Name:

Stat 217, Fall 2015

Quiz #6 October 26, 2015. 20 points.

Read all directions and show work. Little to no work will receive little to no credit.

1. You are working with data collected on the Lemon Glacier in Alaska between 1953 and 2005. The mass balance (MB) of a glacier is measure of the change from one year to the next in the glacier, with the units of measurement of the MB in meters of water equivalent (or m we) that is gained or lost over the year. It is of interest as way to assess the difference between precipitation and the melting that occurs in a glacier, with the long term trend providing information about the future of the glacier. A simple liner regression model was fit, and the output is shown below.

> RegModel.1 <- lm(mb~Year, data=LemonG)

> summary(RegModel.1)

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 25.792681 10.826671 2.382 0.0210

Year -0.013270 0.005471 -2.426 0.0189

Residual standard error: 0.6092 on 51 degrees of freedom

Multiple R-squared: 0.1034, Adjusted R-squared: 0.08585

F-statistic: 5.884 on 1 and 51 DF, p-value: 0.01886

> confint(RegModel.1)

2.5 % 97.5 %

(Intercept) 4.139339 47.446023

Year -0.024212 -0.002328

1. Which of the following would be the most appropriate correlation coefficient for the scatterplot above? (2 pts)
2. 0.85
3. -0.99
4. -0.01
5. -0.65
6. 0.03
7. What is the estimated regression equation? (3 pts)
8. What proportion of variability in mass balance is explained by the year? (2 pts)
9. 0.6092
10. 5.884%
11. 0.1034
12. 0.01886
13. Interpret the slope coefficient for year in the context of the problem. (2 pts)
14. For year 0, it is the average mass balance expected for a glacier.
15. It is the amount by which a glacier’s mass balance will decrease for each additional year.
16. It is the average amount by which we would expect a glacier’s mass balance to decrease for each additional year.

1. Predict the mass balance for a glacier in 1984. (2 pts)
2. -1.5
3. -0.59
4. -0.002
5. 0
6. 0.4
7. Can we use the model to predict the mass balance for a glacier in 2010? Why or why not? (2 pts)
8. True or False? (1 pt each)
9. For SLR, the correlation coefficient, r, is the proportion of variation in y explained by the model with x.
10. A correlation coefficient close to 1 means that x causes changes in y
11. A possible correlation can be r = 2.1
12. Cook Distance is a measure of the leverage of a point.
13. Add a point to the scatterplot below that has high influence and low leverage. (3 pts)

