STA 207 HW-4
Due Date: Oct. 10 by 10:20AM in Moodle

Problem 1: (50 points)

For the textbook prices question in HW 3 you analyzed the data TextPrices. Continue the previous analysis by answering the following questions:

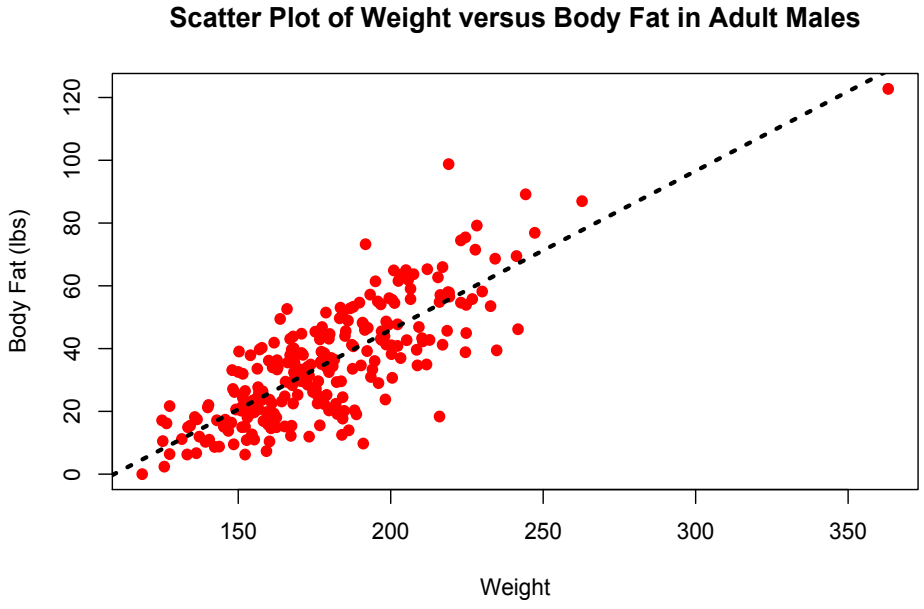
1. [5 points] Perform a hypothesis test to address the students' question of whether the number of pages is a useful predictor of a textbook's price. Report all steps (the hypotheses, level of significance, test statistic, and p-value, along with your conclusion within the context.)

2. [15 points] Determine a 95% confidence interval (CI) for the population slope coefficient. Interpret the CI in the context of the data. Determine a 90% CI for the population slope coefficient. Interpret the CI in the context of the data. What happened when we reduced the confidence level from 95% to 90%?

3. [30 points] For the model you fitted in homework-3, test the LINE conditions. Report all steps and discuss findings.

Problem 2: (50 points)

Using a sample of 252 adult males, a study would like to establish if there is a linear relationship between a man's percent body fat and his weight based on a simple linear regression. The regression model R-output is given below. The scatter plot of total body fat and weight along with the fitted linear regression line is shown in the Figure below.



R-output

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) _______     4.3161  -12.83   0.00001 ***
X             0.5066     _____   21.28   0.00001 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
Residual standard error: 11.08 on 250 degrees of freedom
Multiple R-squared:  0.6443,    Adjusted R-squared:  0.6429
F-statistic: 452.9 on 1 and 250 DF,  p-value: < 2.2e-16
```

Using the R-output and scatterplot answer the following questions:

(a) Report the fitted regression model (equation).

(b) Find the correlation between the weight and percent body fat of adult males (justify both magnitude and direction). Interpret the correlation.

(c) Report the standard error in slope estimate and interpret it.

(d) Report the standard error of residuals and interpret it.

(e) Report the coefficient of determination (R^2) and interpret it.

(f) It is hypothesized that weight is a significant predictor for the body fat. Use the given output to find out if this true or not. (show all steps: hypotheses, level of significance, test statistic, P-value and conclusion in context of the problem).