Problem Set #3

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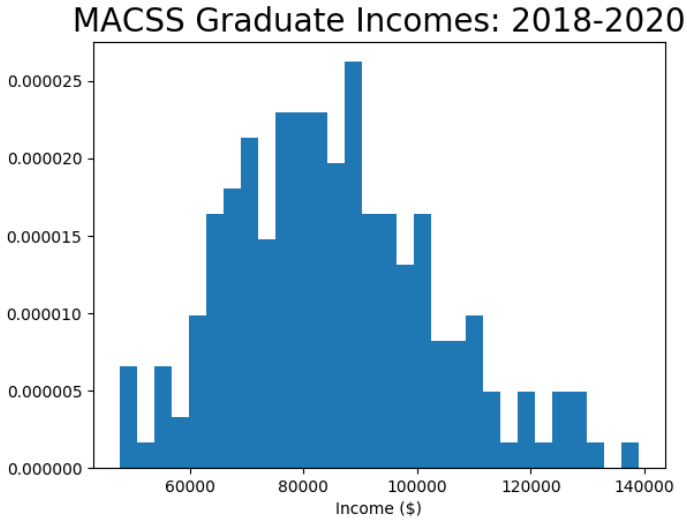
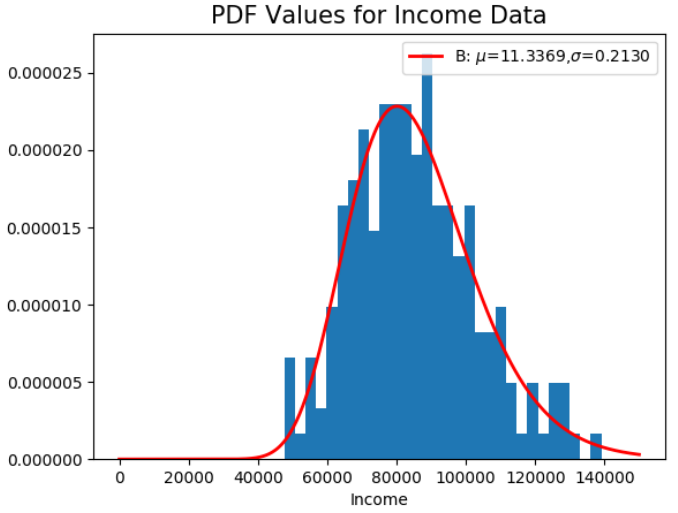
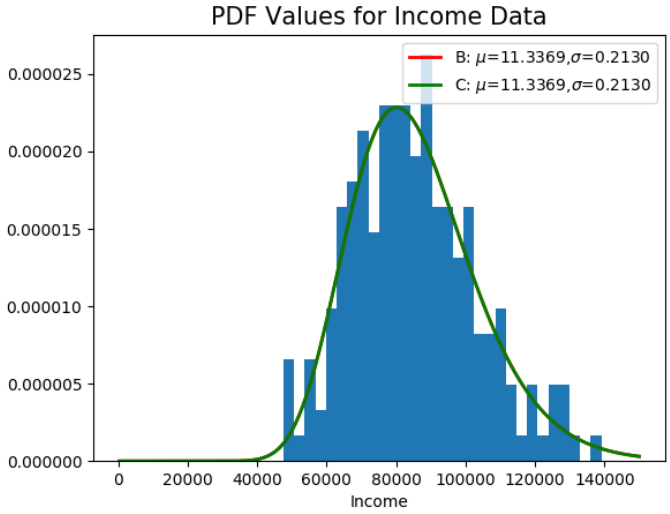
Part a:



