Kevin Inzunza

Group Assignment 1: Section 3.7, Problem 8

Output:

```
Call:
lm(formula = mpg ~ horsepower)

Residuals:
     Min       1Q   Median       3Q      Max
 -13.5710  -3.2592  -0.3435   2.7630  16.9240

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 39.935861   0.717499   55.66   <2e-16 ***
horsepower  -0.157845   0.006446  -24.49   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.906 on 390 degrees of freedom
Multiple R-squared:  0.6059,     Adjusted R-squared:  0.6049
F-statistic: 599.7 on 1 and 390 DF,  p-value: < 2.2e-16
```
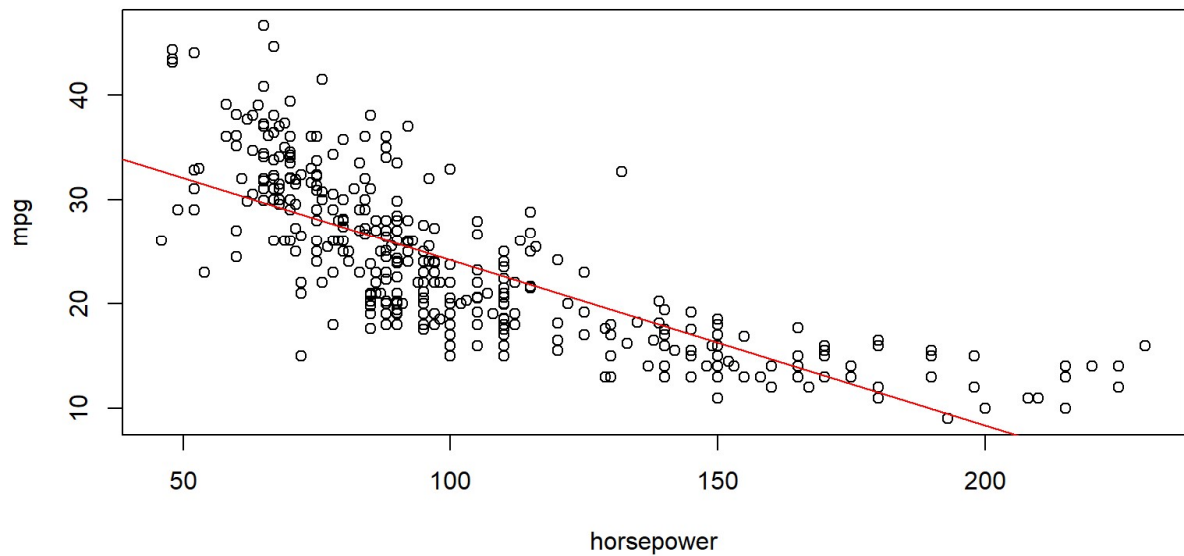
Questions:

a.

1. Yes, there is a strong relationship between the predictor and the response. The P-Value for horsepower and intercept (2e^-16) is less than the significance level (0.05).
2. The P- Value is < 0.05, which means it fits the data well. There for we can say the data has strong relationship between the predictor and response variables also because its and R squared value is 0.60.
3. The relationship between the predictor and response is negative because the beta value for horsepower is negative.
4. The predicted mpg is 24.46 with the horsepower at 98. The confidence interval (23.97308, 24.96108). The predicted interval (14.8094, 34.12476).

```
> predict(lm.fit,data.frame(horsepower = 98),interval = "confidence" )
       fit      lwr      upr
1 24.46708 23.97308 24.96108
> predict(lm.fit,data.frame(horsepower = 98),interval = "prediction" )
       fit     lwr      upr
1 24.46708 14.8094 34.12476
```

b.

c. The Residuals doesn't not show a horizontal line, it first starts acting like a slope doing down and curves up therefor it shows that the relationship is non-linear.