Elementary Statistics

HW	10.3	part	2
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- 1. For 40 eruptions of the Old Faithful geyser in Yellowstone National Park, duration times (in seconds) were recorded along with the heights (in feet) of the eruptions. The linear correlation coefficient is r = 0.0915 and the regression equation is $\hat{y} = 0.180x + 47.4$ where x represents duration time. The mean of the 40 duration times is 245.0 seconds and the mean of the 40 heights is 127.2 feet.
 - a. Is there enough evidence to support a linear correlation based on this sample data and a significance level of 0.05?
 - b. What is the best predicted height of an eruption with a duration of 120 minutes?
- 2. The amounts of sugar (grams of sugar per gram of cereal) and calories (per gram of cereal) were recorded for a sample of 16 different cereals. The linear correlation coefficient is r = 0.765 and the regression equation is $\hat{y} = 1.01x + 3.46$ where x represents the amount of sugar. The mean of the 16 amounts of sugar is 0.295 grams and the mean of the 16 calorie counts is 3.76.
 - a. Is there enough evidence to support a linear correlation based on this sample data and a significance level of 0.05?
 - b. What is the best predicted calorie count for a cereal with a measured sugar amount of 0.40 grams?
- 3. Use the given data from an online poll that describes 8 students' PSAT and SAT scores:

PSAT	183	207	167	206	197	142	193	176
SAT	2200	2040	1890	2380	2290	2070	2370	1980

- a. Find the linear regression equation for this sample data.
- b. Determine if there is enough evidence to support a linear correlation based on this sample data and a significance level of 0.05.
- c. If another student had a PSAT score of 229, what SAT score would you predict for this student?

4. Use the given data from an auction that describes the opening bids and the winning bids for a sample of 5 items:

Opening Bid	1500	500	500	400	300
Winning Bid	650	175	125	275	125

- a. Find the linear regression equation for this sample data.
- b. Determine if there is enough evidence to support a linear correlation based on this sample data and a significance level of 0.05.
- c. If a pair of NY Knicks tickets were added to the auction and started with a bid of \$300, what would you predict the winning bid would be?

5. Use the given weights and prices of a sample of 6 diamonds that have a similar cut and clarity:

Weight	0.3	0.4	0.5	0.5	1.0	0.7
(carats)						
Price (\$)	510	1151	1343	1410	5669	2277

- a. Find the linear regression equation for this sample data.
- b. Determine if there is enough evidence to support a linear correlation based on this sample data and a significance level of 0.05.
- c. If you want a diamond that weighs 1.5 carats, what would you predict the price would be?