Homework 4

It is **unnecessary** to submit this homework.

1. [50 points] The data in fertil2.csv includes, for women in Botswana during 1988, information on number of children, years of education, age, and religious and economic status variables.
1) Estimate the model

$$children = \beta_0 + \beta_1 educ + \beta_2 age + \beta_3 age^2 + u$$

by OLS, and interpret the estimates. In particular, holding *age* fixed, what is the estimated effect of another year of education on fertility? If 100 women receive another year of education, how many fewer children are they expected to have?
2) $Frsthalf$ is a dummy variable equal to one if the woman was born during the first six months of the year. Assuming that $frsthalf$ is uncorrelated with the error term in part 1), show that $frsthalf$ is a reasonable IV candidate for *educ*. (Hint: You need to do a regression.)
3) Estimate the model from part 1) by using $frsthalf$ as an IV for *educ*. Compare the estimated effect of education with the OLS estimate from part 1).
4) Add the binary variable *tv* to the model and assume this is exogenous. Estimate the equation by OLS and 2SLS and compare the estimated coefficients on *tv*. One claims that television ownership has a negative effect on fertility. If *educ* is endogenous, does your result support the claim?