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Economics 741
Homework #3 Assignment)
Due 9 Oct 2017

For this homework, you will be answering the following questions from Chapter 6. Up to 8 bonus points for LaTeX

Please turn in the following:

- A write up
  - If I ask you to compare some numbers, please show me the numbers in the writeup.
  - If you are using LaTeX, print output in table form when it is more than just one number
  - If you are not using LaTeX, paste things into some sort of table
- All code (.do and .R)
- All output (Stata .log file and R workspace)

Using augmented data on hours of work and earnings (now including years of education and marital status) in CH6.dta, please answer the following questions or explain to me why they cannot be answered.

1. **Polynomials: (19 points)** (Stata)
   Let's see how income varies with age. First construct your sample. We will want to study individuals who are (inclusively) between 16 and 65 years of age, have positive earnings, and worked more than 1000 hours in a year. Pick a polynomial specification (of age) to run.

   (a) Present the results from your regression. (5 points)

   (b) Explain to me why you picked the specification you did. (6 points)

   (c) Give the average marginal effect and the average of the marginal effects. (4 points)

   (d) Discuss the significance of your polynomial overall as well as the individual terms. (4 points)

2. **Indicator Variables and Interactions: (14 points)** (Stata)
   Let's now see how earnings varies with marriage. Use the marst variable to create three indicator variables for whether people are a) never married b) currently married c) formerly married.

   (a) Put all three indicator variables into your model. Discuss the results. (6 points)

   (b) Run a model that will test whether or not married people see their wages go up more quickly with age than people who were never married. Discuss the results. (8 points)

3. **Functional Form: (16 points)** (Stata)
   Construct a variable that is years of education. Report and interpret (in one sentence each) the following coefficients with a model of earnings on education:

   (a) Linear-Linear (4 points)

   (b) Log-Linear (4 points)

   (c) Linear-Log (4 points)

   (d) Log-Log (4 points)

4. **Heteroskedasticity (32 points)**: (Stata and R)
   Let's now examine evidence for heteroskedasticity and a test for heteroskedasticity running a simple model of earnings on age and age squared (with above sample restrictions).

   (a) Is there evidence of heteroskedasticity based on age? Show me in a picture. Discuss. (12 points)

   (b) Obtain robust standard errors in R and Stata. (18 points)