CENG 222 HOMEWORK 4-5 REPORTS

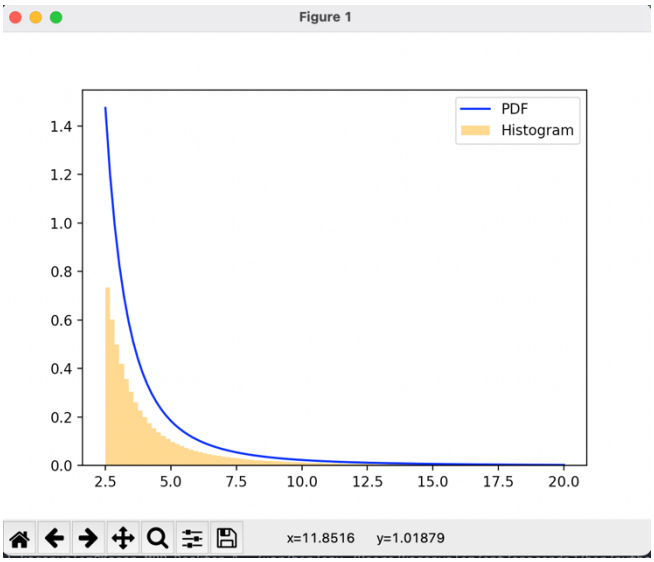
Mustafa Kağan Yalım
270201090

Outputs:

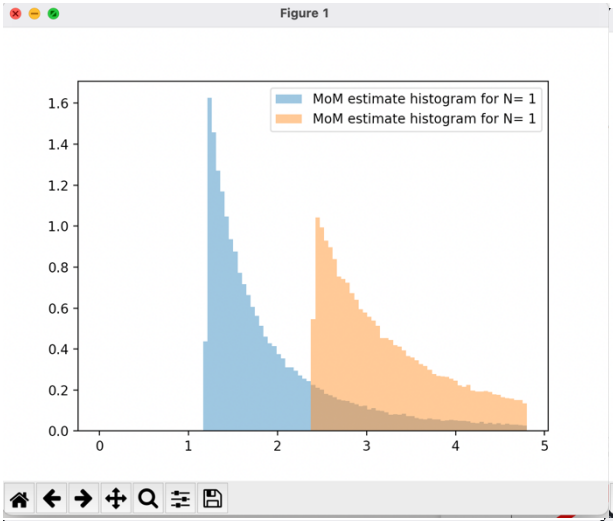
```
(base) kaganyalim@Kagan-MBP Desktop % /Users/kaganyalim/opt/anaconda3/bin/python /Users/kaganyalim/Desktop/ceng222hw4.py
MoM estimate for the sample is  0.325
MLE estimate for the sample is  0.3
For N =1:
MoM estimate mean:  2.395487876380141   MoM estimate std:  3.2940683308791643
MLE estimate mean:  4.790975752760282   MLE estimate std:  6.588136661758329
For N =2:
MoM estimate mean:  2.4034021516940163  MoM estimate std:  2.9970035557923724
MLE estimate mean:  3.1954609434346026  MLE estimate std:  1.1222191434778566
For N =3:
MoM estimate mean:  2.3857112615533143  MoM estimate std:  1.9503478548721993
MLE estimate mean:  2.879694427639117   MLE estimate std:  0.5792508412262829
For N =4:
MoM estimate mean:  2.391257308192665   MoM estimate std:  1.69576455276499
MLE estimate mean:  2.74234417464312    MLE estimate std:  0.39666358129280604
For N =5:
MoM estimate mean:  2.4099237970134197  MoM estimate std:  2.4308796345346955
MLE estimate mean:  2.667366412158603   MLE estimate std:  0.2970916892577741
For N =10:
MoM estimate mean:  2.4060098560489442  MoM estimate std:  1.2929105135616026
MLE estimate mean:  2.5264925832816902  MLE estimate std:  0.13325418454761043
For N =50:
MoM estimate mean:  2.399164544785514   MoM estimate std:  0.5721769463296017
MLE estimate mean:  2.424288862687439   MLE estimate std:  0.024330900029065853
For N =100:
MoM estimate mean:  2.400094821570923   MoM estimate std:  0.42694190812395527
MLE estimate mean:  2.412108027178779   MLE estimate std:  0.012187220530715017
For N =500:
MoM estimate mean:  2.3990905415670767  MoM estimate std:  0.18060166580432271
MLE estimate mean:  2.4024083861053565  MLE estimate std:  0.002408612622180012
For N =1000:
MoM estimate mean:  2.400092655573474   MoM estimate std:  0.1296923655052061
MLE estimate mean:  2.401209154645006   MLE estimate std:  0.001209696008710337
(base) kaganyalim@Kagan-MBP Desktop %
```

