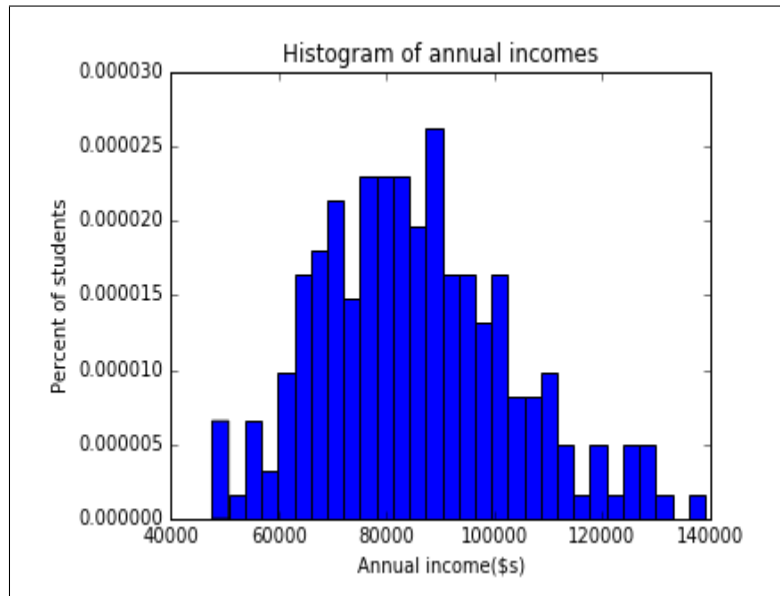


Problem Set #4

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Problem 1

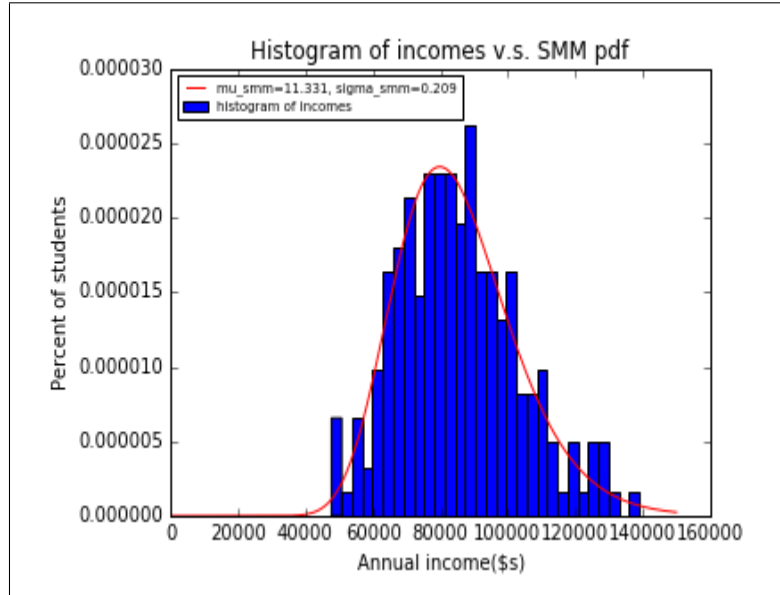
Part (a) The histogram of annual incomes is shown below.



Part (b)

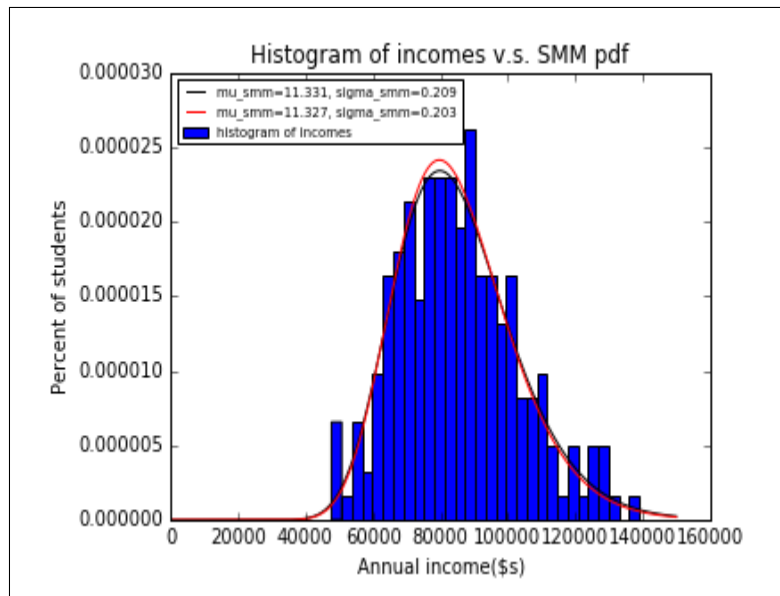
The (2,2) pdf values returned from LN_pdf function using the test inputs as specified in (b) is $\begin{bmatrix} 0.0019079 & 0.00123533 \\ 0.00217547 & 0.0019646 \end{bmatrix}$

Part (c) The graph for comparison between the SMM pdf and the histogram is shown below. The SMM estimates of μ and σ are $\mu_{smm}=11.3307149892$ and $\sigma_{smm}=$



0.208868329657. The value of the SMM criterion function at the estimated parameter values is $7.20176828929e-14$. The two data moments are: $\mu_{data} = 85276.8236063$, $\sigma_{data}^2 = 323731572.23$, and the model moments at the estimated parameter values are: $\mu_{model} = 85276.8464227$, $\sigma_{model}^2 = 323731565.513$. So we can see that the SMM pdf fits the histogram quite well.

Part (d) The graph for comparison between the two SMM pdfs and the histogram is shown below. The red line is the pdf using the optimal weighting matrix. The SMM



estimates of μ and σ using the optimal weighting matrix are $\mu_{smm}=11.3268995695$

and $\sigma_{smm} = 0.203138608003$, and the value of GMM criterion function at the estimated parameter values is $8.09375342214e-06$. The two data moments are: $\mu_{smm} = 85276.8236063$, $\sigma_{smm}^2 = 323731572.23$, and the two model moments at the estimated parameter values are: $\mu_{model} = 84849.112175$, $\sigma_{model}^2 = 302792705.205$. So we can see that the SMM estimates using the optimal weighting matrix do not perform as well as expected based on the histogram.