ECON HW 4

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```r
library(haven)

data <- read_dta('C:/Users/Nick/Downloads/WAGE1.DTA')
data

## # A tibble: 526 x 24



#1.1

lm.fit <- lm( log(data$wage) ~ data$educ + data$exper + (data$expersq))
lm.fit

##
## Call:
## lm(formula = log(data$wage) ~ data$educ + data$exper + (data$expersq))
##
## Coefficients:
##  (Intercept)     data$educ    data$exper  data$expersq
##    0.1279975     0.0903658     0.0410089    -0.0007136

summary(lm.fit)

##
## Call:
## lm(formula = log(data$wage) ~ data$educ + data$exper + (data$expersq))
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.96387 -0.29375 -0.04009  0.29497  1.30216
##
## Coefficients:
##                Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.1279975  0.1059323   1.208    0.227
## data$educ     0.0903658  0.0074680  12.100  < 2e-16 ***
## data$exper    0.0410089  0.0051965   7.892 1.77e-14 ***
## data$expersq -0.0007136  0.0001158  -6.164 1.42e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4459 on 522 degrees of freedom
```

```
## Multiple R-squared:  0.3003, Adjusted R-squared:  0.2963
## F-statistic: 74.67 on 3 and 522 DF,  p-value: < 2.2e-16
```

```
#1.2
```

```
lm.fit.reduced <- lm( log(data$wage) ~ data$educ + data$exper )
anova( lm.fit , lm.fit.reduced)
```

```
## Analysis of Variance Table
##
## Model 1: log(data$wage) ~ data$educ + data$exper + (data$expersq)
## Model 2: log(data$wage) ~ data$educ + data$exper
##   Res.Df    RSS Df Sum of Sq      F    Pr(>F)
## 1    522 103.79
## 2    523 111.34 -1   -7.5543 37.993 1.421e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
# Exp^2 is statistically significant with a p-value of 1.421 * 10^-9
```

```
#1.3
```

```
tenth = lm.fit$coefficients[3]*10 + lm.fit$coefficients[4]*(10^2)
sprintf( "tenth year effect is %f", tenth)
```

```
## [1] "tenth year effect is 0.338733"
```

```
twentyth = lm.fit$coefficients[3]*20 + lm.fit$coefficients[4]*(20^2)
sprintf( "twentyth year effect is %f", twentyth)
```

```
## [1] "twentyth year effect is 0.534754"
```

```
thirthyth = lm.fit$coefficients[3]*30 + lm.fit$coefficients[4]*(30^2)
sprintf( "thirtyth year effect is %f", thirthyth)
```

```
## [1] "thirtyth year effect is 0.588064"
```

```
#1.4
```

```
y = ('lm.fit$coefficients[3]*x + lm.fit$coefficients[4]*(x^2)')
```

```r
zero = -lm.fit$coefficients[3]/lm.fit$coefficients[4]
zero
```

```
## data$exper
##   57.47096
```

```r
lm.fit$coefficients[3]*zero + lm.fit$coefficients[4]*(zero^2)
```

```
## data$exper
##          0
```

```r
sprintf("%f years of experience until zero effect. Zero people have this much work experience.", zero)
```

```
## [1] "57.470964 years of experience until zero effect. Zero people have this much work experience."
```

```r
#data$exper
```