

CE/CSE 5710 - Modeling and Simulation in CEE

Homework 1: Due Friday, February 6 2009

The formula “Two and two make five” is not without its attractions

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Question 1

Choose your favorite “formula” from your engineering classes and do the following:

- List and justify all assumptions made in deriving the formula
- Define the abstraction of/observations from the real system that are used to build the fundamental relationships
- Derive the formula from the above relationships
- Discuss the conditions under which the formula works and define “steady state” for the modeled system

Typical equations that you can use are: beam deflection equation, Navier-Stokes equation, boundary layer equations etc.

Question 2

Calculate the following from the data provided:

- The average delay for the first 50 customers
- The expected number of customers in the queue between 12am and noon
- The average server utilization between 12am and noon.

Question 3

From the given data plot the following charts:

- A probability distribution of the inter-arrival times
- A probability distribution of the service times

Choose an appropriate bucket size.