CSCE476/876 **Spring 2003**

Homework 6

Assigned on: Wednesday April 16, 2003.

Due: Monday April 28, 2003.

Pen and paper, should be returned in class. Total value 120 points.

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1. AIMA, exercise 6.1 — 10 points.
2. AIMA, exercise 6.3 — 10 points.
3. AIMA, exercise 6.7 — 10 points.
4. AIMA, exercise 6.8 — 10 points.
5. AIMA, exercise 6.9 — 10 points.
6. AIMA, exercise 6.12 — 10 points.
7. Axioms in FOL *(Adapted from AIMA, exercise 7.6)* — Total 15 points.

   Using the following:
   `Child(x,y)`, `Sibling(x,y)`, `Female(x)`, `Male(x)`, and `Spouse (x, y)`:

   - (10 points) Write axioms describing the predicates: `GrandChild`, `GreatGrandParent`, `Brother`, `Sister`, `Daughter`, `Son`, `Aunt`, `Uncle`, `BrotherInLaw`, `SisterInLaw`, and `FirstCousin`. We want these axioms to be definitions, so use $\Leftrightarrow$ instead of $\Rightarrow$.
   - (5 points) Knowing that a second cousin is a child of one's parent first cousin, write the definition of a N^{th}`-cousin`, as a recursive expression in terms of the predicates defined above. Hint: Let N^{th}`-cousin` be a ternary predicate, that takes as input n, and two persons p_1 and p_2.

8. AIMA, exercise 7.9.
   Questions a, b, and c.
   Five (5) points per question — Total 15 points.
9. AIMA, exercise 7.11
   Five (5) points per question. — Total of 30 points.