Module 07 HW

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Word Document

**Exercises 8.6, 8.22, 8.32**

**Exercise 8.6 Husbands and wives, Part I**

1. Husbands’ and wives’ ages have strong, positive linear correlation. There seems to be constant variability throughout the data. As husbands’ ages increase, wives’ ages also increase.
2. There is no real trend or correlation in the height data for husbands and wives. No real linear relationship.
3. With correlation being the strength of linear relationship, the ages plot shows stronger correlation than the height plot. Since the height plot does not show much linearity and age plot shows strong linear relationship, the age plot shows stronger correlation.
4. This conversion does not affect the correlation between husbands’ and wives’ heights.

**Exercise 8.22 Nutrition at Starbucks, Part I**

1. Numbers of calories and amount of carbohydrates have relatively positive correlation. There is not the most constant variability in the data, but enough to see the positive relationship. Most of the data points tend to follow a positive trend of the more calories a menu item has, the more carbohydrates.
2. Explanatory variable: Calories

Response variable: Carbohydrates

1. Since the data shows relatively positive linear relationship, we can fit a regression line to help us predict how many carbohydrates are in a menu item given how many calories are in the menu item.
2. Conditions that need to be met: Linearity, nearly normal residuals, constant variability.

Linearity: Yes, data has positive linearity.

Nearly normal residuals: Yes, residuals look nearly normal.

Constant variability: Not the most constant variability, but enough to see positive linear relationship. There could be more constant variability, but I believe there is enough to conclude this condition is met.

**Exercise 8.32 Beer and Blood Alcohol Content**

1. There seems to be a positive linear relationship with constant variability between cans of beer drank and higher BAC. The more cans of beer you drink, the higher BAC.
2. BAC-hat = -0.0127 + (0.018 X Cans of beer)
3. Null Hypothesis: The number of beer cans drank is not a good predictor of BAC.

Alternative Hypothesis: Number of beer cans is a significant predictor of BAC.

The p-value is approximately 0.

Since p-value is approximately 0, we reject the null hypothesis that number of beer cans is not a good predictor of BAC.

1. R = 0.89

R^2 = 0.7921

This states that 79.21% of the data is explained by our linear regression line of

BAC-hat = -0.0127 + (0.018 X Cans of beer).

1. I think that there would still be a positive correlation in the new data that we get going to a bar and running the same experiment. Since our new data would be at a bar where you assume those drinking are much older than the 21+ year old Ohio State students, we can assume that those at the bar have higher alcohol tolerances. Since their alcohol tolerances will be higher, we can assume that the BAC’s may be slightly lower than those of the Ohio State students. However, I believe the same trend would hold true that the more cans of beer consumed would lead to higher BAC.