Algorithms — Homework 7
Hashing

Due: October 27.

1) Insert the following numbers in an empty hash table of size 19.

$$22 \quad 80 \quad 18 \quad 9 \quad 90 \quad 12 \quad 22 \quad 57 \quad 86 \quad 36 \quad 32 \quad 88 \quad 20 \quad 6 \quad 62 \quad 24$$

   (a) Use chaining and the hash function $h(k) = k \bmod 19$.
   (b) Use open addressing with the hash function $h(k, i) = \big((k \cdot 181) + (i \cdot k \cdot 113)\big) \bmod 19$.

2) You have given two arrays A and B. Create two lists D and S such that S contains all the singles (i. e., numbers only in A or only in B) and D contains all the doubles (i. e., numbers in A and in B). Your algorithm should run in linear time.

3) Your are given an array A of numbers and a number k. Note that A is not necessarily sorted. Find two numbers $x, y \in A$ such that $x + y = k$. Your algorithm should run in linear time.