Assignment #6

1. Interaction effects?

```r
# Prediction interval uses sample mean and takes into account the variability of the estimators for μ and σ.
# Therefore, the interval will be wider.

### Multiple linear regression
fit2=lm(medv~lstat+age,data=Boston)
summary(fit2)
fit3=lm(medv~.,Boston)
summary(fit3)
par(mfrow=c(2,2))
plot(fit3,pch=20, cex=.8, col="steelblue")
mtext("fit3", side = 3, line = - 2, cex = 2, outer = TRUE)

# Update function to re-specify the model, i.e. include all but age and indus variables
fit4=update(fit3,~.-age-indus)
summary(fit4)

# Set the next plot configuration
par(mfrow=c(2,2), main="fit4")
plot(fit4,pch=20, cex=.8, col="steelblue")
mtext("fit4", side = 3, line = - 2, cex = 2, outer = TRUE)

# Uses coefplot to plot coefficients.  Note the line at 0.
par(mfrow=c(1,1))
arm::coefplot(fit4)
```

Interpreting interactive terms just means interpreting interaction effects between variables. This would require us to use a linear regression model. After creating our regression, we can interpret and examine coefficients in our regression. Some of that code might look like:

Create interaction plot

```
library(ggplot2)
ggplot(data, aes(x = x1, y = y, color = factor(x2))) +
  geom_point() +
  geom_smooth(method = "lm", se = FALSE) +
  labs(title = "Interaction Plot", x = "x1", y = "y", color = "x2")
```

*example code generated using ChatGPT

Here, we are using the package “ggplot2” to visualize the interaction effects of our coefficients.