

COLORADO STATE UNIVERSITY

Assignment 1
Fall 2023

Agricultural & Resource Economics / Economics 535
Applied Econometrics

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This assignment is worth 25 points. This work is to be an independent effort on your part. Please show your work concisely. Printed spreadsheet pages are preferred for calculations. A handwritten document is sufficient for the other questions but MSWord is preferred. Correct answers that are disorganized and do not have clear supporting discussion are worth little. Communication is important. And so is clarity.

1. Answer exercise 2.9 in Gujarati & Porter.
2. Answer exercise 3.11 in Gujarati & Porter. Do not use sample notation: $\sum_{i=1}^N \frac{X_i}{N}$. Use expectation notation: $E(X)$ – also $V(X)$ and $Cov(X,Y)$.
3. Answer exercise 3.17 in Gujarati & Porter.
4. Refer to exercise 3.23. Using $\ln(\text{RGDP})$ as Y and X as defined in the exercise, construct a table that is similar to Table 3.2 and that includes the work in the notes at the bottom. (One printed page for the spreadsheet and results in a clearly labeled table.) Use the data provided and not the data in the textbook. Be careful to define $Y = \ln(\text{RGDP})$. Also, there are some typos in the table notes that are correct in the text. Refer to the text.
5. Using the data from question 4, also construct: the correlation of Y and X , the correlation of y and x , the mean of Y and X , the variance and standard deviation of Y and X , and the predicted value of Y for the year 2023. (One year out of sample.)
6. Conduct a two-tailed test of intercept and slope coefficient estimates. Use an alpha level of 5%. Conduct a one-tailed test of the slope coefficient as in the notes. Calculate the p-value for the intercept and slope coefficients. Calculate a 90% confidence interval for the error variance.
7. What is the variance, and square root of, for the predicted value of Y ? (This is needed for a confidence interval on the predicted value.)
8. What is the estimate of the error variance, and square root of, using the maximum likelihood estimator? Likewise, what are the variances, and standard errors, of the intercept and slope coefficients?
9. Answer exercise 5.5 in Gujarati & Porter.
10. Optional: Answer exercise 4.3 in Gujarati & Porter.