TDBB08 Logic with Applications Spring 1998b

Obligatory Exercise 2
Due date: April 17, 1998 at 1500

Note: These exercises are to be turned in to Petter Edblom. Do not place them in the mail shelf of Stephen Hegner, or you will risk lateness penalties.

The following data apply to problem 1.

$\Phi = \{ B \wedge \neg C, (A \vee B) \rightarrow (C \vee D) \}$;
$\varphi = A \vee D$.

1. Show that $\Phi \models \varphi$ holds, using the method of semantic tableaux. Give your solution tableau in the form elaborated in the course notes.

The following data apply to problems 2-3.

$\Phi = \{ T \rightarrow P, U \rightarrow Q, R \vee \neg Q, R \vee S \vee U, \neg P \vee \neg R, S \rightarrow (R \vee U),$
$R \rightarrow (P \vee S \vee T) \}$;
$\varphi = \neg P \wedge S$.

2. Give a resolution proof of $\Phi \models \varphi$.

3. If possible, give a resolution proof of $\Phi \models \varphi$ which is an input refutation. If such a proof is not possible, explain why.

4. Find the base of the set consisting of the following set of clauses, together with all of its resolvents.

   $\{ \neg P \vee Q \vee R, \neg Q \vee S, Q \vee \neg S, P \vee \neg Q, \neg R, Q \vee R \}$.

Note: In problems 2-3, you must convert the problem to an equivalent one which is solvable by refutation.