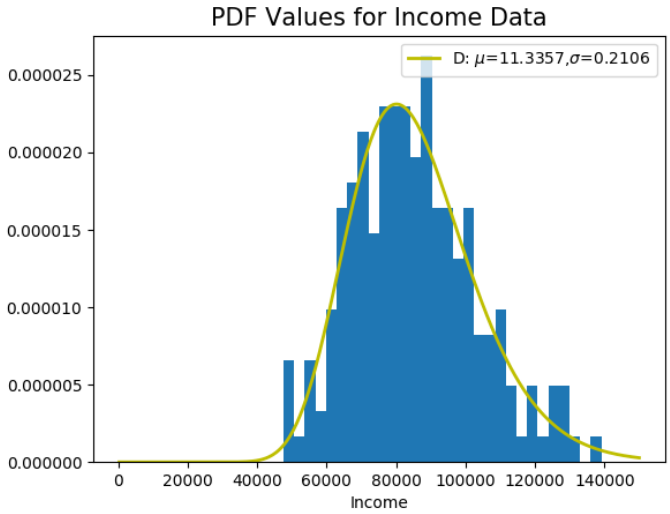
Part b: The value of the GMM criterion function is 1.84964514106e-14 at the estimated parameters mu = 11.336910222 and sig = 0.213027089137.
The data moments are: Mean of data = 85276.8236063, Variance of data = 323731572.23
The model moments are: Mean of model = 85276.81387603687, Variance of model = 323731548.27059644
The data and model mean are nearly indistinguishable and the variance of the model is lower than the variance of the data.



Part c: The value of the GMM criterion function is 0.0122563794849 at the estimated parameters mu = 11.3369102322 and sig = 0.213027115547.
The data moments are: Mean of data = 85276.8236063, Variance of data = 323731572.23
The model moments are: Mean of model = 85276.81387603687, Variance of model = 323731548.27059644
Once again, the mean of the data and the mean of the model are almost identical and the model variance is lower than the data variance.

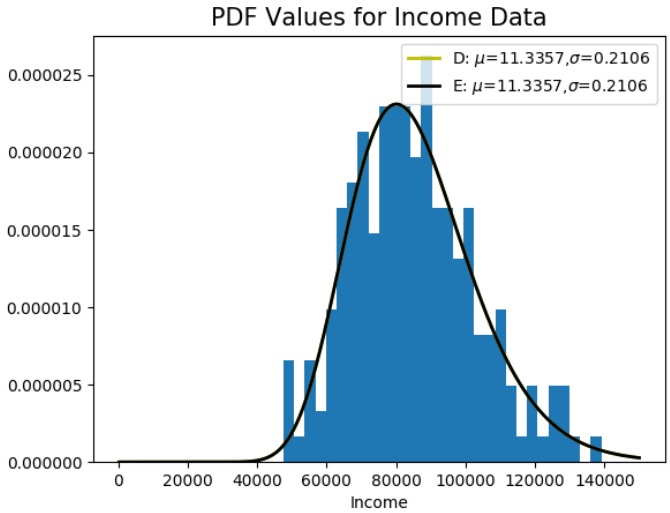


Part d: The value of the GMM criterion function is 2.50777239144e-11 at the estimated parameters mu = 11.3356813276 and sig = 0.210598453593.
The data moments are: 0.3, 0.5, and 0.2
The model moments are: 0.3000000033050266, 0.5000000061503356, and 0.19999999054463755
The data moments and the model moments are extremely similar, with the model moments coming very close to the exact values of the data moments.



Part e: The value of the GMM criterion function is 62.8729053077 at the estimated parameters mu = 11.3356813288 and sig = 0.210598455909.
The data moments are: 0.3, 0.5, and 0.2

The model moments are: 0.3000000032868257 0.5000000019480383 0.1999999947651358
The data moments and the model moments are again very similar, even close to the data moments than in part d.



Part f: I believe that the best model for this data is initial model generated in part b, the model generated using the moments mu and sigma and using the identity matrix. All of the models created are extremely similar and all graphs appear to be good fits for the data. Since the values of the model moments in parts B and C and parts D and E are only very slightly different and all graphs appear identical, I can only differentiate their goodness of fit using the value from the GMM criterion function. The model in part B has the lowest value derived from the GMM criterion function.

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Part a:

The GMM estimates:
$\beta 0 = 0.252200169501$
$\beta 1 = 0.0130222994523$
$\beta 2 = 0.399781749803$
$\beta 3 = -0.0100594927485$

The value of the GMM criterion function is 0.0148568243786.