

ECE 257 - LESSON 25
INTRODUCTION TO SIMULINK - PART II

SPRING 2007

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IN CLASS

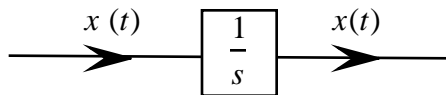
1. Drag a gain block to the model window
 - a. Resize the gain block by selecting it and then dragging on one of the handles
 - b. Rotate the gain block by 90 degrees by selecting it and then choosing rotate from the format menu
 - c. Change a block's label by selecting the label and then typing a new one just like when changing the name of a file or folder
 - d. Hide a label by selecting the block and then choosing hide name from the format menu
2. Connect a sinusoid to the gain block in part (1)
 - a. Lines can be labeled by double clicking them. The labels can then be moved by selecting and dragging them
 - b. Text can be added anywhere in the window by double clicking
3. The objective of this problem is to model the growth of bacteria in a jar. Suppose that bacteria is being born and is dying at the following rates

$$\text{Birth rate} = bx \quad \text{Death rate} = px^2$$

where x is the amount of bacteria in the jar. Therefore the amount of bacteria in the jar is changing at the rate

$$\dot{x} = bx - px^2$$

- a. Use Simulink to obtain a graph of x if $b = 1/\text{hr}$, $p = 0.5/(\text{bacteria} \cdot \text{hr})$ for each of the initial conditions $x(0) = 1, 2, 3, 4$. Start by drawing



- b. Describe what the graphs are doing. In particular, what happens as t gets larger