

# Assignment 1

## Instructions

For question 1, you can submit a PDF or scanned copy of your work. Please consult with me if you don't know how to accomplish this.

For questions 2-5, you must use STATA, and must turn in a copy of your Do-file. The Do-file must perform every task below neatly and correctly.

The work you hand in must be your own. You must NOT copy any answers from anyone or anywhere else. Please review [FIU's policy on academic misconduct](#) for more information.

## Questions

1. Derive the second-order condition (SOC) for the OLS estimator - see class notes for week 2, equations (I) and (II) as a starting point.
2. From the questions at the end of Chapter 1 of your textbook, questions C1.(i), C1.(ii), and C1.(iii) using the [WAGE1](#) dataset.
3. Generate the dataset below using STATA's command line:

var1	var2	var3
2	6	10
4	32	6
10	24	4

Hint: You might want to use the *help* function to look at the *input* command

- (a) Using STATA's command line, create a variable named **var4** with values: **1** in row 1, **2** in row 2, and 1 in row 3.
- (b) Rename the variable **var4** to **sex**, and use the *label* command to define value labels **male** for value 1, and **female** for value 2.
- (c) Use the generate *command* with the *\_n* system variable to create a variable called **idx** that assigns a unique number to each row
- (d) Rename variables **var1**, **var2**, and **var3** as **time1**, **time2**, and **time3**
- (e) Use the *reshape* command to convert the dataset into long form by year
- (f) Use the *egen* command to generate a new variable named **d** that is equal to the squared difference between the variable time at each occasion and the average of time for each subject
- (g) Drop the observation/row corresponding to the third year for id=2

4. The following table contains monthly housing expenditures for 10 families:

Family	Monthly Expenditures
1	300
2	440
3	350
4	1100
5	640
6	480
7	450
8	700
9	670
10	530

(a) Calculate and report the average monthly housing expenditure

(b) Calculate and report the median monthly housing expenditure

(c) Modify the data to reflect an increase from \$700 to \$900 for Family #8 (expenditures for all other families remain the same). Report the average and median house expenditures

5. [Vella and Verbeek \(1998\)](#) use the National Longitudinal Survey Youth Sample dataset to study the impact union membership has on wages for young males. You can get the dataset from [here](#).

(a) Create a variable equal to the exponential of **lwage**.

(b) Generate a new variable that represents the annual salary (for each observation)

(c) Collapse the data to obtain the mean annual salary by year and ethnic|racial group, black, hispanic, other, etc.

(d) Generate a line graph showing the mean annual salary over time for each ethnic|racial group.