# **Homework 3**. Tableau Proof. Resolution.

Submit your solution in PDF file and Latex source file to blackboard by **05:00pm Mon, Oct 10**.

1. (15) For Definition 6.2, write the following information in the order they occur in the definition
   - For each concept defined by this definition, write its name and parameters (if there is any),
   - For each concept used in this definition, write its name and arguments (if there is any), and
   - Write meta variables in the definition.
2. (15) For Definition 8.4, write the following information in the order they occur in the definition
   - For each concept defined by this definition, write its name and parameters (if there is any),
   - For each concept used in this definition, write its name and arguments (if there is any), and
   - Write meta variables in the definition.
3. (15) i) Find the definition of *assignment* from Chapter 8. Write the definition below.

   ii) Write the definition of another concept, whose name contains "assignment", that was defined before (see L04).

   iii) Is it precise for us to understand *truth assignment* as the combination of the English meaning of truth and the definition of *assignment* in i)? Why?
4. (15) i) Write the result of applying the definition of *satisfiable* (see Section 2.3 of L04).

   $$\{\{\neg A\}, \{A, \neg B\}, \{B\}\}.$$

   ii) According to the result above, is the formula satisfiable? If yes, give an assignment satisfying it.
5. (20) Find a resolution tree refutation of the following formula:

   $$\{\{A, \neg B, C\}, \{B, C\}, \{\neg A, C\}, \{B, \neg C\}, \{\neg B\}\}.$$

6. (20) Prove that if the formula $S = \{C_1, C_2\}$ is satisfiable and $C$ is the resolvent of $C_1$ and $C_2$, then $C$ is satisfiable. Use our proof methodologies and format. Do not copy the proof in the book.