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CPS Quiz 2

Multiple Choice: Select one correct answer, (a, b, c, or d).

1. What would happen to the width of your 90% confidence interval if you recalculated your results using more sample data points?

a. The interval would become a 95% interval because you are more confident.

b. The interval would get wider because there is more data.

c. The interval would get narrower because there is more data.

d. The interval would not change because it is still 90%.

2. Consider that you have 2 separate sets of sample data, both observed for the same place. Each set of data has the exact same number of samples. You make separate 95% confidence intervals for the mean value based on these two separate data sets. You notice that one confidence interval is wider than the other. Why?

a. One data set was smaller than the other, so you are less confident.

b. One data set was made with a different confidence value.

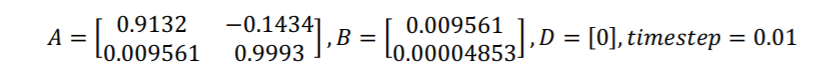
c. One data set observed a higher variation in the samples collected.

d. One data set is based on a different a value. \_

MATLAB:

1. Input-output data for C matrix given in the CPS\_Quiz\_2\_data.mat file. In MATLAB, fine the .mat file and open it to load the data to your workspace. Use the inputoutput data collected with RLSM to estimate the coefficients of the C matrix. You may use a Beta of 0.1. (For the purpose of plotting, the time-axis array you will be using is called “k”, as it was in class.)

2. Once you have the C matrix coefficients, complete the following discrete-time statevariable system and input it into MATLAB, and plot a step response of the system (ss of the 4 matrices with the timestep entered). Label the plot and show the definition of the system.



3. Convert this discrete-time state-space system into a discrete-time transfer function (ss2tf of the 4 matrices, without the timestep entered, then tf(num,den,timestamp)). Step the discrete-time transfer function of the plant and display the transfer function. Label the plot. The plot should be the same as the plot in question 2.

4. Make a model (in s, then convert to z) for this system if your desired settling time it

5 seconds and desired overshoot is 0%. Display the discrete-time model transfer function and step. Label the plot. 5. Based on the discrete-time model and the discrete-time plant transfer functions, make a discrete-time controller, H(z).

6. Convert this discrete-time controller into a difference equation based on the input to the controller and the output of the controller.