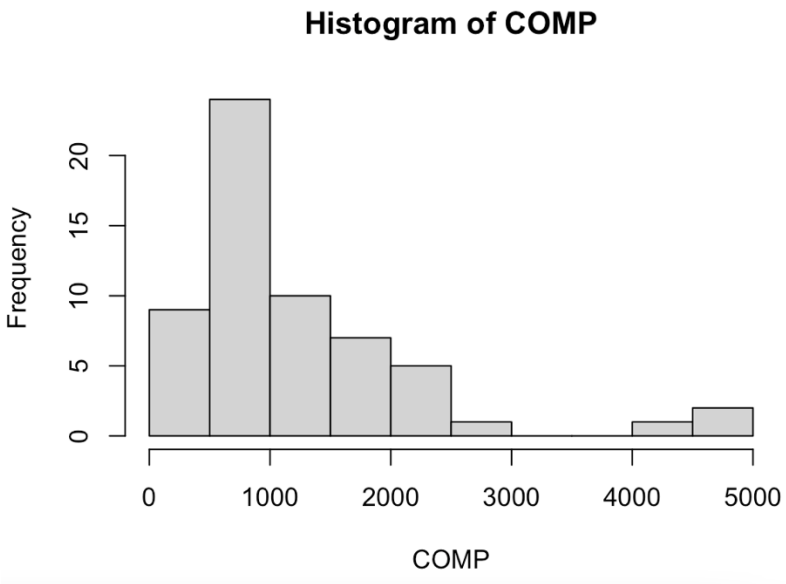
2) a) By observing the histogram of CEO compensation, we find that the histogram is skewed to the right. Thus, we suspect that a log transformation may be suitable

```
# 2)
# a)
hist(COMP)
```



b) By observing the output from R-code summary(ceocomplm), which represents the original model, and summary(refitm), which represents the transformed model, we find that the R-squared value decreases from 0.4883 to 0.485. To be specific, the R-squared value of the original model is 0.4883. This represents that approximately 48.83% of the variation of CEO compensation can be explained by the original model variables, including CEO's age, CEO's education level, background type, number of years employed by the firm, number of years as the firm CEO, sales revenues, market value of the CEO's stock, percentage of firm's market value owned by the CEO, profits of the firm before taxes. On the contrary, the R-squared value of the transformed model is 0.485. This represents that approximately 48.5% of the variation of log transformation of CEO compensation can be explained by the transformed model variables, including CEO's age, CEO's education level, background type, number of years employed by the firm, number of years as the firm CEO, sales revenues, market value of the CEO's stock, percentage of firm's market value owned by the CEO, profits of the firm before taxes.

For individual parameter estimators, we should observe each p-value and get the answer. We firstly consider the original model. Because the p-values of PCNTOWN, PROF are smaller than 0.05. After accounting for the other variables in the model, the percentage of firm's market value owned by the CEO and profits of the firm before taxes are significantly related to CEO compensation. Other variables, including CEO's age, CEO's education level, background type, number of years employed by the firm, number of years as the firm CEO, sales revenues, market value of the CEO's stock, are not significantly related to CEO compensation after accounting for other variables in the model since their p-values are larger than 0.05 based on the R code output.

Then we consider the transformed model. Because the p-value of PCNTOWN is smaller than 0.05, after

accounting for the other variables in the model, the percentage of firm's market value owned by the CEO is significantly related to the log transformation of CEO compensation. Other variables, including profits of the firm before taxes, CEO's age, CEO's education level, background type, number of years employed by the firm, number of years as the firm CEO, sales revenues, market value of the CEO's stock, are not significantly related to the log transformation of CEO compensation after accounting for other variables in the model since their p-values are larger than 0.05 based on the R code output.

