Homework #11 – Optional, Not Collected
STAT-UB.0103 – Statistics for Business Control and Regression Models

Problem 1

Sincich, Ex. 12.2. On part (f), do not find or interpret R_a^2.
(Note: if you have the 2nd edition, then the problem number is 11.2)

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Problem 2

Sincich, Ex. 12.72.
(2nd edition: 11.68)

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Problem 3

Sincich, Ex. 12.74.
(2nd edition: 11.70)

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Problem 4

Sincich, Ex. 12.78, parts (a)–(d).
(2nd edition: 11.74)

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Problem 5

Sincich, Ex. 12.96.
(2nd edition: Ex. 11.90)

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Problem 6

The file `Gesell.CSV` concerns a study of whether intelligence can be predicted based on the age at which a child starts to speak. For each of 21 participants in the study, the variable Age represents the age (in months) at which they spoke their first word, and the variable Score represents the Gesell Adaptive Score. (The Gesell test is an adult intelligence test).

(a) Without looking at the data, how would you expect Score to be related to Age? (Positively or negatively?)

(b) Make a scatterplot of Score versus Age. Does the plot show the relationship you predicted in (a)?

(c) Run the simple regression of Score on Age. Get the leverage and Cook's Distance values by clicking on Storage in the regression dialog box, and checking the boxes for leverage (Hi) and Cook's Distance.

(d) Use the regression output to compute the p-value for the coefficient of Age in the regression. Does this suggest that Score is related to Age?

(e) What proportion of the variance in Score is explained by Age, based on the regression output?

(f) Are there any data points with high leverage? Is the Cook's Distance corresponding to these points high enough to cause concern?

(g) Delete the data point with the largest value of Cook's Distance, by highlighting that case in the Minitab worksheet, and pressing the Del key. Now, re-run the regression. Describe the effects on the p-value for the slope, and on R^2. Is there now strong evidence of a linear relationship between Score and Age?

(h) Do you feel that it is justifiable to have deleted this point from the data set?

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