**Homework 10.**

**Assigned: 7 November 2017**

**Due: 5:00PM PST, 14 October 2017**

**Instructions: There are ten multiple choice questions. To receive credit, EMAIL your solution by the deadline to** [**tony\_statman@yahoo.com**](mailto:tony_statman@yahoo.com) **according to the following instructions:**

* The SUBJECT LINE must be “**GSBA545 HW10 for [Last name, First name] –** “ and then the ten letters corresponding to your answers; so, for example, if your name were John Doe, and you believed the answers were CABEDABCCD, then the subject line of the email must be “**GSBA545 HW10** for **Doe, John - BADBADBADD**”
  + The first seven characters (**GSBA545**) do not have a space between “GSBA” and “545”
  + The ten characters of your answer should have **no spaces in between**
  + If you submit less than 10 letters, it is assumed that the first letter corresponds to your answer to the first question, etc.
* The FIRST LINE of the body of the email should be your last name, your first name, and your student ID
* The SECOND LINE of the body of the email should be five letters, corresponding to the answers to the five questions (make sure your answer consists of five characters)

**For example, a typical email might be**

From: John Doe <john.doe@usc.edu>

To: tony\_statman <tony\_statman@yahoo.com>

Subject: GSBA545 HW10 for Doe, John - BADBADBADD

DOE, JOHN 123456789  
BADBADBADD

Data are available for 542 dishwashers (see <http://www.quietestdishwashers.com/most-viewed/> ). For each dishwasher, two numbers are available: the “noise rating” of the dishwasher, measured id dB, and the price of the dishwasher in dollars. Summary statistics are available below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Noise rating | Price |  |
|  | Average | 53.559 dB | $838.45 |  |
|  | SD | 5.909 dB | $372.03 |  |
|  | Correlation | r = –0.80785 | |  |

A scatter diagram showed that price was more or less a linear function of noise rating, with more or less constant variance, and the histogram of the residuals was close to normally distributed.

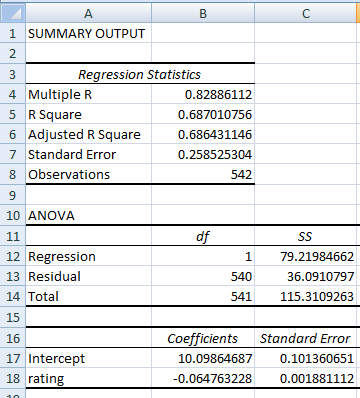
1. The Bosch SHX68M09UC dishwasher has a noise rating of 45 dB. Fill in the blank: according to this regression equation, 95% of dishwashers with a noise rating of 45 dB are expected to have a price from $\_\_\_ to $\_\_\_.

|  |  |  |
| --- | --- | --- |
| 1. 1241 to 1306 | 1. 841 to 1706 | 1. 911 to 1636 |
| 1. 1246 to 1301 | 1. 3394 to 3732 |  |

1. Fill in the blank: although we don’t know the exact average for all dishwashers with a noise rating of 50 dB, we can be 95% confident that the average price of all dishwashers with a noise rating of 50 dB is between $\_\_\_ and $\_\_\_.

|  |  |  |
| --- | --- | --- |
| 1. 1001 to 1038 | 1. 657 to 1382 | 1. 998 to 1041 |
| 1. 588 to 1451 | 1. 3394 to 3732 |  |

Suppose a researcher decides to use noise rating to predict ln(price) instead of price. Some computer output is given below:



1. What is a 95% confidence interval for the price of a dishwasher that made no noise (0 dB)?

|  |  |  |
| --- | --- | --- |
| 1. 3394 to 3732 | 1. -54.0 to -47.7 | 1. 9.90 to 10.30 |
| 1. -0.0685 to -0.0611 | 1. 19,921 to 29,666 |  |

1. What is the correlation between noise rating and ln(price)?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. 0.829 | 1. 0.910 | 1. 0.687 | 1. 0.259 | 1. -0.829 |

1. The Bosch SHX68M09UC dishwasher has a noise rating of 45 dB. Fill in the blank: according to this regression equation, 95% of dishwashers with a noise rating of 45 dB are expected to have a price from $\_\_\_ to $\_\_\_.

|  |  |  |
| --- | --- | --- |
| 1. 7.15 to 7.22 | 1. 6.67 to 7.69 | 1. 1269 to 1370 |
| 1. 792 to 2194 | 1. 9.90 to 10.30 |  |

Author Tomas Grim examined the relationship between alcohol consumption and normalized number of publications [as measured by Zpub] for sixteen current Czech avian ecologists (“A possible role of social activity to explain differences in publication output among ecologists”, *Oikos*, April 2008). The data for the sixteen “present” ecologists in the study are listed in the two columns below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Consumption | Zpub |  | Consumption | Zpub |  |
| 2.0 | 0.9 |  | 2.1 | 0.0 |
| 2.5 | –0.5 |  | 2.6 | 0.3 |
| 2.8 | 0.0 |  | 3.1 | 1.0 |
| 3.5 | 0.0 |  | 3.4 | 0.0 |
| 3.9 | 0.8 |  | 4.1 | 0.1 |
| 4.4 | 0.3 |  | 4.4 | –0.4 |
| 4.6 | –0.5 |  | 4.7 | –0.6 |
| 4.8 | –0.2 |  | 5.2 | –1.0 |

1. What is the regression line for using “consumption” to predict “Zpub”?
2. Predicted “Zpub” = 1.045 – 0.284 (consumption)
3. Predicted “Zpub” = –0.284 + 1.045 (consumption)
4. Predicted “Zpub” = 3.643 – 0.955 (consumption)
5. Predicted “Zpub” = 0.0125 – 0.521 (consumption)
6. Predicted “Zpub” = 1.047 – 3.815 (consumption)
7. What is the correlation between “consumption” and “Zpub”?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. –0.52 | B. –0.28 | C. 0.27 | D. –0.95 |  |
| E. Can not be determined from the information given | | | | |

1. What is the standard error of regression when predicting “Zpub” from “consumption”?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. 0.27 | B. 0.49 | C. 0.52 | D. 1.05 | E. 0.906 |

1. When using “consumption” to predict “Zpub”, how many of the residuals were positive?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. 4 | B. 5 | C. 6 | D. 7 | E. 10 |

1. The author states the data show that beer consumption causes lower productivity because of “well known negative effects of alcohol consumption on cognitive performance.” Does this study show that increased beer consumption will result in lower publications, on average?
2. Yes, since this was a random sample.
3. No, since the sample size was small (only n = 16)
4. Yes, since this was a randomized experiment, and randomized experiments can prove causality.
5. No, since this was an observational study, and observational studies could have confounding factors.
6. Yes, since the correlation was negative.