CS 602 Applied Algorithms

Nutan Limaye

Indian Institute of Technology, Bombay
nutan@cse.iitb.ac.in

Algorithms for Large Data

January 03, 2014

Course Prerequisites

No pre-requisites enforced at the registration level.

However, instructions assume working knowledge of the following topics:

Course Prerequisites

No pre-requisites enforced at the registration level.
However, instructions assume working knowledge of the following topics:

- Linear algebra
- Probability theory
- Combinatorics
- Data structures
- Design and analysis of algorithms

Course Outline

The course focuses on designing algorithms for large data.

Course Outline

The course focuses on designing algorithms for large data.

Basic assumptions about the model:

- The input data is very large as compared to the space available to the algorithm.
- Rereading input bits is very expensive.
- Time for computation per input bit is very small.

Course Outline

The course focuses on designing algorithms for large data.

Course is roughly divided into four modules:

- Algorithms for large datasets – computing properties of the data such as frequently occurring elements, distinct elements, frequency moments, ...
- Algorithms for problems in linear algebra – dimension reduction, norm computation, ...
- Algorithms for large graphs – computing distances, computing matchings, ...
- Information theory for proving lower bounds.

Course Outline

The course focuses on designing algorithms for large data.

Course is roughly divided into four modules:

- Algorithms for large datasets – computing properties of the data such as frequently occurring elements, distinct elements, frequency moments, ...
- Algorithms for problems in linear algebra – dimension reduction, norm computation, ...
- Algorithms for large graphs – computing distances, computing matchings, ...
- Information theory for proving lower bounds.

For more details check www.cse.iitb.ac.in/∼nutan/cs602.html

Course Expectations

This is a research level course.

Course Expectations

This is a research level course.

As part of the course, you are expected to do the following:

- read research papers.
- scribe lecture notes.
- solve in-class and homework assignments.
- submit a survey project (groups of 3-4).