01, 0.01] 766.493348532777
True True [0.0001, 0.01] 667.0096452324838
True True [0.01, 0.01] 595.7579680597235
True True [0.01, 0.01] 395.1885244871005
True True [0.01, 0.01] 742.4498884821
True True [0.01, 0.01] 646.8868511511093
True True [0.01, 0.01] 661.6563564729579
True True [0.01, 0.01] 420.7123196362704
True True [0.01, 0.01] 775.9352008816616
True True [0.01, 0.01] 531.8373945590146
True True [0.01, 0.01] 663.9645374619508
True True [0.01, 0.01] 880.6045856258086
True True [0.01, 0.01] 671.9429109022894
True True [0.01, 0.01] 641.8303796362005
True True [0.01, 0.01] 647.0407621024848
False True [0.0001, 0.0001] 294.0229634646089
False True [0.0001, 0.01] 802.7965281299238
False True [0.0001, 0.01] 956.2243544937566
False True [0.001, 0.01] 791.7332315315399
False True [0.01, 0.01] 853.7309322731137
False True [0.01, 0.01] 810.9093177908262
False True [0.01, 0.01] 933.5988373004519
False True [0.0001, 0.01] 727.1723351448545
False True [0.0001, 0.01] 777.3011532274597
False True [0.001, 0.01] 624.0377851278582
False True [0.0001, 0.0001] 642.7886147347992
False True [0.0001, 0.0001] 503.32546748269436
False True [0.0001, 0.0001] 599.8697452654673
False True [0.0001, 0.01] 869.2226849624499
False True [0.0001, 0.0001] 670.9971268421979
False True [0.001, 0.0001] 695.8052434257108
True True [0.01, 0.01] 42.623978188494775
True True [0.01, 0.01] 97.63192873006959
True True [0.01, 0.01] 82.58038694795079
True True [0.01, 0.0001] 99.02322670482128
True True [0.01, 0.01] 60.275778222810146
```

```
False True [0.0001, 0.0001] 65.2454432778344
True True [0.01, 0.01] 188.16164661059776
True True [0.01, 0.01] 367.2462850078517
True True [0.01, 0.01] 152.7300536258354
True True [0.01, 0.01] 178.8403822234028
True True [0.01, 0.01] 275.3477239121397
False True [0.01, 0.01] 255.2857175803005
True True [0.01, 0.01] 368.60733679485645
False True [0.01, 0.01] 195.53723110918892
False True [0.01, 0.01] 206.83684968363312
False True [0.01, 0.01] 251.91773521933413
False True [0.001, 0.0001] 190.59237948951318
True True [0.01, 0.01] 265.4261532856602
False True [0.01, 0.01] 242.90291183269318
False True [0.01, 0.01] 250.13793312456568
True True [0.01, 0.01] 180.75768972090643
False True [0.0001, 0.0001] 135.68928354119117
False True [0.01, 0.01] 227.90874598751924
False True [0.01, 0.01] 252.79154885000366
False True [0.01, 0.01] 228.0010026307458
False True [0.01, 0.01] 890.6631258422232
False True [0.01, 0.01] 151.19111188119692
True True [0.01, 0.01] 119.24759113007185
False True [0.01, 0.01] 273.39505769407583
True True [0.01, 0.01] 192.38953922609272
True True [0.01, 0.01] 99.6307169343491
True True [0.01, 0.01] 64.39698861141272
True True [0.01, 0.01] 70.90106940801928
False True [0.0001, 0.0001] 702.5746949251927
True True [0.01, 0.01] 88.43244429481132
True True [0.01, 0.01] 231.8099296502753
False True [0.0001, 0.0001] 345.22834708438864
True True [0.01, 0.01] 334.6350498094058
True True [0.01, 0.01] 173.37681315305812
True True [0.01, 0.01] 183.39613806155353
True True [0.01, 0.01] 126.04520515419549
False True [0.01, 0.01] 683.0466451660029
True True [0.01, 0.01] 215.13783286815286
True True [0.01, 0.01] 99.65802696038222
False True [0.01, 0.01] 636.7388206028627
False True [0.0001, 0.0001] 532.1379763022242
False True [0.001, 0.0001] 689.9205803472153
False True [0.0001, 0.0001] 782.1377140588709
False True [0.0001, 0.0001] 309.7145762667606
False True [0.01, 0.01] 850.6491226354434
False True [0.001, 0.0001] 843.7096921789549
False True [0.0001, 0.0001] 506.6667969224936
False True [0.0001, 0.01] 807.787587466792
False True [0.0001, 0.01] 813.994815376248
False True [0.0001, 0.0001] 720.7864100165441
False True [0.0001, 0.0001] 361.51741444862006
target 2 in 2 DONE!

----------------------------------------
Value of Behaviour policy:55.239
O_threshold = 100
MC for this TARGET:[60.446, 0.085]
   [DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-0.95, -2.32, -0.78]][[-0.24, -60.45, -5.21]]
std:[[0.42, 0.41, 0.38]][[0.37, 0.0, 0.23]]
MSE:[[1.04, 2.36, 0.87]][[0.44, 60.45, 5.22]]
MSE(-DR):[[0.0, 1.32, -0.17]][[-0.6, 59.41, 4.18]]
==============
O_threshold = 105
MC for this TARGET:[61.202, 0.07]
   [DR/QV/IS]; [DR_NO_MARL, DR_NO_MF, V_behav]
bias:[[-3.55, -4.91, -3.29]][[-3.54, -61.2, -5.96]]
std:[[0.5, 0.57, 0.35]][[0.35, 0.0, 0.23]]
MSE:[[3.59, 4.94, 3.31]][[3.56, 61.2, 5.96]]
MSE(-DR):[[0.0, 1.35, -0.28]][[-0.03, 57.61, 2.37]]
==============
[[ 1.04  2.36  0.87  0.44 60.45  5.22]
 [ 3.59  4.94  3.31  3.56 61.2   5.96]]


time spent until now: 23.4 mins

16:17, 04/12

----------------------------------------
[pattern_seed, day, sd_R] = [2, 7, 15]

max(u_O) =  145.8
O_threshold = 100
number of reward locations:  9
O_threshold = 105
number of reward locations:  7
True True [0.01, 0.01] 550.9803907778861
True True [0.01, 0.01] 673.0214483889109
```