ECE 537 - Foundations of Computing
Prof. Sen
Homework #9
Due: Thursday, November 15, 2007 in class

1. Problem 17.2-2 in the Cormen et al. text.

2. Problem 17.3-3 in the Cormen et al. text.

3. We can generalize the analysis of the MTF algorithm provided in a class lecture by considering what happens when the MTF algorithm moves an accessed element some fixed fraction of the way towards the head of the list, instead of all the way to the head of the list. Specifically, prove that if $MTF(d)$ $(d \geq 1)$ is an algorithm which takes an element at position μ and moves it $p = \lceil \mu/d \rceil - 1$ elements closer to the front of the list after a *Search* or *Insert* operation, then

$$\sum_{i=1}^{m} c_i^{MTF(d)} \leq d \left(2 \sum_{i=1}^{m} c_i^A + X^A - F^A - m \right)$$

   where A is any self-organizing list algorithm that obeys the other assumptions given in class. Note that when $d = 1$, this reduces to the analysis provided in the lecture.