Exercise 2 – *Bayesian inference and Data assimilation*

Due by: Tuesday, 2 May 2023, 23:59 (CEST)
Please refer to the assignment submission guideline on Moodle.

Reading assignment This time, we will implement the Lorenz-63 model in the textbook, namely example 1.1, 1.2 and 1.4. Read the chapter 1 of the lecture note carefully.

Assignment Solve Problems 1.1, 1.2 and 1.3 in pp. 27–28.

Notes Use the perturbed Euler scheme:

$$z_{n+1} = z_n + \Delta t \big(f(z_n) + g^n \big)$$

where Δt is the time step and g^n is given by the so called tent map in Example 1.1, which will give you a deterministic but chaotic perturbation. The observation is given by the first coordinate of the fine-grid simulation with additive measurement error. The observation is given in much smaller frequency than the fine-grid simulation.
For visualization, you do not have to worry about 3D plot. You may time vs each coordinate for visualization.