Radomized Algorithms: Assignment Fall 2018.
To hand before **Dec 13th**

In the lectures, we have seeing two randomized algorithms for finding the median of an input array of unordered keys: QSelect and RMedian. You should do an empirical comparison of the computer time that needs each algorithm to find the median. to find the mean. You also should compare with the algorithm consisting of sorting the input and after going to position $\lceil n/2 \rceil$. For sorting you can use any comparison algorithm.
In particular you have to do:

1. Using your favourite programming language, write (or retrieve as a function from the net) programs for QSelect and RMedian. Also write or retrieve from internet, Quicksort or Merge-Sort or any other sorting algorithm.

2. Generate at lest 100 instances of an input consisting of an 50000 integer array, each integer within a range of at least three digits, (some of those instances should be randomly generated, others could be ad-hoc to try forcing good or bad behaviour of the algorithms).

3. To each instance, you should apply the three algorithms and count the computing time.

4. (Optional) It would be nice to have a comparative plot of the complexities, for different values of n.

5. You should hand to me a report stating your conclusions: Which algorithm is faster (recall both of them are $O(n)$ is expectation, and quick sort is $O(n \lg n)$ on average). Which algorithm is more reliable. This report could be written in LaTex, in word or by hand. It should be between 2 and 5 pages.

6. Either you e-mail me (diaz@cs.upc.edu) your code, the input (the 100 arrays) or put it in a web page from where I can retrieve it

7. Deadline to hand the assignment: The 26th of November.