HW 3

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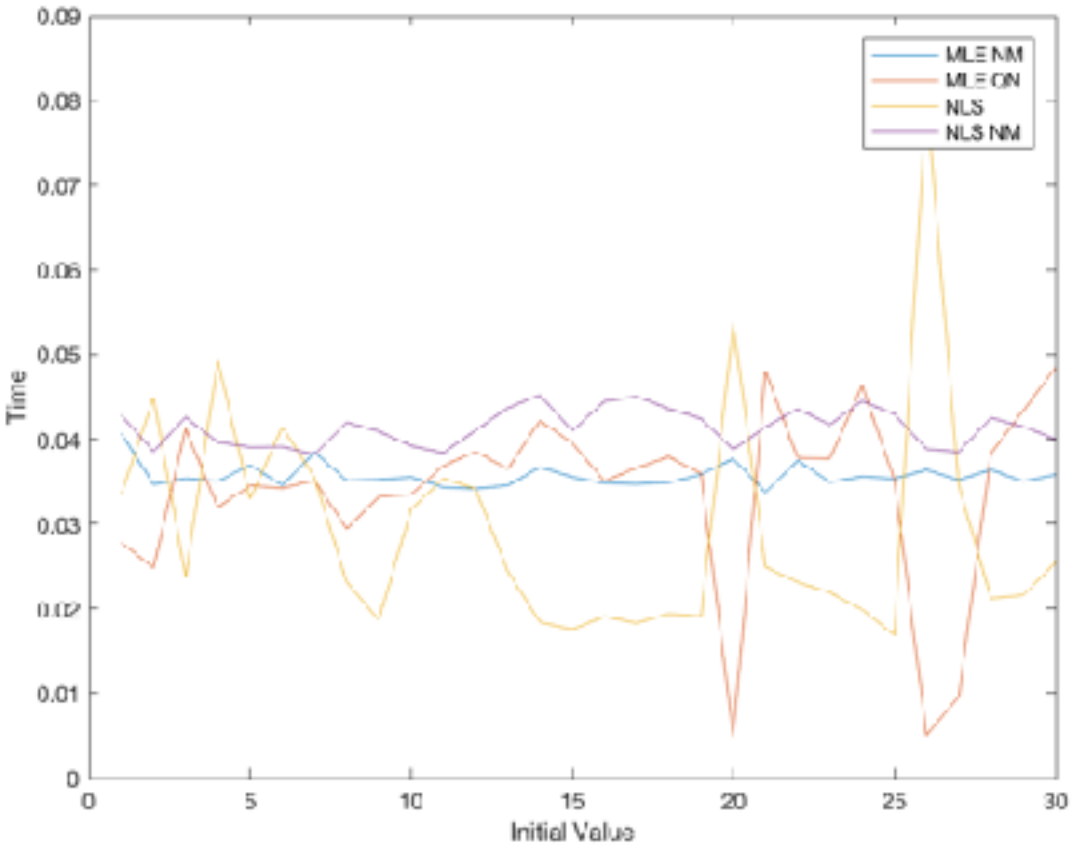
Question 1: See the code down below.

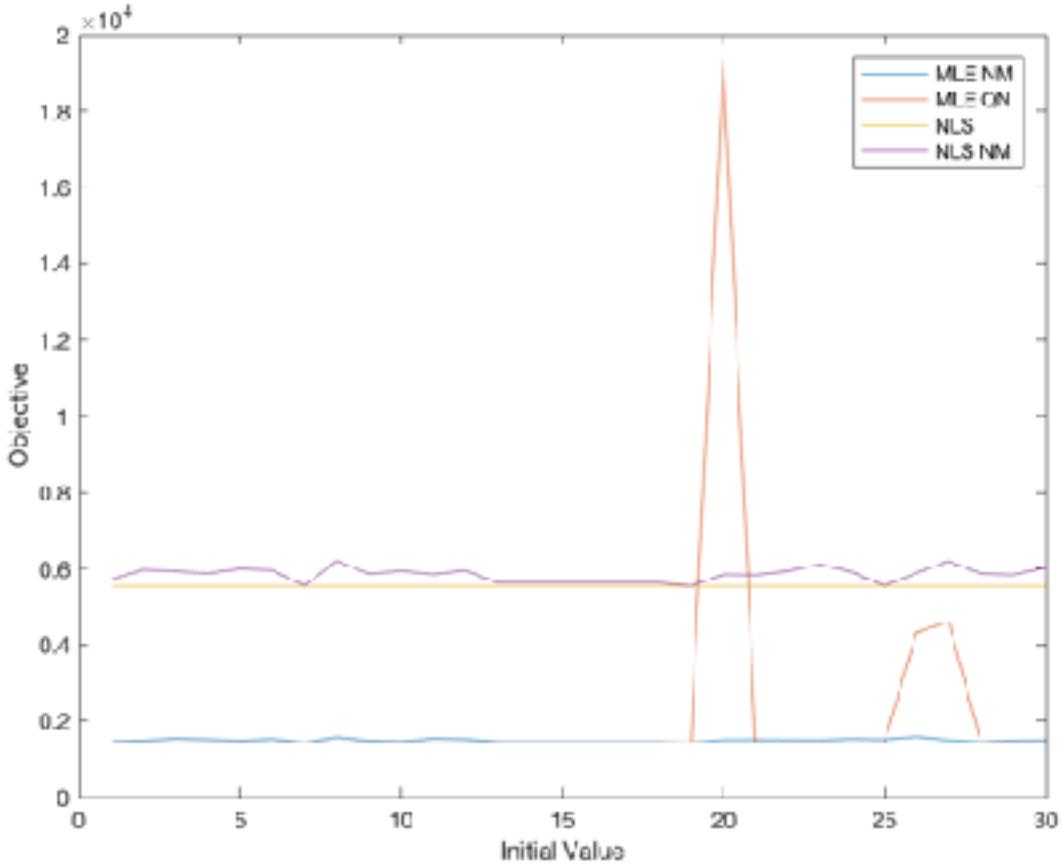
Question 2: I am using BFGS method here, it ultimately boils down to the fminunc function in Matlab.

Question 3: It uses BFGS method.

Question 4: See the code down below.

Question 5: In this exercise, I start with guessing initial value to be (0,0,0,0,0,0), then change one of them while keeping all others zero, the changing values considered are (-1,-0.5,0,0.5,1). Thus, all together 30 different initial values for considered. The following two figures plot the time to convergence and objective function value at ``optimum" for 4 different methods considered above.





- From the perspective of time to convergence, it seems that NM simplex method is more efficient.
- In terms of robustness to initial values, NLS is the most robust more, while all others tend to stop at local optimum.