CSE 321: Discrete Structures
Assignment #2
January 10, 2001
Due: Wednesday, January 17

**Reading Assignment:** Rosen, Sections 1.6, 2.3-2.5

**Problems:**

1. Section 1.3, exercise 6, parts b and c.
2. Section 1.3, exercise 10, parts b and d.
3. Section 1.3, exercise 12, parts f, i and j.
4. Give the negation of each of the following statements:
   - All good students study hard.
   - No males give birth to their young.
   - No students in mathematics are unable to use a computer.
   - $\forall x \exists y \; x = y^2$
5. Let $Q(A, B)$ be the statement $A \subseteq B$. If the universe of discourse for both $A$ and $B$ is all sets of integers, what are the truth values of the following? Justify your answers.
   - $(\forall A)(\exists B)Q(A, B)$
   - $(\forall B)(\exists A)Q(A, B)$
   - $(\exists A)(\forall B)Q(A, B)$
   - $(\forall A)(\forall B)Q(A, B)$
6. Which of the following statements are true?
   - $\{x\} \subseteq \{x\}$
   - $\{x\} \in \{x, \{x\}\}$
   - $\{x\} \in \{x\}$
   - $\{x, \{x\}\} \subseteq \mathcal{P}(\{x\})$
7. Carefully prove the following statements:
   - $(A \cup B = B) \rightarrow (A \subseteq B)$
   - $(A \cap B = A) \rightarrow (A \subseteq B)$
   - $(A \subseteq B) \leftrightarrow (\bar{B} \subseteq \bar{A})$
8. Section 1.5, exercise 38.
9. **Extra Credit:** Fuzzy logic and fuzzy sets.
   - Section 1.1, exercise 32
   - Section 1.5, exercise 50