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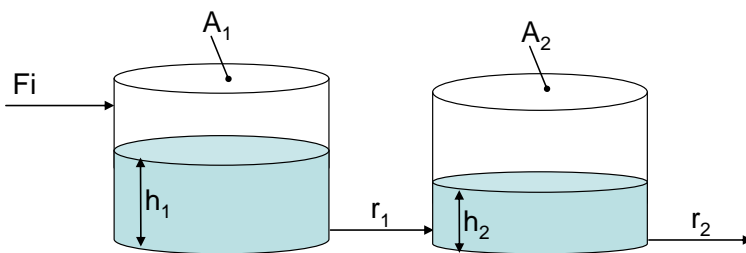
Dynamics and Control of Chemical Processes

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Lab #5 – Model Identification

Exercise 1

Consider the following interacting tanks:



Tank 1:

$$A_1 = 40 \text{ m}^2$$

$$r_1 = 0.9 \text{ s/m}^2$$

Tank 2:

$$A_2 = 30 \text{ m}^2$$

$$r_2 = 2.1 \text{ s/m}^2$$

Inlet flowrate:

$$F_i = 10 \text{ m}^3/\text{s}$$

This is a model identification problem. Determine the parameters of an ARX model, where the independent variable is the input flowrate and the dependent variable is the height of the second tank.

For the evaluation of the dependent variable, at time t , it is advisable to consider two past values of both the independent and dependent variables. In addition, the independent variable varies in the neighborhood of the stationary point with $\pm 10\%$.