Stats 300   **Spring 2024**

Lab Assignment #8

This lab is due at 9:35 AM on Wednesday 2/14 ❤️ and is worth 6 points. This may be done individually, or in a group of 2 or 3 people.

1) You buy many pieces of furniture from IKEA. For each item, you note the price, and the number of steps it takes to assemble.

Price (dollars) Number of steps

Price (dollars)	Number of steps
40	14
45	3
85	15
103	27
120	10
138	25
175	31
200	32

a) Make a scatterplot.
b) Find the equation of best-fit line. Use price
for x. Plot the line on your scatterplot above.
c) Find the correlation coefficient r. Describe what your value of r means.
d) What is the predicted number of steps for a $150 item?
e) On average, if one piece of furniture is $50 more than another, how many more (or fewer) steps would it take to assemble?
f) Which item has the most steps relative to its price? How many more steps does it have compared to what is expected?

2) Use these made-up data about students in a statistics class to perform linear regression and answer the questions.

# of classes missed	Final grade
3	83.1
10	35.2
0	70.2
1	83.9
6	64.2
1	92.8
4	72.9
2	87.7
9	74.7

a) Make a scatterplot.
b) Find the correlation coefficient r. Describe what your value of r means.
c) Find the equation of best-fit line. Plot the line on your scatterplot above.
d) What is the explanatory variable for this problem? Why do you think this variable was chosen to be the explanatory variable?
e) Is the correlation positive or negative? Why would you expect this?

3) A biologist studies flight of different kinds of birds. The scientist notes the weight of each bird (grams) and the beat frequency (wing beats per second).

Weight	Beat frequency
40	11.9
85	11.7
90	9.4
200	11.0
380	10.3
480	5.8
525	6.6
680	1.7
830	3.0

a) Make a scatterplot.
b) Find the equation of best-fit line. Use weight
for x. Plot the line on your scatterplot above.
c) Find the correlation coefficient r. Describe what your value of r means.
d) What is the predicted beat frequency for a 700-gram bird?
e) On average, if one bird weighs 100 grams more than another, would its beat frequency be higher or lower? How much higher or lower?
f) Which bird has the fastest (largest) beat frequency relative to its weight? How different is its beat frequency from the predicted value?