Home Work 2.
Algorithms and Data Structures

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April 2003

HW2.1 Write an iterative version of RANDOM-SELECT (that is: use loops and do not use recursive calls).

HW2.2 Explain how DETERMINISTIC-SELECT can be used in QUICK-SORT so to have sorting in worst case time $O(n \log n)$.

HW2.3 Change counting sort so that it sorts in place (that is without an output array) using only O(k) extra storage, besides the input array.

HW2.4 use radix sort to sort n numbers in the range $[0..n^2 - 1]$ in time $O(n)$.

HW2.5 Write pseudo-code for the operations on the disjoint set data structure:make-set, find-set and union. Use linked lists and weighted union rule.

HW2.6 How an hash function can help you to speed up searching in a list where each element of the list stores a very long string of characters?

HW2.7 Suppose you have a table with 9 slots, the hashing function $h(k) = k \ mod \ 9$. Show the status of the Hash table with chaining after inserting keys : 5, 28, 19, 15, 20, 33, 12, 17 and 10.