Masoud Jabbari Empirical Methods Set#3

Unfortunately the results are not good, for example the gradian is very high, but I could not find my errors in coding, so I report the results anyway. I tried many initial points, but at the end I report the results for the initial guess

Q1.

For question one the results of the regression via Nelder-Mead method for maximum likelihood is as below:

$$No\_affairs = 10.92 - 0.489 * Age + 0.797 * married\_years - 0.739 * religious + 0.1262 * occupation - 1.407 * self\_rate\_of\_marriage$$

With fminsearch method which is based on Nelder-Mead I find:

$$No\_affairs = 2.534 - 0.0323 * Age + 0.1157 * married\_years - 0.354 * religious + 0.0798 * occupation - 0.4094 * self\_rate\_of\_marri$$

Q2.

For question two I tried all 3 quasi-Newton methods of steepest descent, DFP, and BFGS; but in all since the gradian was very larg, the code did not converge. I have left the steepest descent code commented in my MATLAB file.

With fminunc which is based on BFGS, I find:

With fminsearch method I find:

$$No\_affairs = 2.534 - 0.0323 * Age + 0.1157 * married\_years - 0.354 * religious + 0.0798 * occupation - 0.4094 * self\_rate\_of\_marri$$

where the results are same as fminsearch method for question 1.

Q3. With lsqnonlin command for non-linear least squares, I find

$$No\_affairs = 7.02 - 0.2216 * Age + 0.4160 * married\_years - 0.8405 * religious + 0.1409 * occupation - 1.8248 * self\_rate\_of\_marri$$

Q4. For question one the results of the regression via Nelder-Mead method for maximum likelihood is as below:

$$No\_affairs = 12.30 - 0.541 * Age - 0.1179 * married\_years + 0.0879 * religious + 0.1632 * occupation - 0.433 * self\_rate\_of\_marria$$

and via fminsearch I find:

$$No\_affairs = 2.51 - 0.0384 * Age + 0.1141 * married\_years - 0.2796 * religious + 0.0676 * occupation - 0.3698 * self\_rate\_of\_marri$$

Q5. In all estimations the sign og the coefficients are as expected and same as the paper. About the time, what I find is that Nelder is the fastest. Fminunc is the most robust one among all.