Problem Set #4
MACS 30000, Dr. Evans
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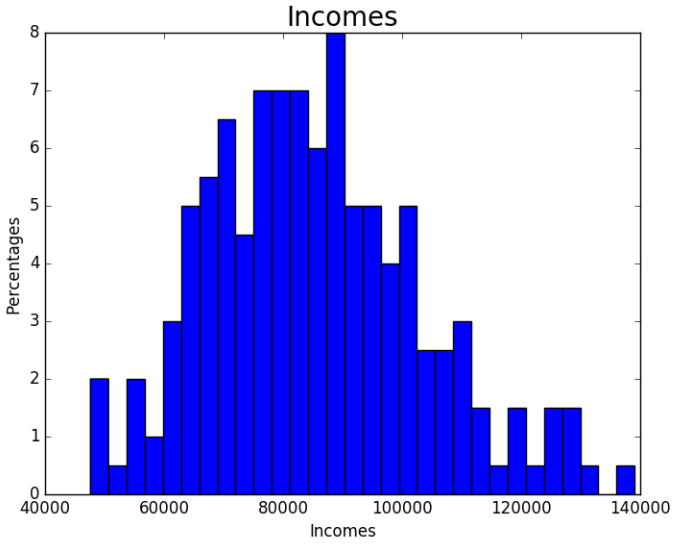
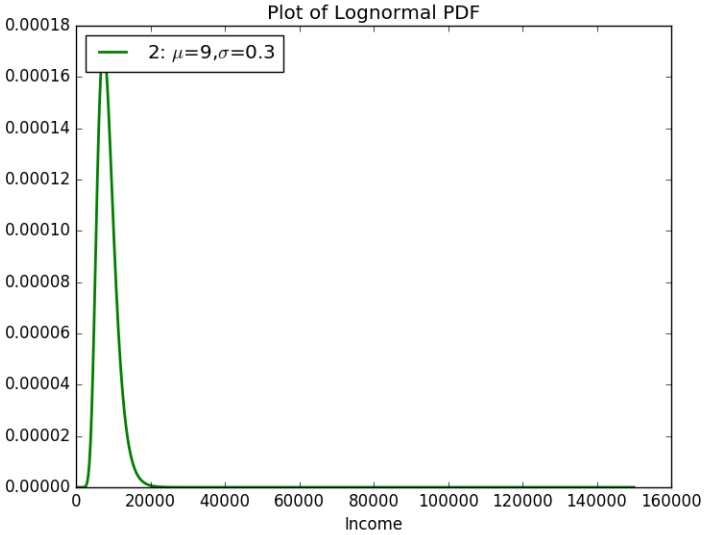
1 Question 1

Part A

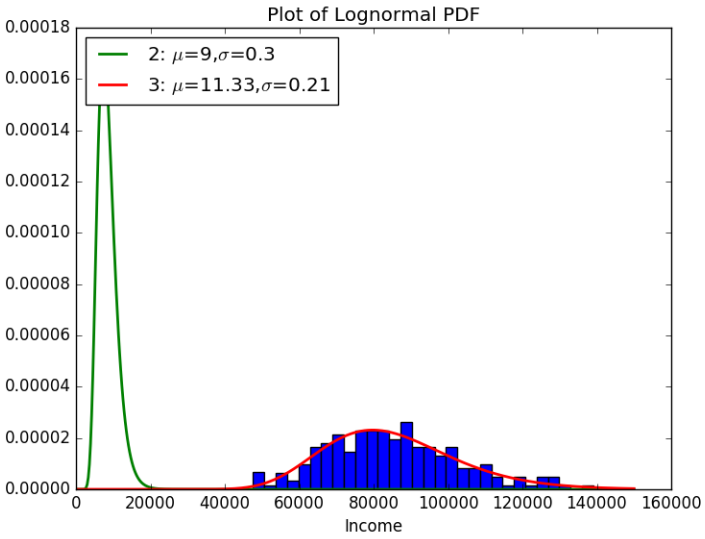


Part B



The value of the log likelihood function is -8298.63695601

Part C



Mu = 11.331
Sigma = 0.212
Variance-Covariance matrix:

$$\begin{bmatrix} 0.00030666 & 0.00015309 \\ 0.00015309 & 0.0002455 \end{bmatrix}$$

Part D

Chi squared of H0 with 2 degrees of freedom p-value = 0.0.
This means that it is unlikely that the income data came from this distribution.

Part E

Percentage of students that will earn more than 100,000$: 19.58%
Percentage of student that will earn less than 75, 000$: 30.77%

2 Question 1

Part A

$$\beta_0 = 0.252 \beta_1 = 0.013 \beta_2 = 0.400 \beta_3 = -0.010 \sigma = 0.0518140029396$$

The value of the log likelihood function is 407.892
Variance-Covariance matrix:

$$\begin{bmatrix} 1. & 0. & 0. & 0. & 0. \\ 0. & 1. & 0. & 0. & 0. \\ 0. & 0. & 1. & 0. & 0. \\ 0. & 0. & 0. & 1. & 0. \\ 0. & 0. & 0. & 0. & 1. \end{bmatrix}$$

Chi squared of H0 with 2 degrees of freedom p-value = 0.0.

This means that it is unlikely that age, number of children, and average winter temperature have no effect on sick days.