README

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This code plots first the eigenvalues of open loop and closed loop system, then the analytical solution of the Ricatti equation P and the numerical solution using EnKF $P^{(N)}$ on the same plot entry wise. The dynamics matrices are randonly generated.

The code is written in Python 3 and there are three files: `constants_enkf.py, enkf.py, LQSys.py`. The steps for running the code are as follows:

1. In `constants_enkf.py`, set the desired variables as per the modelling and simulation parameters, see Table 1 and Table 2 respectively for location of these variables in the code.
2. Run `enkf.py`

Table 1: Modelling parameters in `constants_enkf.py`

Modelling parameter	Variable name in code	Line number in code	
		$d = 1$	$d \geq 2$
A	`A`	24	31
$C^\top C$	`Q`	34	34
R	`R`	35	35
Seed for RNG	`SEED0`	12	12

Table 2: Simulation parameters in `constants_enkf.py`

Modelling parameter	Variable name in code	Line number in code
Total simulation time (T)	`T`	4
Stepsize (Δt)	`STEP`	5
Number of repetitions for averaging	`NAVG`	7
Vector of number of particles	`NVEC`	9
Length of vector of number of particles	`NSIM`	8