ADVANCED DATA STRUCTURES

HOMEWORK 2 (Sorting)

Announced: 02.11.2011

Due: 15.11.2011 23:00 via Ninova system (late hws not accepted!)

If you have any questions please email nilhan@itu.edu.tr

1) You will read files (data1.txt,data2.txt,data3.txt) of records into a table, then sort (decreasing) the records using:
-[20 points] Quicksort Algorithm
-[20 points] Insertion Sort Algorithm
-[20 points] Radix Sort Algorithm
Sample output file is given below:

Output file (quicksort.txt/ insertionsort.txt/radixsort.txt):

```
1000    to
999     dedicated
998     here
997     be
996     to
995     us
994     for
993     rather
992     is
991     It
990     advanced.
....
```

Call the sorting routines to sort the table by number and save the resulting outputs to the corresponding output files (quicksort.txt/insertionsort.txt/radixsort.txt).
Compare the running times of the algortihms *(run each algorithm 1000 times, report the sum in ms)* and memory spent for each of the datasets and write the results into your report.

2) ***HeapSort:*** Write a program which takes input of integers from input file (input.txt), prints the resulting MIN-heap into the output file (output.txt) and does heapsort and prints the sorted integers into file sortedoutput.txt. Construct heap by inserting integers from input file.
Sample input.txt file:

14 29 -3 64 13 56 0 72 41 92 29 46 31 65 10

Sample ouput.txt file: Sorted -3 0 10 13 14 29 29 31 41 46 56 64 65 72 92

Compare the running times and memory used by heapsort to the sorting algorithms in Q1.

NOTE: Implement your codes using C/C++.