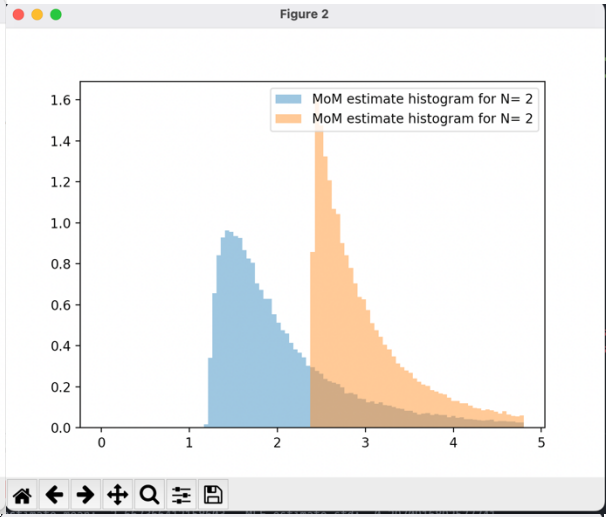
Figures:

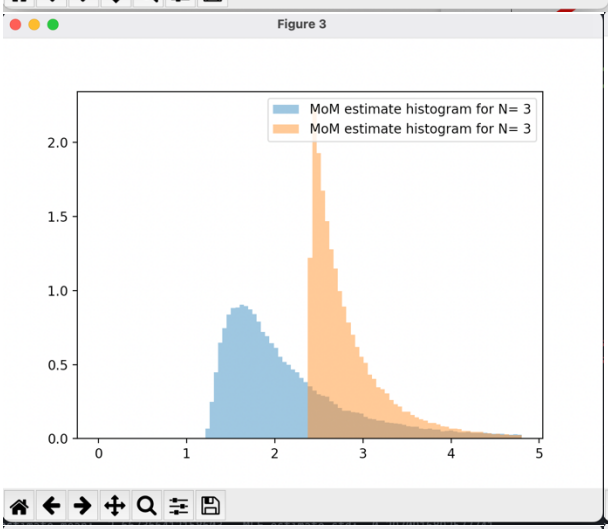
Part b figure:

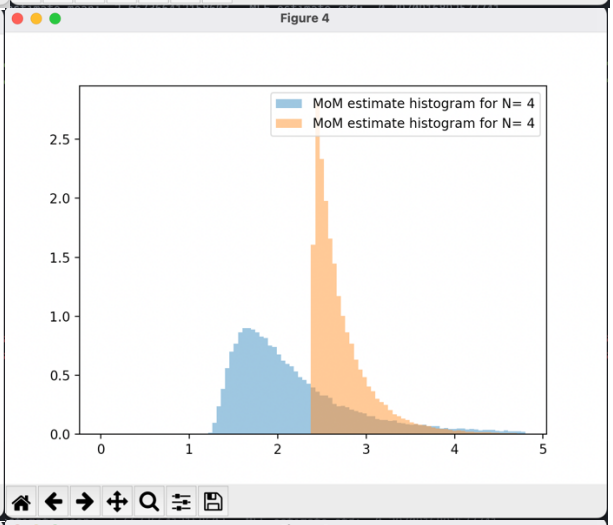


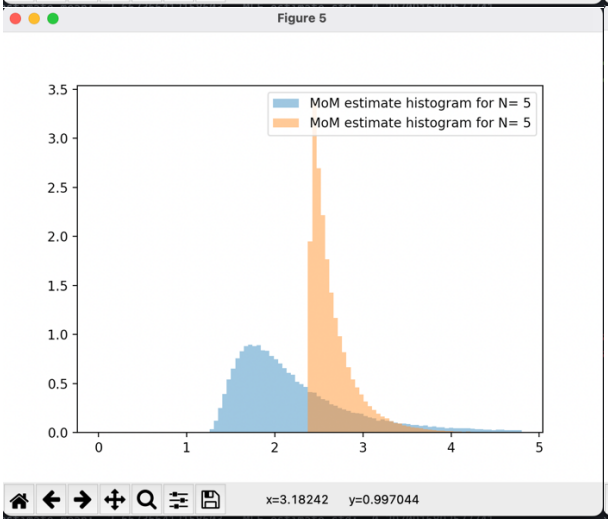
Part c figures:

