Middle East Technical University | Department of Computer Engineering

CENG 424

Logic for Computer Science

Fall 2023 - Homework 4

Relational Logic & Resolution

Due date: 10 December 2023, Sunday, 23:59 (No Late Allowed!)

1 Specifications

1. Your work must be on PDF file preferably outputted by a LaTeX file.
2. Your work must be of your own. This is an individual homework, no collaboration is allowed.
3. Your work must obey, of course, **zero tolerance policy for cheating**.
4. Your work must be submitted before the deadline. There is **no late submission policy**.
5. Your work must be submitted as specified in the section 3, otherwise there is a penalty of 10 points.
6. You may ask your questions by sending an email to "adhd@ceng.metu.edu.tr".

2 Questions

1. If the horse is an animal, then some stableman groom the horse. If the horse is a plant, then no stableman groom the horse. Use resolution to show that, if the horse is an animal, then the horse isn't a plant.
2. Consider the set of premises below to derive the empty clause {} using some resolution strategies.

$$T \quad \neg S \vee \neg T \vee \neg R \quad \neg T \vee R \quad S \vee \neg R$$

   (a) Derive the empty clause {} using **unit resolution**.
   (b) Derive the empty clause {} using **input resolution**.
   (c) Derive the empty clause {} using **linear resolution**.

3. Derive the empty clause {} using **ordered resolution** from the set of premises below.

$$R \vee P \vee \neg Q \quad \neg P \vee R \quad \neg Q \vee \neg R \quad Q$$

3 Submission

Please submit a PDF file named `hw4_e1234567.pdf` to gradescope.com, where 1234567 refers to your student identification number.