

STAT 217: Class handout 10/31

The following is output from a linear model of log earnings on education. I will use this output for the class example today. You can use this handout to follow along. You can fill in the blanks here or in your notes.

```
##
## Call:
## lm(formula = log.earn ~ ed, data = earn)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.722 -0.320  0.106  0.565  2.052
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   8.0595     0.1433   56.2   <2e-16
## ed            0.1225     0.0104   11.7   <2e-16
##
## Residual standard error: 0.872 on 1190 degrees of freedom
## Multiple R-squared:  0.104, Adjusted R-squared:  0.103
## F-statistic: 138 on 1 and 1190 DF,  p-value: <2e-16
##              2.5 % 97.5 %
## (Intercept)  7.778  8.341
## ed           0.102  0.143
```

Conclusion for a test for a slope coefficient when the response variable is logged:

```
##
## Call:
## lm(formula = earn ~ log.ed, data = earn)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -31673 -10527  -3939   6968 167327
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)    -57440      7035    -8.16  8.2e-16
## log.ed         31177      2714    11.49  < 2e-16
##
## Residual standard error: 18500 on 1190 degrees of freedom
## Multiple R-squared:  0.0998, Adjusted R-squared:  0.0991
## F-statistic: 132 on 1 and 1190 DF,  p-value: <2e-16
##           2.5 % 97.5 %
## (Intercept) -71243 -43636
## log.ed       25853  36501
```

Conclusion for a test for a slope coefficient when the explanatory variable is logged:

```
##
## Call:
## lm(formula = log.earn ~ log.ed, data = earn)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -4.695 -0.355  0.114  0.561  2.080
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.873     0.332    17.7   <2e-16
## log.ed         1.486     0.128    11.6   <2e-16
##
## Residual standard error: 0.873 on 1190 degrees of freedom
## Multiple R-squared:  0.101, Adjusted R-squared:  0.101
## F-statistic: 134 on 1 and 1190 DF,  p-value: <2e-16
##           2.5 % 97.5 %
## (Intercept)  5.22   6.52
## log.ed       1.23   1.74
```

Conclusion for a test for a slope coefficient when both the explanatory and response variables are logged: