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**CS 451**  
**Programming Assignment #5**  
**Logic Programming**  
**Prolog**

Due 11/16/09, by 6:00am sharp!

**Introduction**

The goal of this assignment is to get acquainted with the programming language Prolog. Write two Prolog programs.

- (1) For the first, suppose that sets are represented in Prolog as lists, where each element of the set appears *exactly* once in its list. Write Prolog relations for the following operations: set union, set intersection, and set difference.
- (2) For the second program, solve the magic square problem. In a magic square, the sum of the values in the rows, columns, and diagonals are all the same. Each square is assigned a single digit number and each digit can be used exactly once. Write a Prolog program to find magic squares of size three by three.

I suggest you use the generate and test design pattern. That is, first generate a permutation of the numbers 1,2,..., 9 and then test if that permutation is a solution to the magic square problem.

**What to hand in**

- (1) For Program 1, email a listing of your program and the output from each relation's execution on some test queries that you feel fully test your code. (**Send a simple text message.**)
- (2) For Program 2, email a listing of your program and its output. (**Send a simple text message.**)