Homework 2

Due Date: April 19, 2001
Points: 100

1. (20 points; text, exercise 1.3) The aphorism “security through obscurity” says that hiding information provides some level of security. Please give an example of a situation in which hiding information does not add appreciably to the security of a system. Give an example when it does.

2. (20 points; text, exercise 2.5) Let \( c \) be a copy flag and let a computer system have the set of rights \{ \( r, w, x, a, l, m, o \) \}.  
   a. Using the syntax in class (and in section 2.3 of the text), write a command \( \text{copy\_all\_rights}(p, q, s) \) that copies all rights that \( p \) has over \( s \) to \( q \).
   b. Modify your command so only those rights with an associated copy flag are copied. The new copy should \( \text{not} \) have the copy flag.

3. (40 points; text, exercise 3.1) Prove or give a counterexample:
   The predicate \( \text{can\_share}(\alpha, x, y, G_0) \) is true if and only if there is an edge from \( x \) to \( y \) in \( G_0 \) labelled \( \alpha \), or if the following hold simultaneously:
   a. there is a vertex \( s \in G_0 \) with an \( s \)-to-\( y \) edge labelled \( \alpha \);
   b. there is a subject vertex \( x' \) such that \( x' = x \) or \( x' \) initially spans to \( x \);
   c. there is a subject vertex \( s' \) such that \( s' = s \) or \( s' \) terminally spans to \( s \); and
   d. there is a sequence of subjects \( x' = x_1, \ldots, x_n = s' \) with \( x_i \) and \( x_{i+1} \) being connected by an edge labelled \( t \), an edge labelled \( g \), or a bridge.

4. (20 points; text, exercise 4.5) Classify each of the following as examples of mandatory, discretionary, or origina- tor controlled policies, or a combination. Please justify your answers.
   a. The file access control mechanisms of the UNIX operating system.
   b. A system in which no memorandum can be distributed without the author’s consent.
   c. A facility in which only generals can enter a particular room.
   d. A university’s registrar of fi- ce, in which faculty can see grades of a particular student provided that student has given written permission.