Reading

Read Chapters 1 and 2 of *Access Control, Security, and Trust: A Logical Approach* (ACSTLA).

Logistics

This homework is officially due in class on **Thursday, September 5**. However, it comes with an automatic extension: anything submitted by **1pm on Friday, September 6** will be accepted as being on time.

You should work singly on this assignment.

Exercises

Note: Your proofs for the first four exercises should include enough details and explanations that a generic reader (i.e., someone who has never spent time thinking about the problem) can easily follow your reasoning.

1. (15 points) ACSTLA, Exercise 2.1.2
2. (15 points) ACSTLA, Exercise 2.1.3
3. (15 points) ACSTLA, Exercise 2.1.4
4. (15 points) ACSTLA, Exercise 2.1.5
5. (10 points) ACSTLA, Exercise 2.2.1
6. (5 points) ACSTLA, Exercise 2.2.2
7. (15 points) Consider the Kripke structure $\mathcal{M} = \langle W, I, J \rangle$, where:

$$\begin{aligned} W &= \{a, b, c, d\} \\ I(p) &= \{a, b\} \\ I(r) &= \{b, d\} \\ I(s) &= \{a, c, d\} \\ J(Al) &= \{(a,b), (a,c), (b,c), (c,d), (d,a), (d,b)\} \\ J(Li) &= \{(a,c), (b,c), (c,c), (d,c)\} \\ J(Mo) &= \{(a,a), (b,b), (c,d)\} \\ J(Ty) &= \{(a,a), (a,b), (b,d), (c,a), (d,d)\} \end{aligned}$$

   Calculate the following relations:

   (a) $J(Li \ \& \ Mo)$
   (b) $J(Li \mid Mo)$
   (c) $J(Mo \mid Li)$
   (d) $J(Al \ \& \ (Ty \mid Mo))$
   (e) $J((Al \ \& \ Ty) \mid Mo))$