Assignment 3: MLE

February 13, 2020

The goal of this exercise is to familiarize with basic discrete choice models and introduce the practice of writing objective functions. We will use data from "A theory of Extramarital Affairs". A basic description of the data is available here.

Exercise 1   Basic description

- Document correlations between the occurrence of affairs and observed attributes in the data.

- Plot the histogram of affairs by gender, age groups, religiousness, and education.

Exercise 2   Linear Regression

- Run a linear regression of the determinants of having an affair controlling for education, gender, occupation, age, presence of children, degree of religiosity, number of years married, as well as satisfaction rating of marriage.

- Test for various specifications using for example interactions between the variables.

Exercise 3   Probit

- Recode the affair variable into a dummy variable which is equal to 0 if the individual did not have any affair, and 1 otherwise.

- Write the likelihood of the binary decision of having an affair including an intercept, dummies for education, dummies for gender, dummies for presence of children in the household, dummies for the degree of religiosity, number of years married, as well as dummies for satisfaction rating of marriage. Write the likelihood function affairs_probit.

- Estimate a similar specification using the pre-programmed function in glm.

- Evaluate your likelihood function at the estimates obtained under glm. How do your likelihood function compared with the likelihood estimates obtained under glm.

Exercise 4   Logit

Redo the same exercise as 3 but using the logit model.

Exercise 5   Multinomial Logit

- Using the original data, write the likelihood of the conditional, multinomial and mixed logit.