

ALGORITHMS TO PROGRAMS IN SCILAB

Algorithm of simulation

Initial settings

- length of simulation
- parameters of model for simulation
- initial values of data

Time loop

for i beg **to** end

- generation of the input
- construction of regression vector
- generation of the output (with noise)

end

Results

- show graph of input and output

Algorithm of estimation

Initial settings

- length of simulation
- parameters of model for simulation
- initial parameters for estimation
- initial values of data

Time loop

for i beg **to** end

- generation or reading of actual data
- construction of extended regression vector
- update of statistics
- construction of point estimates of parameters

end

Results

- show graph of input and output
- print final point estimates of parameters
- show graph of evolution of estimated parameters

Algorithm of prediction

Initial settings

- length of simulation
- number of steps for prediction
- parameters of model for simulation
- initial parameters for estimation
- initial values of data

Time loop

for $i = \text{beg}$ **to** end

- generation or reading of actual data
- parameter estimation + point estimates construction
- generation of regression vector
- prediction of actual output (yy)

Loop for prediction

for $j = 1$ to np

- setting time for prediction $tj = t + j$;
- generation of shifted regression vector (at tj)
- prediction of actual output (yy at time tj)

end

- final prediction for time $t + np$ is the last yy

end

Results

- show graph of input and output
- print final point estimates of parameters
- show graph of evolution of estimated parameters

Algorithm of filtration

Initial settings

- length of simulation
- parameters of regression model for simulation
- initial values of data
- initial guess for covariances (state and output model, state estimates)
- construction of state-space model parameters

Time loop

for i beg **to** end

- calling of Kalman filter

end

Results

- show graph of input and output
- print final point estimates of parameters
- show graph of evolution of estimated parameters