Problem Set #3

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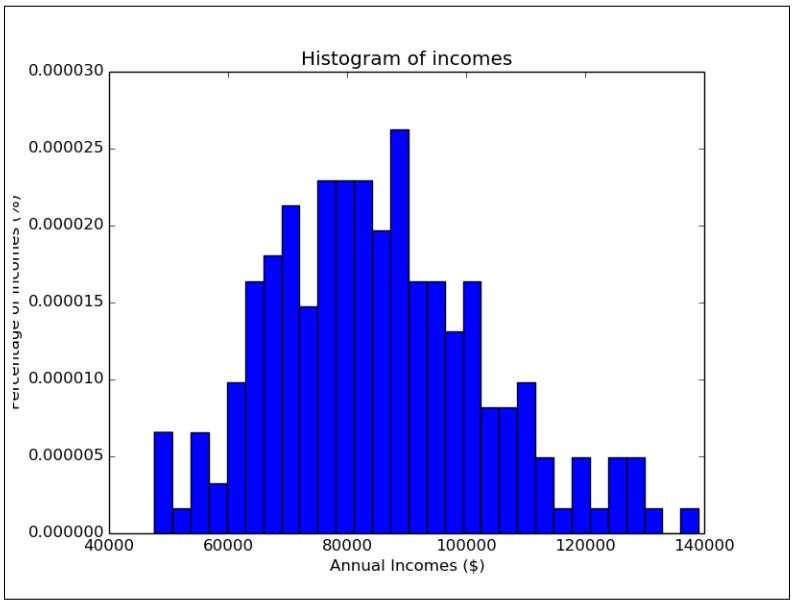
Problem 1 Part (a).

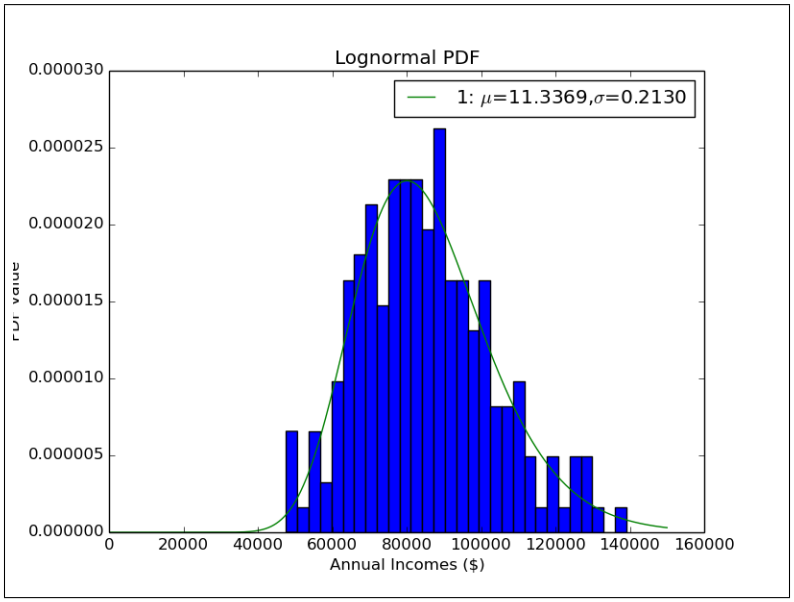
Figure 1: Histogram for Income



Part (b).

The log normal parameters are: mean: 11.3369099229, std:0.213027109558
The value of the criterion function is: 1.79430605e-13
Data moments are: mean: 85276.8236063 std: 17992.542128
Model moments are: mean: 85276.7903569504 std: 17992.5391492

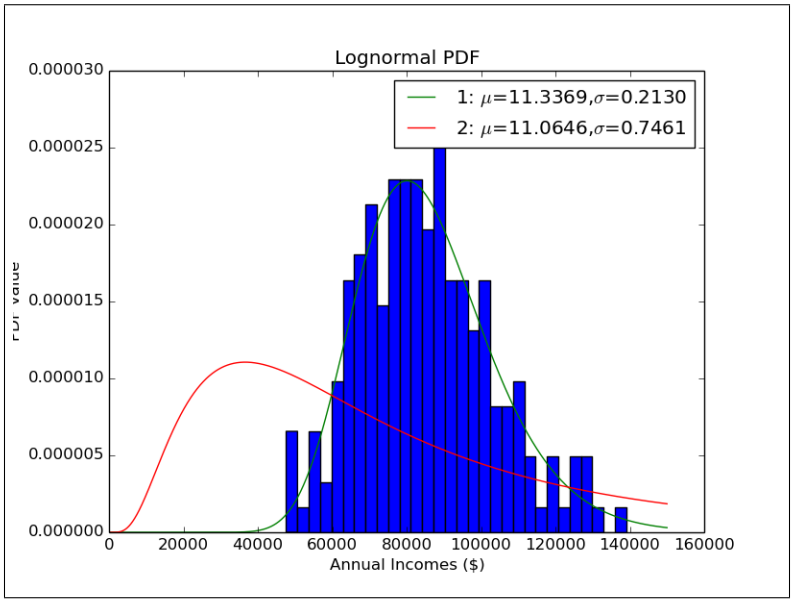
Figure 2: two moment condition



Part (c).

