Striving for Efficiency in Algorithms: Sorting

Notes to the instructor

The project is designed for a junior level Data Structures and Algorithms course. It is based on the paper by R. Sedgewick “Implementing Quick sort Programs”. In the paper Sedgewick presents a practical study of how to implement the Quick sort sorting algorithm and its best variants on real computers”. The paper contains the original version of Quick sort and its modification, which as Sedgewick says combines the most effective improvements to Quick sort. The main idea of the project is to experimentally verify results of Sedgewick by implementing the algorithms and comparing their running times.

The project allows students to learn and practice Quick sort, insertion sort, recursive thinking, using implicit stack data structure to remove recursion, computing running times of algorithms, etc. The project is divided into three parts. Each part contains a reading assignment and a list of tasks.