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 *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 *not* have the copy flag.

3. (*40 points*; text, exercise 3.1) Prove or give a counterexample:
   The predicate *can•share*(α, **x**, **y**, G_0) is true if and only if there is an edge from **x** to **y** in G_0 labelled α, or if the following hold simultaneously:
   a. there is a vertex $\boldsymbol{s} \in G_0$ with an **s**-to-**y** edge labelled α;
   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 $\mathbf{x´} = \mathbf{x}_1, \ldots, \mathbf{x}_n = \mathbf{s´}$ with $\mathbf{x}_i$ and $\mathbf{x}_{i+1}$ ($1 \le i < n$) 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 originator 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 office, in which faculty can see grades of a particular student provided that student has given written permission.