Problem Set 3

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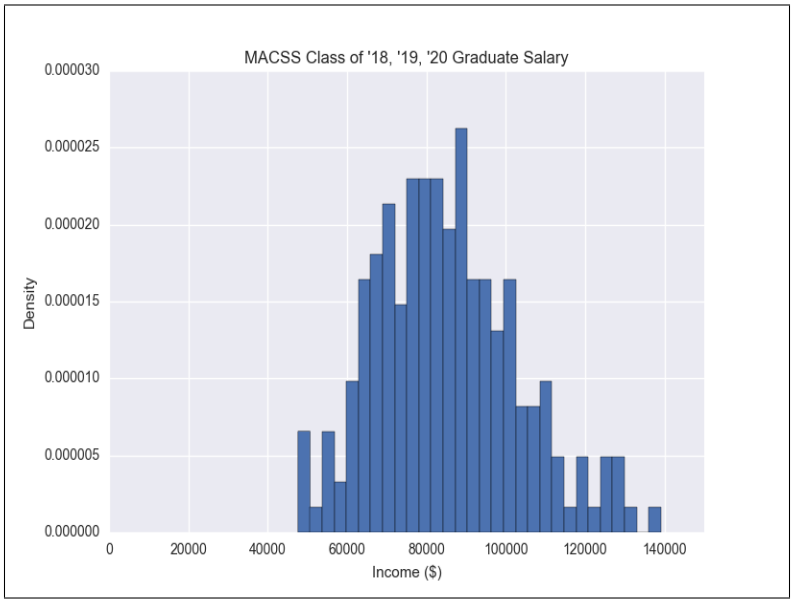
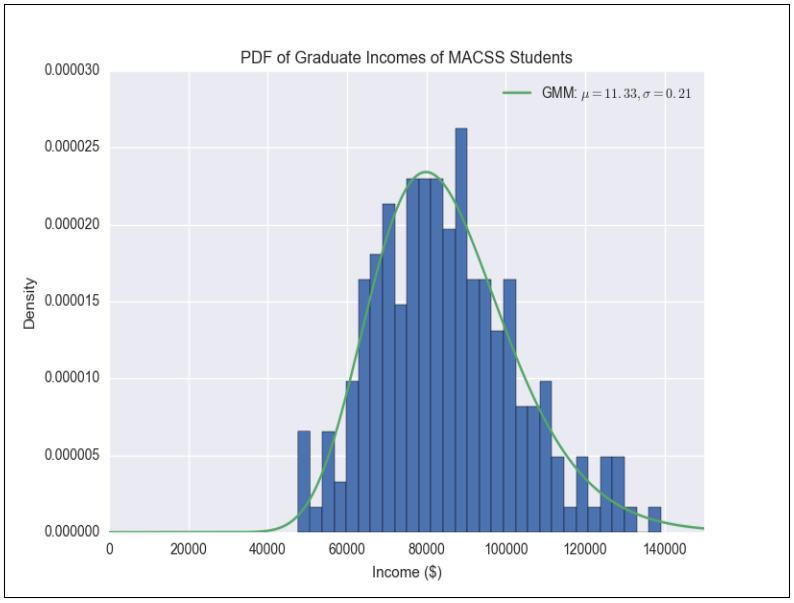
Problem 1

Part (a).



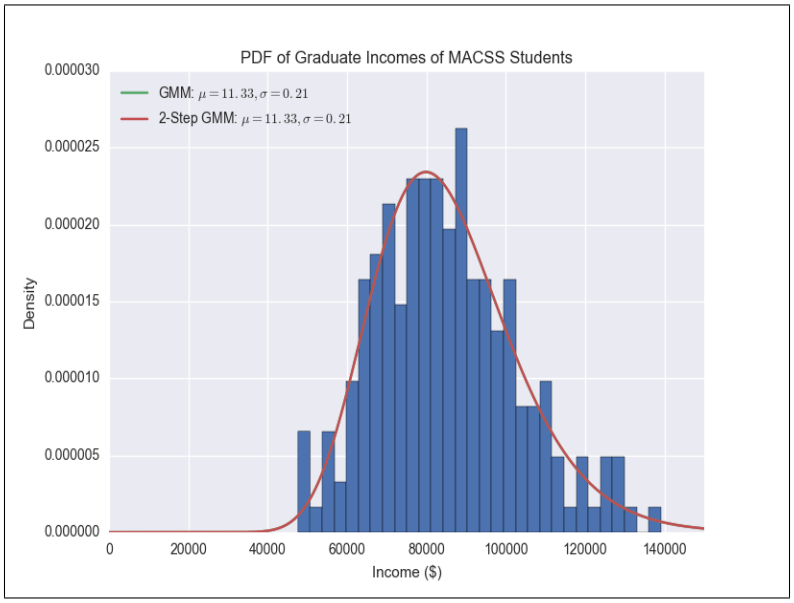
Part (b).



μ_{GMM} : 11.33, σ_{GMM} : 0.21

The value of the GMM criterion function: 1.527969312041055e-15
Data moments: mean: 85276.82, std: 17992.54
Model moments: mean: 85276.83, std: 17992.54
The data moments and model moments are about the same.

