```
# load the dataset into R
car_data <- read.csv(file.choose())
car_300 <- car_data[1:300,]
str(car_300)

#run simple linear regression
simple_model <- lm(mpg ~ weight, data = car_300)
summary(simple_model)

#run multiple linear regression
multiple_model <- lm(mpg ~ weight + cylinder + acceleration, data = car_300)
summary(multiple_model)

#predict mpg on new data- the last 98 records
car_98 <- car_data[301:398, ]
head(car_98)
predictions <- predict(multiple_model, newdata = car_98)
predictions

#actual mpg for last 98 records
actual_mpg <- car_98$mpg

#calculate residuals
residuals <- actual_mpg - predictions
residuals

#plot residuals vs predicted values
plot(predictions, residuals,
     xlab = "Predicted MPG",
     ylab = "Residuals",
     main = "Residual Plot for Multiple Linear Regression",
     pch = 16, col = "skyblue")
abline(h = 0, col = "darkblue", lwd = 2)

# Plot a histogram of the residuals
hist(residuals,
     main = "Histogram of Residuals",
     xlab = "Residuals",
     col = "violet",
     border = "orange",
     breaks = 15)
```