**Solution ASSIGNMENT 2, Dynamic System Estimation, 14.05.2019**

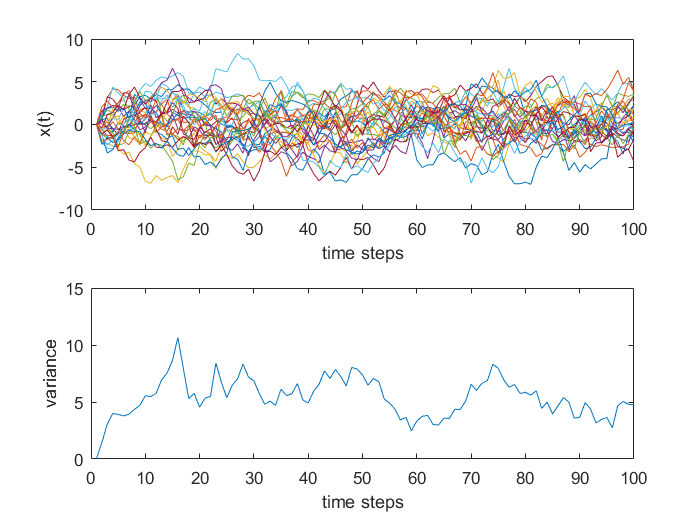
**Task 1:**

The transition matrix is obtained by

Phi = exp( -β\*dt)

One realization of the Gauss-Markov process is computed by

x(n+1) = Phi \* xn + w(t), n = 1:100, x0 = 0, w(t) = Gaussian noise



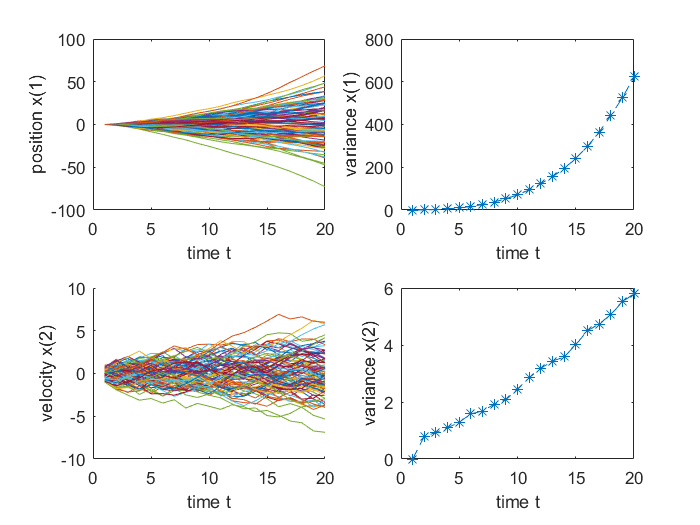
**Task 2:**

Transition matrix:

The 100 realizations with 20 time steps are obtained by

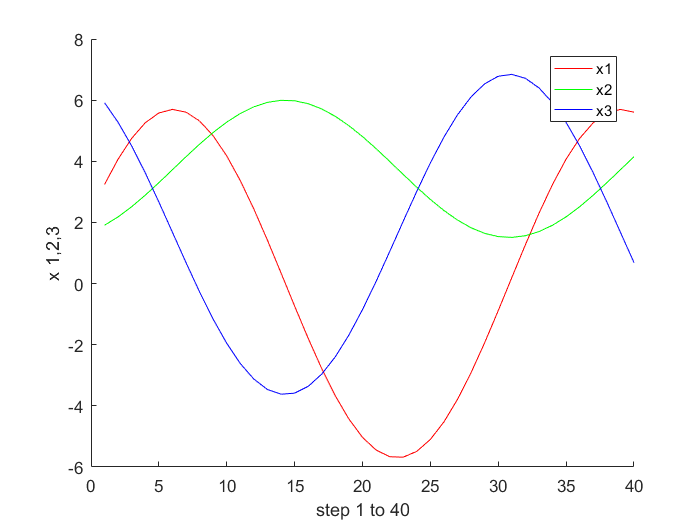
, n = 1:20,

where *w* is a noise value from the text file *random02.txt.*



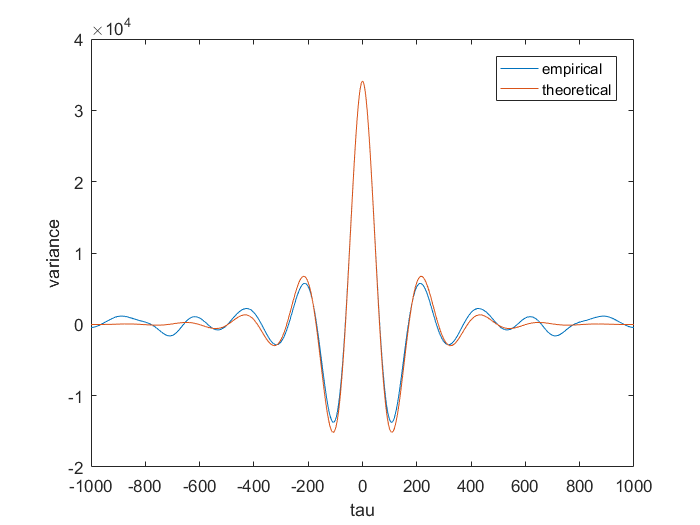
**Task 3:**

Transition matrix: Phi = expm( F \*dt)



**Task 4**

Transition matrix: Phi = expm(F\*dt)



f -> 1, it degenerates into GMP1 with a pure exponential decay.

f -> 0, leads to a pure sinusoidal oscillation.