wooldRidge-vignette

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Effect of Job Training on Firm Scrap Rates

One approach to learning is to find an example from your textbook, and then recreate it.

From example 4.7 of the text:

> "The scrap rate for a manufacturing firm is the number of defective items - products that must be discarded - out of every 100 produced. Thus, for a given number of items produced, a decrease in the scrap rate reflects higher worker productivity."
>
> "We can use the scrap rate to measure the effect of worker training on productivity. Using the data in jtrain, but only for the year 1987 and for nonunionized firms, we obtain the following estimated equation:"

First, load the wooldRidge package and `jtrain` data set.

```
library(wooldRidge)
data("jtrain")
```

Next, create an index identifying which observations occur in 1987 and are non-union.

```
index <- jtrain$year == 1987 & jtrain$union == 0
```

Next, subset the jtrain data by the new index. This returns a data.frame of `jtrain` data of non-union firms for the year 1987.

```
jtrain_1987_nonunion <- jtrain[index,]
```

Now create the linear model regressing hrsemp(total hours training/total employees trained), the log of annual sales, and the log of the number of the employees, against the log of the scrape rate.

$$lscrap = \alpha + \beta_1 hrsemp + \beta_2 lsales + \beta_3 lemploy$$

```
linear_model <- lm(lscrap ~ hrsemp + lsales + lemploy, data = jtrain_1987_nonunion)
```

Finally, print the `coefficients` of the model as well as its R^2.

```
linear_model$coefficients
```

```
## (Intercept)      hrsemp      lsales     lemploy
## 12.45837178 -0.02926893 -0.96202693  0.76147045
```

```
summary(linear_model)$r.squared
```

```
## [1] 0.2624307
```