Prelim is in class on Tue Oct 16.

The prelim will be based on lecture notes posted on the course web page plus readings in Smullyan First-Order Logic, specifically Chapters I, II, III only §1, IV, V only §1,2. The exam will have: definitions and short answers; requests to provide evidence for IPC formulas, simple FOL formulas; possibly requests to find errors in purported evidence terms for IPC; requests to do proofs in Refinement Logic (but not in tableau); requests to explain the significance of concepts. Here are examples of the kinds of questions.

Define the concept of an atomic proposition, e.g. P, Q, R, or the concept of an atomic predicate. What is the evidence for \( \exists x. P(x) \) assuming \( P(x) \) is atomic?

Give evidence for such and such a proposition, for example,

\[
(\exists x. Q(x) \land \forall x. P(x)) \Rightarrow \exists x. P(x).
\]

Explain why there is no evidence for some propositions, e.g.

\[
\sim (P \land Q) \Rightarrow \sim P \lor \sim Q.
\]

Provide a Refinement proof for the following formulas, e.g.

\[
P \Rightarrow \forall x. P(x),
\]

\[
\forall x. (P(x) \lor \exists x. Q(x)) \Rightarrow \forall x. (P(x) \Rightarrow \exists x. Q(x)),
\]

\[
\exists x. \forall y. R(x, y) \Rightarrow \forall y. \exists x. R(x, y).
\]

Discuss a question such as What is the added value of a constructive proof over a tableau proof? How can we explain

\[
((P \land Q) \Rightarrow R) \Rightarrow (P \Rightarrow (Q \Rightarrow R))
\]

as a programming problem.