

Problem Set 1 Solutions

BUAN 6356

Due: Monday, 2018-01-29-11:59pm

Deliverable: an R source-code file named ps1.r

Question 1

Data The data for this question comes from the file Wage1.csv. This data is for various workers at the employee-level. We have data on their average hourly wage along with information about their years of education, experience, tenure (years at the same firm), and some job/industry characteristics.

Analysis

- Read the data Wage1.csv into a new variable using the data.table package (use a data.frame if you still can't install data.table): context1
- Use summary statistics to familiarize yourself with the data.
- Generate a new variable that is the natural logarithm of wage. Name it: lwage
- Run the following linear model using the 'lm' function. Store the result in: model1

$$\text{wage}_i = \beta_0 + \beta_1 \text{educ}_i + e_i \quad (1)$$

- Run the following linear model using the 'lm' function. Store the result in: model2

$$\text{wage}_i = \beta_0 + \beta_1 \text{educ}_i + \beta_2 \text{exper}_i + \beta_3 \text{tenure}_i + e_i \quad (2)$$

- Run the following linear model using the 'lm' function. Store the result in: model3

$$\text{lwage}_i = \beta_0 + \beta_1 \text{educ}_i + \beta_2 \text{exper}_i + \beta_3 \text{tenure}_i + e_i \quad (3)$$

Interpretations a. Interpret the estimated coefficient on educ from model1 (eq 1).

Every one year of education is associated with a \$0.54470 increase in per hour wage.

b. Interpret the estimated coefficient on educ from model2 (eq 2).

Every one year of education is associated with a \$0.60268 increase in per hour wage controlling for experience and tenure.

c. Interpret the estimated coefficient on exper from model2 (eq 2).

Every one year of experience is associated with a \$0.02252 increase in per hour wage controlling for education and tenure.

d. Interpret the estimated coefficient on tenure from model2 (eq 2).

Every one year of tenure is associated with a \$0.17002 increase in per hour wage controlling for education and experience.

- e. Interpret the estimated intercept from model2 (eq 2).

According to our model, a person with no education, experience, and tenure is expected to earn $-\$2.91354$ for every hour worked. Obviously, no one like this is included in the data. Such a person would probably choose not to work at all.

- f. Interpret the estimated coefficient on educ from model3 (eq 3).

Every one year of education is associated with a 9.2256% increase in per hour wage controlling for experience and tenure.

- g. Interpret the estimated coefficient on exper from model3 (eq 3).

Every one year of experience is associated with a 0.4137% increase in per hour wage controlling for education and tenure.

- h. Interpret the estimated coefficient on tenure from model3 (eq 3).

Every one year of tenure is associated with a 2.2112% increase in per hour wage controlling for education and experience.