Highway Exmaple #3: Bigger Data (For Illustration)

This example is for illustration. We return to the highway data once more, but this time we "pretend"" the sample size is four times the original sample size. We want to mimic a data set that has the same properties as the highway data, but is bigger.

```
library(MuMIn)
highway <- read.csv("C:/hess/STAT512/RNotes/MultReg3/MR3_Highway.csv")
nrow(highway)
```

```
## [1] 39
```

```
highway <- highway[,-1]
Model1 <- lm(rate ~ acpt + len + slim + sigs + pa, data = highway)
summary(Model1)
```

```
##
## Call:
## lm(formula = rate ~ acpt + len + slim + sigs + pa, data = highway)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.93807 -0.80142 -0.00392  0.80743  2.44918
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  9.94408    2.58209   3.851 0.000512 ***
## acpt         0.06428    0.03026   2.124 0.041256 *
## len         -0.07405    0.02451  -3.021 0.004840 **
## slim        -0.10510    0.04132  -2.543 0.015851 *
## sigs         0.79736    0.36868   2.163 0.037907 *
## pa          -0.77443    0.41067  -1.886 0.068156 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.076 on 33 degrees of freedom
## Multiple R-squared:  0.745,  Adjusted R-squared:  0.7064
## F-statistic: 19.29 on 5 and 33 DF,  p-value: 5.996e-09
```

```
BigHighway <- rbind(highway, highway, highway, highway)
nrow(BigHighway)
```

```
## [1] 156
```

```
rm(highway)
Model2 <- lm(rate ~ acpt + len + slim + sigs + pa, data = BigHighway)
summary(Model2)
```

```
##
## Call:
## lm(formula = rate ~ acpt + len + slim + sigs + pa, data = BigHighway)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.93807 -0.81548 -0.00392  0.85818  2.44918
```

```
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  9.94408    1.21111   8.211 9.36e-14 ***
## acpt         0.06428    0.01419   4.528 1.20e-05 ***
## len         -0.07405    0.01150  -6.441 1.52e-09 ***
## slim        -0.10510    0.01938  -5.422 2.30e-07 ***
## sigs         0.79736    0.17293   4.611 8.52e-06 ***
## pa          -0.77443    0.19262  -4.020 9.17e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.009 on 150 degrees of freedom
## Multiple R-squared:  0.745,  Adjusted R-squared:  0.7365
## F-statistic: 87.66 on 5 and 150 DF,  p-value: < 2.2e-16
```

```
FullModel <- lm(rate ~ . , data = BigHighway)
options(na.action = "na.fail")
AllSubsets <- dredge(FullModel, rank = "AIC")
```

```
## Fixed term is "(Intercept)"
```

```
head(AllSubsets)
```

```
## Global model call: lm(formula = rate ~ ., data = BigHighway)
## ---
## Model selection table
##      (Intrc)    acpt       adt    itg      len    lwid      ma      pa
## 7586   11.37 0.06963                  -0.05861         -0.4698 -0.9859
## 7458   10.57 0.06277                  -0.06345                 -0.7432
## 7594   11.73 0.06716           -0.285 -0.06185         -0.6693 -1.1810
## 7650   13.30 0.07100                  -0.06105 -0.1629 -0.5076 -0.9715
## 7588   11.64 0.06786 -0.004514        -0.06075         -0.6138 -1.1020
## 7970   11.24 0.06000                  -0.06145                 -0.8390
##         shld   sigs    slim     trks df   logLik   AIC delta weight
## 7586         0.6477 -0.1135 -0.09773  9 -216.286 450.6  0.00  0.261
## 7458         0.7013 -0.1031 -0.08852  8 -217.583 451.2  0.59  0.194
## 7594         0.6961 -0.1144 -0.09915 10 -215.727 451.5  0.88  0.168
## 7650         0.6281 -0.1120 -0.10080 10 -215.919 451.8  1.27  0.138
## 7588         0.6868 -0.1140 -0.09942 10 -215.997 452.0  1.42  0.128
## 7970 0.04161 0.7231 -0.1210 -0.08124  9 -217.138 452.3  1.70  0.111
## Models ranked by AIC(x)
```