

Applied Problems 3

Research Methods II
Computational Economics
University of Exeter, 2020

Description:

Please attempt the below two problems. Feel free to attempt problem 1 with any publicly available language you wish. If you attempt the problems in Stata, you will likely be able to use some of the work that we do together in class on 06/03/2020 to help in responding to some elements of the problem. Question 2 is related to materials we will work through together on 13/03/2020.

Please send your answers to damian.clarke@protonmail.com by Thursday March 19, 2020 at 23:59. Your answers should consist of the code you write, with any necessary comments or documentation in the body of the code, and a document presenting the output of question 1, along with your written responses to the questions. This document should include all necessary graphical and statistical output.

The mark will be assigned in the following way: Does the code for question 1 work in the way it should? (40%); To what extent does the document respond to the questions raised in problem 1 (40%); Clarity of documentation to the code based on comments within the code (5%); Have you completed question 2 (15%). For question 1, please ensure that you do not use the same data or example as other coursemates.

If you have any questions, please write to damian.clarke@protonmail.com.

Questions:

1. Choose a country of interest. Choose two phenomena of interest for which you can find real micro-data from the internet, where these data have some sub-national variation (eg at the level of the state, county, municipality or similar). These datasets should contain a variable of interest, as well as a record capturing the geographic area for each observation. For example, one simple example would be a file recording microdata on births, where each birth record contains the state or municipality of birth, as well as measures of health at birth. These variables should be in some very broad sense related to economic phenomena (this can be in any field and in any way). Feel free to use any data that is of interest to you.
 - (a) Take your two micro-data sets and ‘collapse’ your variables of interest so that you have two separate geographic-level averages. Generate simple graphical or tabular summary statistics of these two variables.
 - (b) Take the two separate variables measured at the same geographic level (eg state, county, etc.), and ‘merge’ the two variables to form a single dataset with both variables.
 - (c) Provide some sort of reasonable two way plot (eg see here for plot types in Stata: <https://www.stata.com/manuals13/g-2graphwoway.pdf>) to display the relationship between these two variables at the collapsed level.
 - (d) Search for and download a shape file which allows you to make a map of each of the variables at the level of geographic variation that you are considering.
 - (e) Discuss the above results, and any observed relationships between the phenomena you have chosen. As well as describing the results you observe, comment on whether you believe any relationship observed is causal, correlational, or both. Feel free to refer to other studies if necessary or useful here.

2. This question is related to the use of programming languages and a computational environment more generally. To complete this question, simply undertake the following three steps:
- (a) Install Python on your own operating system. In order to complete question (c) in a simple way, it is suggested that you install a version of Python starting with 2 (eg Python 2.7) rather than a version of Python starting with 3 (eg Python 3.8). This program may be installed by default depending on your operating system, and if this is the case, simply skip to part (b). If Python is not installed and you have never undertaken the installation of a programming language on your operating system, it may be useful to follow an online tutorial related to installation of Python on your particular operating system.
 - (b) Once you have a version of Python installed, run a simple 'hello world' program. Submit a screen shot of this program's output.
 - (c) Finally, check that you can run the program `scrape_xkcd.py` (discussed in class on 13/03/2020), providing a small screen shot of some output.