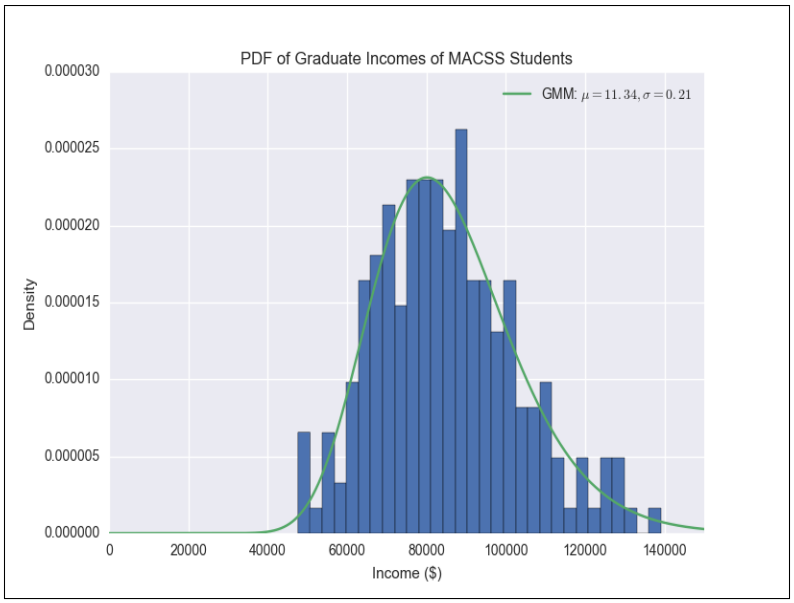
Part (c).



$\mu_{mle} = 11.33, \sigma_{mle} = 0.21$
The value of the GMM criterion function: 2.1285610191427995e-05
Data moments: mean: 85276.82, std: 17992.54
Model moments: mean: 85276.83, std: 17992.54
The data moments and model moments are about the same, and they are also similar to the previous moments.

Part (d).
μ_{GMM} : 11.34, σ_{GMM} : 0.21
The value of the GMM criterion function: 6.505942554065515e-09
Data moments: 0.30, 0.50, 0.20
Model moments: 0.30, 0.50, 0.20
Again, the data moments and model moments are about the same.

Part (e).
μ_{GMM} : 11.34, σ_{GMM} : 0.21
The value of the GMM criterion function: 3.601013055520852e-07
Data moments: 0.30, 0.50, 0.20
Model moments: 0.29, 0.50, 0.21
The data moments and model moments are about the same, and they are similar to the previous moments.



Part (f).

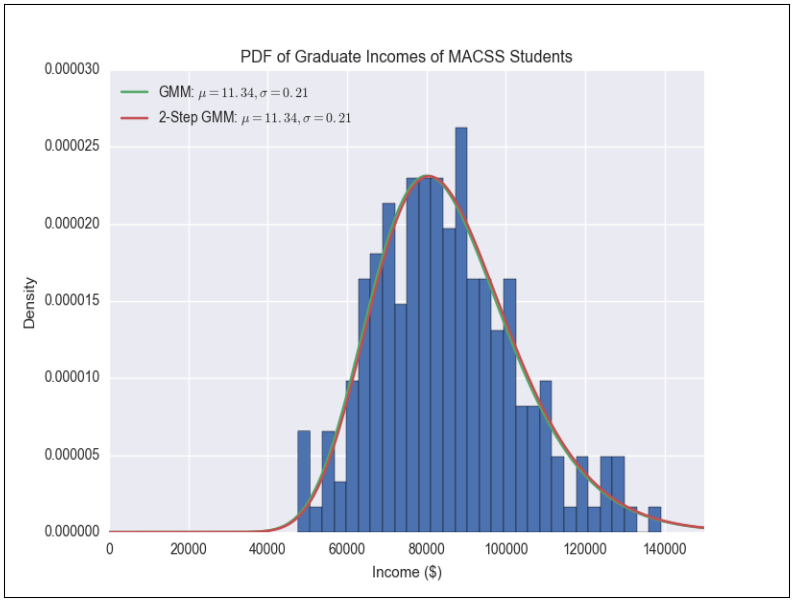
From the plots we can see there is no significant difference between models, which also applies to the comparison between data moments and model moments. From my perspective, the 2-step GMM model from (e) is the best because the customized moments are "tailored" to fit the characteristics of the data, and it works well on the graph.

Problem 2

Part (a).

The GMM estimates for $\beta_0, \beta_1, \beta_2, \beta_3$ are 0.2516447359381598, 0.01293345092463209, 0.4005011753872412, -0.009991695557197486

The value of the criterion function: 0.00182128981702


PDF of Graduate Incomes of MACSS Students
GMM: $\mu = 11.34, \sigma = 0.21$
2-Step GMM: $\mu = 11.34, \sigma = 0.21$
Density
0.000030
0.000025
0.000020
0.000015
0.000010
0.000005
0.000000
0
20000
40000
60000
80000
100000
120000
140000
Income ($)