

Advanced Data Structures (Jan-Apr 2012)

Overview of the Course

Data structures play a central role in modern computer science. In a typical data structure problem, one is interested in storing some data to support fast queries and/or updates using little space. The course will cover recent developments in the subareas including, but not limited to,

- self adjusting data structures (these are structures that store no balance information, are easy to implement, but harder to analyze)
- hashing
- succinct data structures
- data structures optimized for external memory and cache-oblivious data structures
- data structures for dynamic graph problems

We will follow closely the outline of topics covered in a course with the same title at MIT (<http://courses.csail.mit.edu/6.851>).

Prerequisites and Requirements for those crediting

A course in algorithms and data structures is the recommended prerequisite.

Those crediting the course will be required to

- scribe (three or four depending on the class size) lectures. Use the LaTeX template provided in the website. This involves filling up the missing details (sometimes referring to the original source) and writing complete coherent notes. A preliminary draft of the notes should be mailed to me by 9pm the day after the lecture (so that the participants can refer to it before the next lecture). The final version is due a week after the lecture;
- submit solutions to short assignments given from time to time (expected number = 4), and
- do a project that involves
 - reading several papers on a topic, or
 - performing some experiments related to a topic, or
 - working on an open problem, or
 - any combination of the above.

In all cases, the participants crediting are expected to write a report summarizing the findings and give a presentation (for up to 45mins).