# Applied Math 120

**Assignment 4, 24 February 2005, due 3 March, 2005.**

Do the following problems from H & L.

- pp. 762-763, problems 16.6-1, 16.6-4.

In addition, do the following.

1. Generalize the construction you did in the last homework for simulating a Markov chain with 3 states and a specific transition matrix. Suppose you were given an infinite sequence of iid random variables $U_0, U_1, \ldots$, that are uniformly distributed on $[0, 1]$, and $m \times m$ probability transition matrix $P$, and an initial condition $i^* \in \{1, 2, \ldots, m\}$. Describe an algorithm for generating simulations from this chain.

2. Let $\{X_n\}$ be a finite state Markov chain, and let $f$ be a deterministic, real-valued function defined on the state space of the chain. Is $\{f(X_n)\}$ a Markov chain? Does the answer to this question depend on $f$?