Department of Chemical Engineering
University of California, Santa Barbara

ChE 152B **Winter, 2010**

Lab 1: Model Development

Instructions for operation of pendulum simulation

IMPORTANT: FOLLOW THIS SEQUENCE OF EVENTS FOR EVERY PENDULUM SIMULATION

1. Open .mdl file in MATLAB (type the name at the command prompt)
2. Compile the model (CTRL + B)
3. Switch the power ON to the box
4. Connect to target in Simulink (Simulation → Connect to target)
5. Press START on the box
6. Start the simulation (Simulation → Start the real-time code)

SAVE ALL YOUR INTERMEDIATE DATA.
BACKUP YOUR DATA IN THE DESKTOP FOLDER WITH YOUR GROUP'S NAME

1. Run the CartIdent simulation (type CartIdent at the command prompt)
2. Run the simulation as per the above instructions
    a. Double-click on the simout block, to ascertain the sampling period
3. Detrend and assign the output data
    a. u=detrend(simout(:,3));
    b. y=detrend(simout(:,1));
4. Run the system identification toolbox (type ident at the command prompt)
    a. Select Import data → Time domain data
    b. Specify the workspace variables (u, y) and the sampling period (0.05)
    c. Specify the start time as 0
    d. Drag the data into the Working Data box
    e. Select Estimate → Parametric Models
    f. Choose your model type and order
    g. Select Estimate
5. Drag the created model to the "To Workspace" box

NOTE: For exercise 6, you should only use the data collected when the pendulum is inverted, hence you should ignore the first half of the data collected