DEE TUTORIAL

Objective:

Solve the following ODE using DEE block of Simulink

$$\frac{dx}{dt} = -x + u \quad x(0) = 0$$

where u is a step input.

Solution

To open a DEE window, type in MATLAB Command Window:
>> dee
To get started, drag and drop the " Differential Equation Editor" from the DEE window onto a new Simulink model.

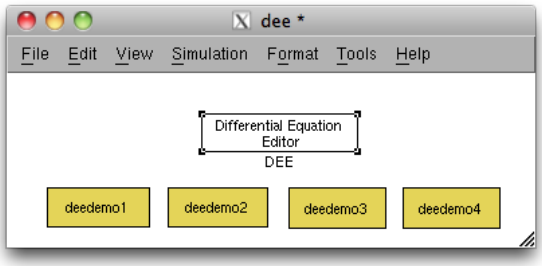


FIGURE 1. DEE window

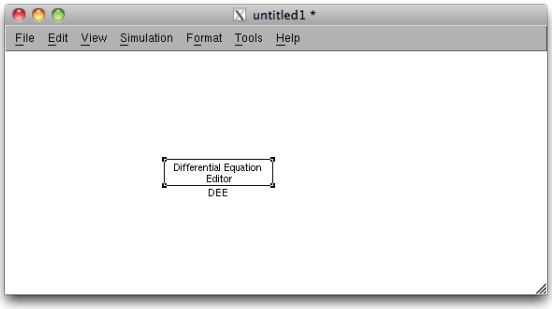


FIGURE 2. New Simulink model

Double click on the DEE block and type in the equations, specify number of inputs and initial conditions and the outputs in the appropriate boxes and press “done”.

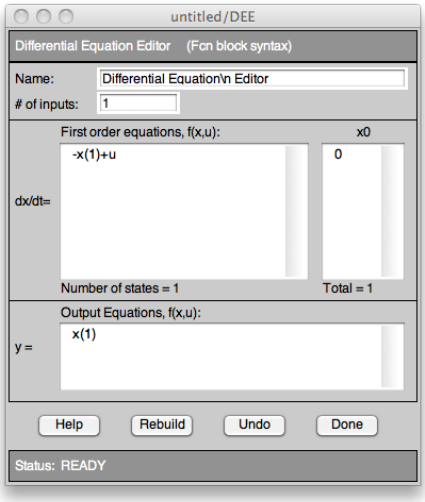
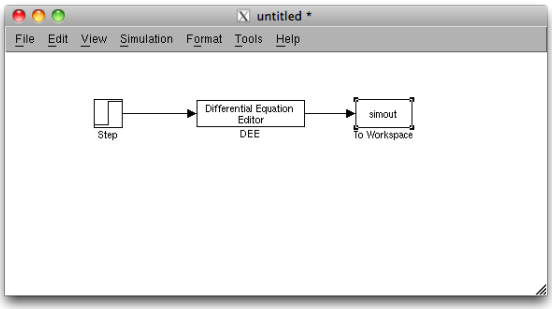


FIGURE 3. DEE block settings

Now you can add any input block and output block that is needed. In order to plot the outputs, you can add a “to workspace” block which can be found under “sources” in library browser. After double clicking on the block you can change the name of the variable you want to export. Make sure that the format of output is changed to “Array” (under “save format”). After running the simulation, variables will be exported to the workspace and you can plot them by using “plot” command. (a variable named “tout” will be exported which is actually simulation time)



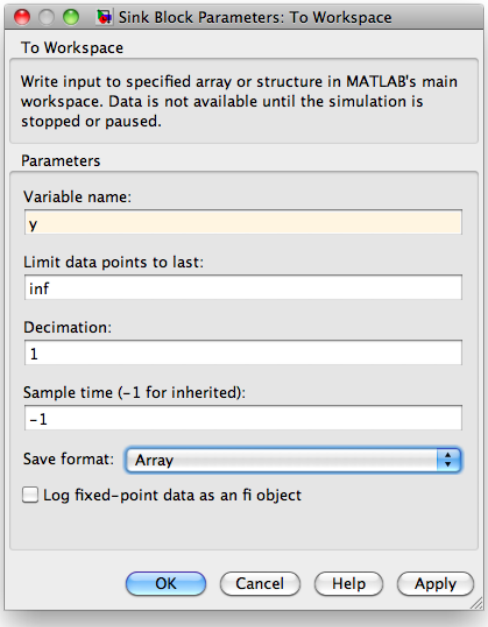


FIGURE 4. to workspace block settings