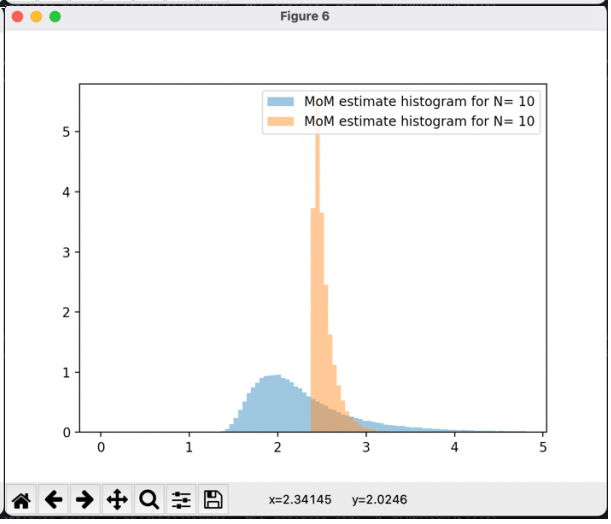












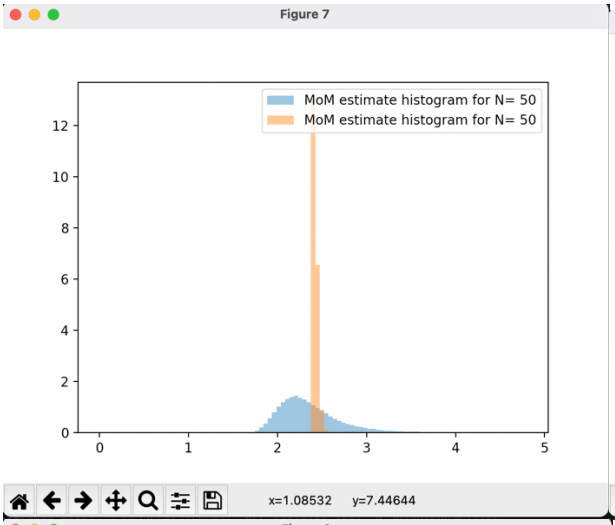


Figure 7
MoM estimate histogram for N= 50
MoM estimate histogram for N= 50
x=1.08532 y=7.44644

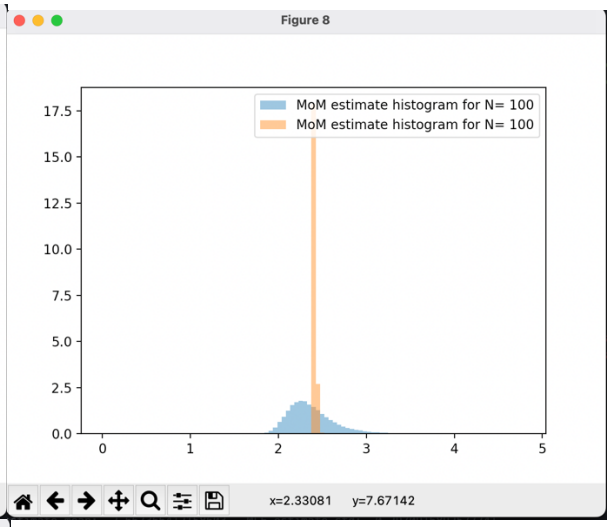


Figure 8
MoM estimate histogram for N= 100
MoM estimate histogram for N= 100
x=2.33081 y=7.67142

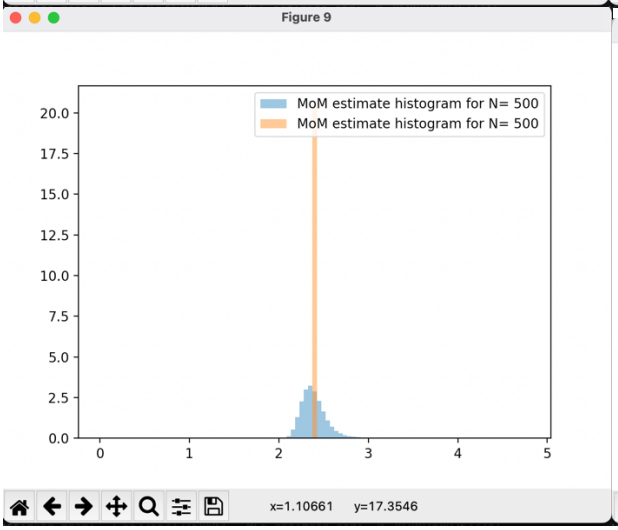


Figure 9
MoM estimate histogram for N= 500
MoM estimate histogram for N= 500
x=1.10661 y=17.3546

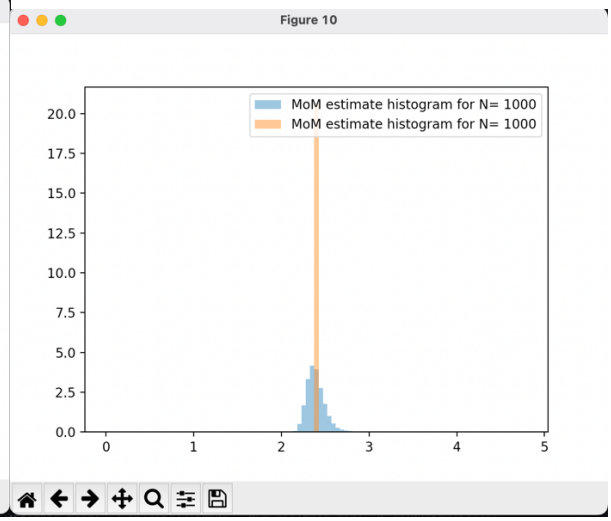


Figure 10
MoM estimate histogram for N= 1000
MoM estimate histogram for N= 1000

Mathematical Calculations: