DESIGN FOR CPS SHORT COURSE
ASSIGNMENT 3: DISTRIBUTED AIRCRAFT DOOR SYSTEM

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Due date: Monday, May 30, 2022, AOE

1. Reading

(1) Lee, et al., "Quantifying and Generalizing the CAP Theorem," arXiv:2109.07771 [cs.DC], September, 2021.

2. Programming Assignment

Note: This assignment cannot be done on a Windows machine. If you are working on a Windows machine, please install a Linux virtual machine and do the assignment there. If this is not possible for some reason, let me know and work on the essay part of the assignment only.

Using your solution from assignment 2, create a federated Lingua Franca program where the `Cockpit`, `VisionMonitor`, and `Door` each run in a distinct process. You will need to redesign your keyboard entry strategy and manually run each of the components and the RTI in a separate window. Ideally, the behavior of your system will match that of the unfederated version.

A short essay: Discuss how your design will perform under network degradations, network failures, and/or component failures. What does the CAL theorem tell you about it? What is different between centralized coordination and decentralized? How can you detect failures and ensure safe operation even in the presence of failure? How should you define "safe operation"?

Specific deliverables:

(1) Your well-commented Lingua Franca program.
(2) Your essay.