Stat 6021: Guided Question Set 1

The data for this question is saved as "bp.txt". The data set contains information on the weight (in pounds) and systolic blood pressure (in millimeters of mercury, mmHg) of 26 randomly selected males in the age group 25-30.

1. Create a scatterplot for this data set. Be sure to label the axes and give an appropriate title. Based on the appearance of the plot, does a simple linear regression appear reasonable for the data?

2. Perform a simple linear regression for systolic blood pressure against weight. Record the estimated equation for the linear regression, and state the estimated values of the slope and intercept. Interpret the values of the estimated slope and intercept, in context.

3. For a 30-year-old male whose weight is 200, what is his predicted systolic blood pressure? What is his residual?

4. Produce the ANOVA table for this linear regression.

5. What is the value of R^2? Explain how this value is found. What does this value mean in this context?

6. What is the estimated value for the standard deviation of the error terms for this regression model, $\hat{\sigma}$?

7. What are the null and alternative hypotheses for the ANOVA F test?

8. Explain how the F statistic of 35.744 is found.

9. Write an appropriate conclusion for the ANOVA F test for this simple linear regression model.