

Matlab questions – Modern Macro

Only for the Final Exam (Option B), not for the final test (Option A)

ISCTE–IUL, May 2014

I. How many windows do we find in Matlab and what is the purpose of each one of them? **(10 points)**

II. Write a routine code in order to have in the same figure the following three functions represented:

$$\begin{aligned}f(x) &= 2x^2 + 3x + 6 \\g(x) &= -4x + x^2\end{aligned}$$

with x defined in the interval $[-2, 4]$. **(10 points)**

III. Suppose we have a file called *UE_data.txt*, which includes quarterly observations of the following four major macroeconomic variables for the European Union: GDP (in column one), Consumption (column 2), Investment (column 3) and the rate of unemployment (column 4). The first observation is the first quarter of 1995, and the last one is the fourth quarter of 2013.

1. Write a routine that graphically represents the four time series in 4 panels. **That is: 4 panels in 1 same figure. (10 points)**
2. Write a routine that compares the evolution (that is, the time series) of the unemployment rate and GDP in a `plotyy`. **(10 points)**

IV. Write a routine that is capable of showing the dynamics of the following stochastic process (x_t):

$$x_{t+1} = 2 + 0.5x_t + (1/10)\varepsilon_t$$

where ε_t is a IID random variable, with mean equal to zero and variance equal to 1. In Matlab this random variable is written as: `randn(1)`. Simulate the dynamics of this process for $t = [1, 80]$. **(10 points)**