Stat 217 Homework 7

Due Friday, October 30th

The *European School Study Project on Alcohol and Other Drugs* published an investigation of the usage of marijuana and other drugs. Data from 11 countries were collected, including the percentage of ninth graders who reported smoking marijuana and who have used other drugs (cocaine, amphetamines, etc.). We are interested in how the percentage of marijuana users effects the percentage of other drug users.

1. A scatterplot of the percentage of other drug users versus the percentage of marijuana users is shown. What is the direction of the association?



1. Positive
2. Negative
3. No clear direction
4. Not enough information
5. What is the response variable?
6. What is the explanatory variable?
7. The hypothesized regression model for examining this association is

. How is interpreted in the context of the problem?

1. The proportion of the variability in the percentage of other drug usage that is explained by the regression model with marijuana usage as a predictor.
2. The difference in the observed other drug usage and the predicted other drug usage.
3. The average other drug usage in countries with no marijuana usage.
4. The average change in other drug usage associated with a 1% increase in marijuana usage.
5. Below is the output for the simple linear regression model. Report the estimated regression equation.



1. What is the average percentage of other drug usage we would expect for a country that has 25% of ninth graders who have used marijuana?
2. What is the proportion of the variability in other drug usage explained by the linear model with marijuana usage as a predictor?
3. We decide to predict the percentage of other drug usage from a country with no marijuana usage. What is the potential problem with doing this?
4. Calculate a 95% confidence interval for the slope using .
5. Interpret the interval you calculated above in the context of the problem.
6. Conduct a test for a linear relationship between marijuana usage and other drug usage.
7. State the null and alternative hypotheses.
8. What is the test statistic?
9. What distribution does the test statistic follow under ?
10. What is the p-value?
11. State your conclusion in the context of the problem. Include a scope of inference.
12. True or False. We can conclude that increases in marijuana usage causes an increase in other drug usage in these sampled countries since we had a small p-value for our slope coefficient.