

Module IN2002—Data Structures and Algorithms

Exercise Sheet 6

1. Demonstrate the insertion of the keys 5, 28, 19, 20, 33, 12, 17, 10 into a hash table of 9 slots. The hash function is $h(k) = k \bmod 9$, and collisions are resolved by chaining. How much difference would it make if the keys were presented in a different order?
2. Demonstrate the insertion of the keys 5, 28, 19, 15, 17, 20, 16 and 30 into a hash table of 11 slots, with hash function $h(k) = k \bmod 11$, and collisions resolved by open addressing, using a) linear probing, and b) quadratic probing. What are the average and worst cases for search?
3. Write `delete` for a hash table with chaining.
4. Suppose we have a hash table of size m , with hash function $h(k) = k \bmod m$, and with collisions resolved by chaining. Suppose further that all the keys we will insert divide evenly by 4 (for example, they are pointers on a certain architecture). What happens if m is 20? 19? 18? In general, which values of m give better performance?