Assignment 1

CSE 326: Data Structures and Algorithms

Autumn Quarter, 1999, University of Washington.

Steven Tanimoto, Instructor

Due Wednesday, October 6.

1. Problem 1 on page 36 of Lewis and Denenberg. (A couple of sentences in English will be acceptable for describing the solution to this problem; pseudocode is not necessary.)

2. Write a procedure `LLDelete` that can serve as the counterpart to `LLInsert` of Algorithms 1.5 and 1.6 on pages 13 and 14. Write two versions of the procedure, the first without locatives (similar to Algorithm 1.5) and the second using locatives (similar to Algorithm 1.6).

3. Problem 11 on page 38 of Lewis and Denenberg.

4. Problem 21 on page 39 of Lewis and Denenberg.

5. Fill in the table below. Each row gives a function of n that describes the running time of some program as a function of the n, which represents the size of the input. Each column gives an amount of time. Each entry in the table will give the maximum input size n for which a program with the given running-time function can run to completion in the time available. Some of the entries are large and can be approximated. Feel free to use a calculator. If you like, write a small program if you think it would help.

	1 second	1 minute	1 hour	1 day	1 month	1 year
$50 \log n$						
$50n$						
$10n \log n$						
$8n^2$						
n^3						
$0.1 \cdot 2^n$						

6. Consider the procedure below. Suppose that its running time is given by the function $T(n)$. Find a function $f(n)$ such that $T(n) \in O(f(n))$. Justify your answer.

```
procedure loopForAWhile(integer n):
    x ← 0;
    for i from 1 to n do
        j ← 1;
        while j < n
            x ← x + 1;
            j ← j * 2;
```