

Quiz 3

Instructions

For questions 2-10 in quiz 3 you need to work with the US State Facts and Figures dataset available in R. You need to follow the following steps in your R Markdown.

1. Load the data using the following two commands:

```
library(datasets)
```

```
statedemo<-data.frame(state.x77)
```

(state.x77 is a matrix and data.frame converts to a dataset called statedemo)

2. Search “state” in R help at the right lower quadrant of your RStudio interface. The results should show you information on the variables available in the dataset and their units of measurement.

3. Create a dummy variable, say *HSEducated*, that takes values equal to 1 if a state has more than 50% of high school graduates and 0 otherwise:

```
statedemo$HSEducated=factor(statedemo$HS.Grad>=50)
```

(you can also use *ifelse* command in R)

4. Run two separate regressions. In the first regression, regress ***Murder*** on ***Illiteracy*** and in the second regression regress ***Murder*** on the ***HSEducated*** dummy variable. Display the results in one stargazer table (do not forget to use *cse* function to obtain heteroskedastic standard errors)

Question 1

1 / 1 pts

1. Consider the following regression line: estimated $Y = 5.4 + 3.2X$. You are told that the t-statistic on the slope coefficient is 2.13. Thus,

- ☐ We cannot reject the null hypothesis that the slope is greater than 0 at 5% significance level
- ☐ We cannot reject the null hypothesis that the slope is less than 0 at 5% significance level.
- ☐ We cannot reject the null hypothesis that the slope is equal to 0 at 5% significance level.
- ☒ We can reject the null hypothesis that the slope is equal to 0 at 5% significance level.

Correct!

Question 2

1 / 1 pts

Heteroskedasticity means that

- ☐ The observed units have different values
- ☐ The OLS estimator is biased.
- ☐ Homogeneity cannot be assumed automatically for the model
- ☒ The variance of the error term is not constant

Correct!

Question 3

1 / 1 pts

1. When regressing Murder on Illiteracy, the estimated coefficient on Illiteracy suggests that:

- ☐ An increase in the murder rate by 1% increases the illiteracy rate by 4.26%.
- ☒ An increase in illiteracy rate by 1% increases the murder rate by 4.26 people per 100,000 people
- ☐ An increase in the murder rate by 1% decreases the illiteracy rate by 4.26%.
- ☐ An increase in illiteracy rate by 1% decreases the murder rate by 4.26 people per 100,000 people

Correct!

Question 4

1 / 1 pts

When regressing Murder on Illiteracy, the estimated intercept is:

- ☐ meaningless.
- ☐ the average murder rate
- ☐ None of the others.
- ☒ The average murder rate when illiteracy is 0.

Correct!

Question 5

1 / 1 pts

When regressing Murder on Illiteracy, the t-statistic on the estimated slope coefficient is _____ and we _____ reject the null that the slope is equal to 0 at 5% significance level.

- ☒ 8.08; can
- ☐ 1.96; cannot
- ☐ 0.53; cannot

Correct!

- ☐ 12.45; can

Question 6

1 / 1 pts

When regressing Murder on the dummy variable HSEducated, the R-squared suggests that:

Correct!

- ☒ 69% of the variation in murder rate is left unexplained by the model.
- ☐ 31% of the variation in murder rate is left unexplained by the model.
- ☐ 50% of the variation in murder rate is explained by the model.
- ☐ Only 3% of the variation in murder rate is explained by the model.

Question 7

1 / 1 pts

When regressing Murder on the dummy variable HSEducated, the estimated coefficient on HSEducated means that:

- ☐ States with more than 50% high school graduates have, on average, 4.55 murders per 100,000 people

Correct!

- ☒ States with more than 50% high school graduates have, on average, 4.55 fewer murders per 100,000 people.
- ☐ States with less than 50% high school graduates have, on average 4.55 fewer murders per 100,000 people.
- ☐ An increase in the percentage of high school graduates by 1%, will decrease the murder rate by 4.55 people per 100,000 people.

Question 8

1 / 1 pts

When regressing Murder on the dummy variable HSEducated, the estimated Constant means that:

Correct!

- ☒ The average murder rate in states with less than 50% high school graduates is 10.66 murders per 100,000 people
- ☐ The average murder rate in states with less than 50% high school graduates is 10.66 fewer murders per 100,000 people than other states.
- ☐ The average murder rate in states with more than 50% high school graduates is 10.66 murders per 100,000 people



The average murder rate in states with more than 50% high school graduates is 10.66 fewer murders per 100,000 people than other states.

Question 9

1 / 1 pts

When regressing Murder on the dummy variable HSEducated, the 95% confidence interval for the estimated coefficient on HSEducated is:

☐ None of the others.

☒ (-6.47, -2.63)

☐ (-5.53, -3.57)

☐ (-0.98, 0.98)

Correct!

Question 10

1 / 1 pts

Suppose that you regress Murder on a dummy variable **HSUneducated** that equals 1 if the state has less than 50% high school graduates, and 0 otherwise. You expect the estimated Constant to equal _____

and the estimated coefficient on HSUneducated to equal _____.

☐ -10.66; 4.55

☒ 6.11; 4.55

☐ 10.66, -4.55

☐ -6.11; -4.55

Correct!

Quiz Score: **10** out of 10