The log normal parameters are: mean:11.0646211007, std:0.746080276205
The value of the criterion function is: -0.03281297
Data moments are: mean: 85276.8236063 std: 17992.542128
Model moments are: mean: 55242.28362227154 std: 32916.416721

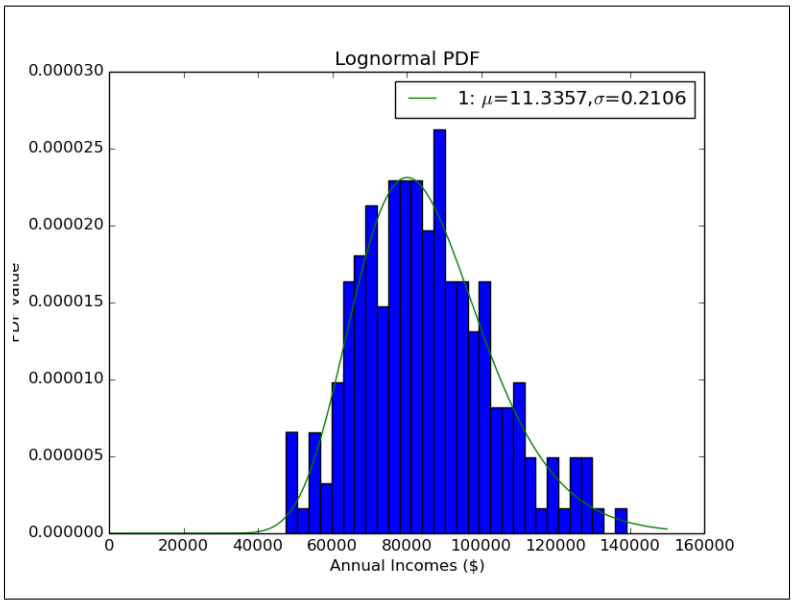
Figure 3: two-step



Part (d).

The value of the criterion function is: 2.53478537e-11
Data moment:
The proportion of students who earn less than $75000 is: 0.3
The proportion of students whose income is between $75000 and $100000 is: 0.5
The proportion of students who earn more than $100000 is: 0.2
Model Moment:
The proportion of students who earn less than $75000 is: 0.3000000036326135
The proportion of students whose income is between $75000 and $100000 is: 0.5000000058562853
The proportion of students who earn more than $100000 is: 0.1999999905111009
The graph is shown below:

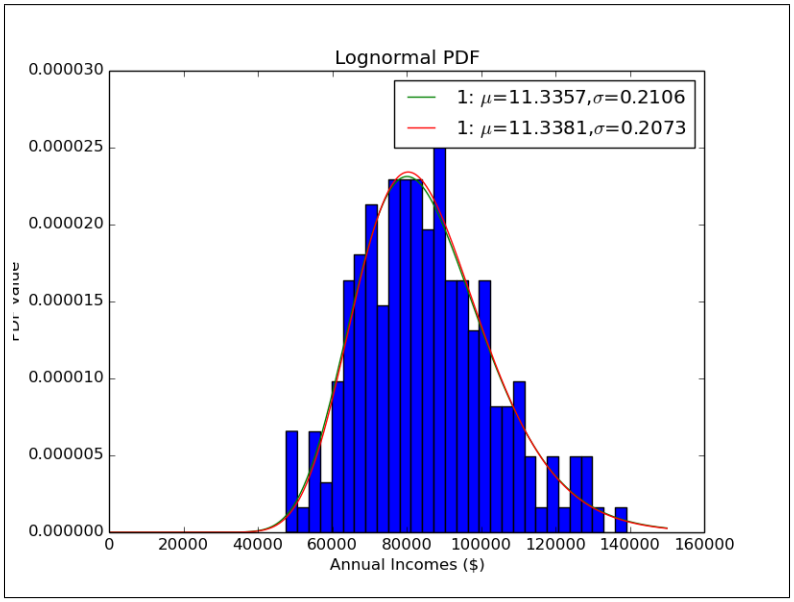
Figure 4: different moments



Part (e).

The value of the criterion function is: 102.51189532
Data moment:
The proportion of students who earn less than $75000 is: 0.3
The proportion of students whose income is between $75000 and $100000 is: 0.5
The proportion of students who earn more than $100000 is: 0.2
Model Moment:
The proportion of students who earn less than $75000 is: 0.29309956707115864
The proportion of students whose income is between $75000 and $100000 is: 0.5073488253220612
The proportion of students who earn more than $100000 is: 0.1995516076067799
The graph is shown below:

Figure 5: three-step



Problem 2 Part (a).
The value of the criterion function is: 10.8342173393

$$\beta_0 = -19.3701404677$$

$$\beta_1 = -30.769609307$$

$$\beta_2 = 0.771823148029$$

$$\beta_3 = 76.937826047$$