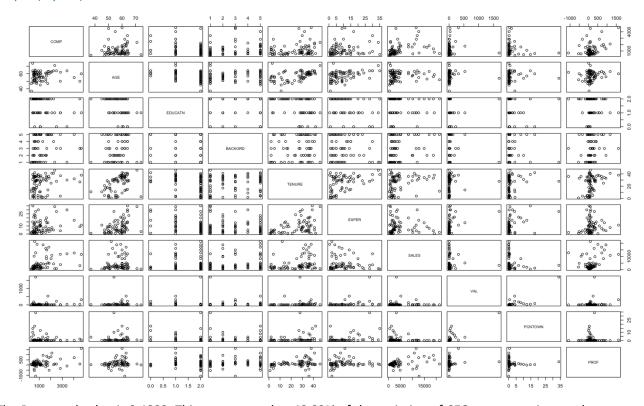Question 2

a)   The relationship between compensation and age is linear.

```
# Question 2
setwd("~/Desktop/STAT 371/a2")
ceocomp=read.table("ceocomp.txt",header = TRUE)
attach(ceocomp)
set.seed(20884580)
my.dat = ceocomp[sample(nrow(ceocomp),75),]

# a)
plot(my.dat)
```


b)   The R-squared value is 0.4883. This represents that 48.83% of the variation of CEO compensation can be explained by the 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. 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.

```
# b)
positive <- subset(my.dat, PROF > 0)
attach(positive)
bg <- as.factor(BACKGRD)
ceocomplm <- lm(COMP ~ AGE+EDUCATN+bg+TENURE+EXPER+SALES+VAL+PCNTOWN+PROF)
summary(ceocomplm)
```

```
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
```