CSI 2101 Discrete Structures — Winter 2012
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Quiz #3

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1. **S1.5, Exercise 31:** Use resolution to show that the hypotheses:

   > It is not raining or Yvette has her umbrella.
   > Yvette does not have her umbrella or she does not get wet.
   > It is raining or Yvette does not get wet.

   imply that "Yvette does not get wet."

   Define the following propositions:

   r: It is raining.
   u: Yvette has her umbrella.
   w: Yvette does not get wet.

   Then the hypotheses translate into the following statements: $\neg r \vee u$, $\neg u \vee w$, and $r \vee w$. The rule of resolution says:

   $$[(p \vee q) \wedge (\neg p \vee r)] \rightarrow (q \vee r).$$

   We proceed to derive the conclusion using a formal proof:

Step	Reason
1. $\neg r \vee u$	hypothesis
2. $\neg u \vee w$	hypothesis
3. $r \vee w$	hypothesis
4. $u \vee w$	resoluton of 1 and 3
5. $w \vee w$	resolution of 2 and 4
6. w	

   Thus, Yvette does not get wet, as required.