**Quiz 2.1: Scatterplots, Correlation & Linear Regression – Study Guide**

*Part 1: Multiple Choice*

1. Describe the correlation in the scatterplot at the right:
	1. No correlation
	2. Positive correlation
	3. Negative correlation
	4. Flat correlation
2. The correlation coefficient for a scatterplot of height & weight is *r = 0.81*. From this information alone, we can say height and weight have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	1. Strong negative correlation
	2. Weak negative correlation
	3. Strong positive correlation
	4. Moderate positive correlation
3. Rachel is stocking her concession stand for a day in which the temperature is expected to reach 106 degrees Fahrenheit. Over the years, she has collected data on how many bottles of water she has sold for specific air temperatures. Using this data, Rachel has found that the relationship between temperature and number of bottles sold can be modeled using the linear equation:

$$number of water bottles sold=4.44\left(temperature\right)-187.67$$

Use this equation to predict how many bottles of water Rachel should stock for the upcoming 106 degree day.

1. 67
2. 283
3. 294
4. 471

*Part 2: Free-Response*

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| --- | --- |
| **Amount of Restaurant Bill ($)** | **Tip Amount ($)** |
| 45.55 | 7.00 |
| 52.00 | 15.00 |
| 66.00 | 6.00 |
| 24.44 | 6.00 |
| 57.90 | 15.00 |
| 89.75 | 23.00 |
| 33.00 | 8.00 |

1. Deon is a waiter. He wants to be able to predict the amount of money he will make in tips based on the amount of his customer’s restaurant bill. Deon remembered what he learned about linear regression in his Financial Statistics class and decided to collect data to help him figure this out. The data appears at the right.
	1. What is the explanatory variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the response variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Use the graph below to make a scatterplot of the data. How would you describe the correlation you see in the data (circle one)? positive negative no correlation

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Tip amount ($)

Amount of bill ($)

* 1. The regression line for this data is *y = 0.22x – 0.27.* Interpret the slope of the regression line using the language we discussed in class:

*For every $1 increase in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ increases by $\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.*

* 1. Use your regression equation to predict how much money Deon will make in tips on a $60 restaurant bill. *Show your work!*
	2. How much faith do you have in your prediction? Write a few sentences interpreting each of the following: # data points, scatterplot trend, correlation coefficient *r =0.75* , the coefficient of determination *r2*= 0.5626, and your common sense.