Thus, we find that the percentage of firm's market value owned by the CEO and profits of the firm before taxes are significantly related to CEO compensation in the original model after accounting for other variables. We also find that the percentage of firm's market value owned by the CEO is significantly related to the log transformation of CEO compensation in the transformed model after accounting for other variables. Thus, after accounting for other variables, the profits of the firm before taxes is significantly related to CEO compensation in the original model but it is not significantly related to the log transformation of CEO compensation in the transformed model. Also, after accounting for other variables, we find that the percentage of firm's market value owned by the CEO is significantly related to CEO compensation in the original model and it is also significantly related to the log transformation of CEO compensation in the transformed model. Other variables, including CEO's age, CEO's education level, background type, number of years employed by the firm, number of years as the firm CEO, sales revenues, market value of the CEO's stock, are not significantly related to CEO compensation after accounting for other variables in the original model and they are not significantly related to the log transformation of CEO compensation after accounting for other variables in the transformed model.

```
# b)
summary(ceocomplm)
refitm <- lm(log(COMP) ~ AGE+EDUCATN+bg+TENURE+EXPER+SALES+VAL+PCNTOWN+PROF)
summary(refitm)
```

```
Call:
lm(formula = COMP ~ AGE + EDUCATN + bg + TENURE + EXPER + SALES +
    VAL + PCNTOWN + PROF)

Residuals:
    Min      1Q  Median      3Q     Max
-981.54 -369.49  -77.39  216.41 3096.71

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.573e+03  1.350e+03   1.905   0.0630 .
AGE         -2.576e+01  2.032e+01  -1.268   0.2113
EDUCATN     -4.557e+02  2.411e+02  -1.890   0.0650 .
bg2         -2.030e+02  3.475e+02  -0.584   0.5620
bg3          4.760e+02  3.330e+02   1.430   0.1596
bg4         -1.263e+02  3.731e+02  -0.338   0.7366
bg5          3.106e+01  3.271e+02   0.095   0.9248
TENURE       1.273e+01  1.197e+01   1.063   0.2932
EXPER        2.438e+01  1.552e+01   1.571   0.1231
SALES        6.334e-03  2.650e-02   0.239   0.8122
VAL          1.077e+00  8.382e-01   1.285   0.2053
PCNTOWN     -7.612e+01  3.707e+01  -2.054   0.0457 *
PROF         1.080e+00  5.009e-01   2.156   0.0364 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 767.4 on 46 degrees of freedom
Multiple R-squared:  0.4883,    Adjusted R-squared:  0.3548
F-statistic: 3.658 on 12 and 46 DF,  p-value: 0.0006972
```

```
Call:
lm(formula = log(COMP) ~ AGE + EDUCATN + bg + TENURE + EXPER +
    SALES + VAL + PCNTOWN + PROF)

Residuals:
     Min       1Q   Median       3Q      Max
-0.86549 -0.33712 -0.00223  0.25650  1.50043

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  6.835e+00  9.167e-01   7.456 1.89e-09 ***
AGE         -5.355e-03  1.380e-02  -0.388  0.69966
EDUCATN     -2.007e-01  1.637e-01  -1.226  0.22646
bg2          2.536e-02  2.359e-01   0.107  0.91488
bg3          2.883e-01  2.261e-01   1.275  0.20867
bg4         -8.711e-02  2.533e-01  -0.344  0.73250
bg5          1.660e-01  2.221e-01   0.747  0.45867
TENURE       1.274e-02  8.130e-03   1.567  0.12402
EXPER        1.420e-02  1.054e-02   1.348  0.18433
SALES        1.289e-05  1.799e-05   0.716  0.47742
VAL          1.106e-03  5.691e-04   1.943  0.05810 .
PCNTOWN     -6.839e-02  2.517e-02  -2.718  0.00924 **
PROF         4.265e-04  3.401e-04   1.254  0.21612
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5211 on 46 degrees of freedom
Multiple R-squared:  0.485,     Adjusted R-squared:  0.3507
F-statistic: 3.611 on 12 and 46 DF,  p-value: 0.0007829
```