There is a mistake in the *hint* given in question 1 of chapter 3. The mistake in the hint makes part b particularly difficult. Below is the correction.

Tom

1. Consider the class C of concepts of the form $(a \leq x \leq b) \wedge (c \leq y \leq d)$, where a, b, c, and d are integers in the interval (0, 99). Notice each concept in this class corresponds to a rectangle with integer-valued boundaries on a portion of the x, y plane. (hint: given a region in the plane bounded by the points $(0, 0)$ and $(n-1, n-1)$, the number of distinct integer-valued rectangles within this region is $(\frac{n(n-1)}{2} + n)^2 = (\frac{n(n+1)}{2})^2$.)

   (a) Give an upper bound on the number of randomly drawn training examples sufficient to assure that for any target concept c in C, any consistent learner using $H = C$ will, with probability 95%, output a hypothesis with error at most .15.

   (b) Generalize the class C from two dimensional rectangles to the class C', consisting of hyper-rectangles in d dimensions. Still assume that the values along each dimension range from 0 to 99. Show that the concept class C' has sample complexity that is polynomial in $1/\delta, 1/\epsilon$, and d.

   (c) Devise a learning algorithm, L, such that C is PAC-learnable by L, and prove that it is.