CS1571
Fall 2019
10/16 Homework

Read Chapters 9.3, 9.4, and 9.5 of the textbook. To help you understand the content, you may find that you need to refer back to Chapter 8 or the beginning of Chapter 9. But, in class, we will be focusing our attention on these three subsections.

Then, answer the following questions.

1. (4 pts) What are some similarities and differences between the process of inference by resolution in propositional logic and inference by resolution in first order logic. Check all that apply.

   ____ You only need to convert to CNF in propositional logic.

   __X__ You need to convert to CNF in both types of logic, but the steps for doing so are different, because FOL has existential quantifiers.

   __X__ Both types of resolution involve proof by contradiction.

   ____ Both types of resolution involve the removal of literals where one is the negation of the other.

2. (2 pts) In three sentences or less, describe the most important difference between forward chaining and backward chaining algorithms with respect to how they make inferences.

   Forward chaining starts from known facts and triggers all rules whose premises are satisfied and adds those conclusions to their list of known facts and repeats this until the query is answered or the only fact left is one that is already known. Backward chaining on the other hand, chains through the rules to find known facts that support the proof and is implemented with a depth search approach. Due to these differences, forward chaining is complete and backward chaining is incomplete.

3. (4 pts) Both forward chaining and backward chaining rely on the notion of a definite clause. Which of the following English sentences can be mapped to a definite clause. Check all that apply.

____ Andy attends classes at Pitt.

__X__ Everyone who attends classes at Pitt is a student.

____ Everyone who attends classes at Pitt and is in a CS Program is a student.

__X__ Everyone who attends classes at Pitt or is in a CS Program is a student.