Linear Regression Code

STAT 630, Fall 2021

```
library(MASS)
```

```
lm1 <- lm(MPG.highway ~ Weight, data = Cars93)
summary(lm1)
```

```
##
## Call:
## lm(formula = MPG.highway ~ Weight, data = Cars93)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -7.6501 -1.8359 -0.0774  1.8235 11.6172
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept) 51.6013654  1.7355498   29.73   <2e-16 ***
## Weight      -0.0073271  0.0005548  -13.21   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.139 on 91 degrees of freedom
## Multiple R-squared:  0.6572, Adjusted R-squared:  0.6534
## F-statistic: 174.4 on 1 and 91 DF,  p-value: < 2.2e-16
```

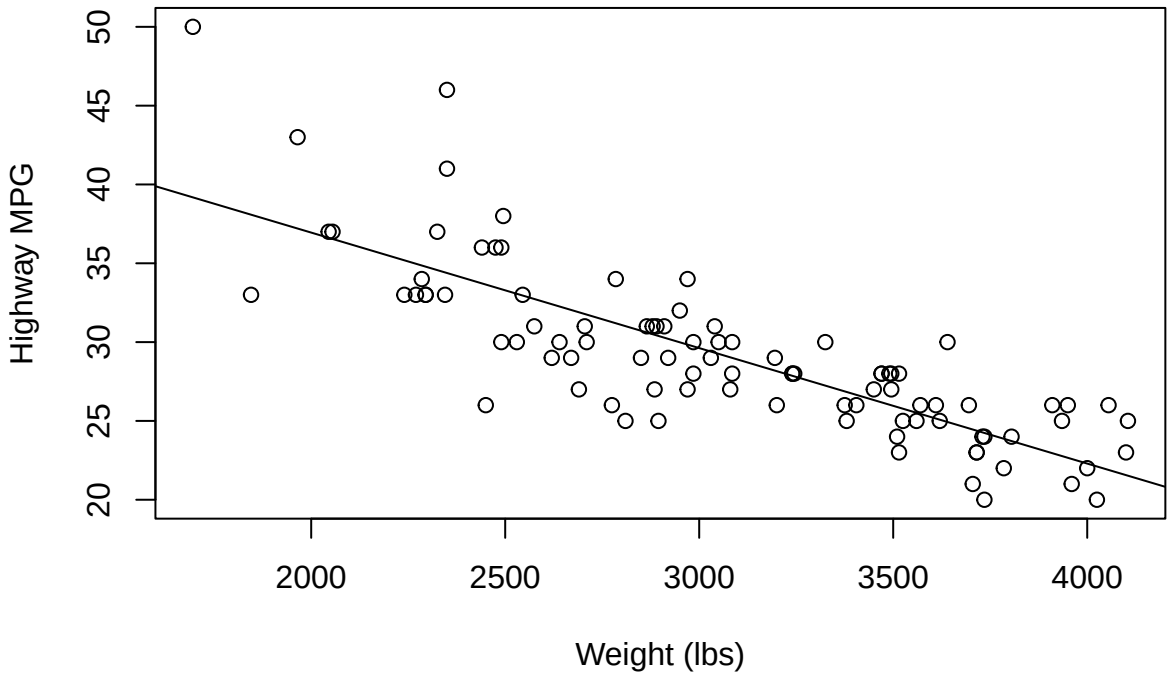
```
confint(lm1)
```

```
##                    2.5 %       97.5 %
## (Intercept) 48.153908989 55.048821869
## Weight      -0.008429042 -0.006225077
```

```
confint(lm1, level = 0.99)
```

```
##                    0.5 %       99.5 %
## (Intercept) 47.035237277 56.167493581
## Weight      -0.008786626 -0.005867492
```

```r
plot(Cars93$Weight, Cars93$MPG.highway,
     xlab = "Weight (lbs)",
     ylab = "Highway MPG")
abline(lm1) # add least squares line
```



```
library(ggplot2)
```

```
ggplot(data = Cars93, aes(x = Weight, y = MPG.highway)) +
  geom_point() +
  geom_smooth(method = "lm", se = FALSE) +
  labs(x = "Weight (lbs)", y = "Highway MPG")
```

```
## `geom_smooth()` using formula 'y ~ x'
```