Stat 104 – Homework 4
Due Thursday September 26, 2013

Reading:  
September 10 – September 19  Chapter 3
September 24 – October 1  Chapter 4

Assignment:
1. Complete the following problems from the text: 3.27, 3.33, and 3.47.

3.27 Rating restaurants

a. 

b. 

c. 

d. 

3.33 Regression between cereal sodium and sugar

a. 

b. 

3.47 Murder and education

a. 

b. 

c. 

d. 
2. Problem 3 on Homework 3 looked at a random sample of 12 bottles of Bordeaux wine selected from the 2008 vintage. The Price ($), \( x \), and Rating, \( y \), of the wines in the sample are listed in Homework 3. Below are summaries and a plot of the data.

\[
\bar{x} = 47.00, \quad s_x = 42.857, \\
\bar{y} = 88.75, \quad s_y = 1.6026, \quad r = 0.7796
\]

![Data Plot]

a) Compute the estimate of the slope for the least squares regression line. Round final answer to 5 decimal places.

b) Give an interpretation of the estimated slope within the context of the problem.

c) Compute the estimate of the intercept for the least squares regression line. Round final answer to 2 decimal places.
d) Give the equation of the least squares regression line. Use this equation to predict the Rating for Chateau de Goelane that costs $15. Report your prediction to 2 decimal places. The Rating for Chateau de Goelane is 87, what is the residual?

e) Plot the least squares regression line on your plot of the data. It must be clear that you have used the least squares regression equation to plot the line.

f) Below is the plot of residuals versus the Price ($). Describe the plot. What does it tell you about the linear relationship between Price ($) and Rating?
3. Problem 4 of Homework 3 looked at data on the death rate (number of deaths per 100,000 people) from colon cancer for 30 nations. That data set also contained the fat intake (grams per day *per capita*) for the 30 nations. We wish to examine the relationship between fat intake, \( x \), and death rate, \( y \). The data are available on Blackboard Learn.

Use Analyze – Fit Y by X to construct a scatter plot of death rate, \( y \), versus fat intake, \( x \). From the red triangle pull down menu next to Bivariate Fit select Fit Line to have JMP compute the least squares regression equation relating fat intake to death rate. From the red triangle pull down menu next to Linear Fit select Plot Residuals to have JMP construct a plot of residuals versus predicted death rates. Using the JMP output:

a) Describe the scatter plot of death rate versus fat intake.

b) Give the regression equation for predicting death rate from fat intake.

c) Give an interpretation, within the context of the data, of the estimated slope.

d) Give the value of \( R^2 \) and an interpretation of this value.

e) Describe the plot of Death Rate Residual versus Death Rate Predicted and indicate what it tells you about the fit of the least squares regression line.

Be sure to attach the JMP output to your assignment.