Data Structures Algorithms:
(Slides to be Adopted from Goodrich and aligned with Weiss' book)

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http://www.cse.iitb.ac.in/~cs213m/
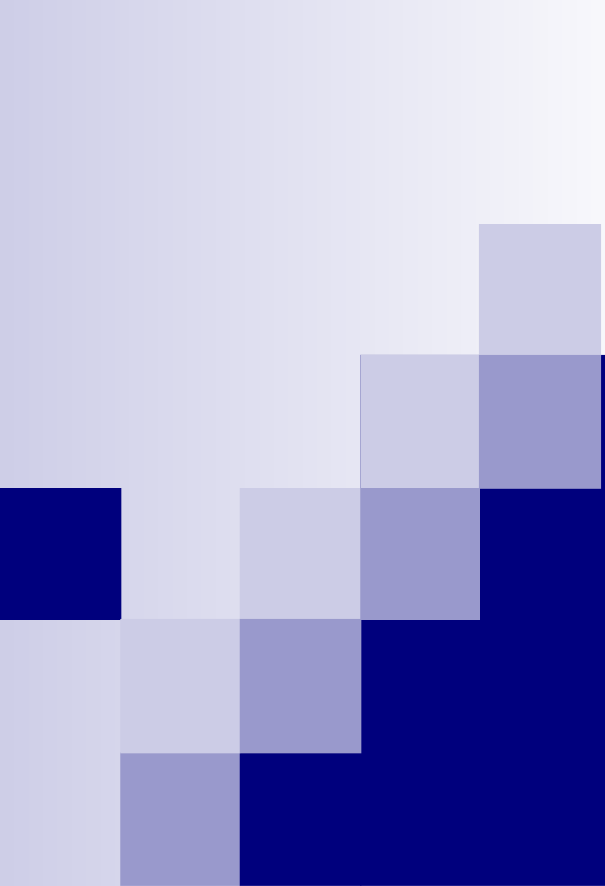
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What is the course about?

- Learning to represent data required for a program in a proper *structure* <u>and</u> designing an *algorithm* that *uses* this structure such that
  - Program runs fast
  - Program uses minimal memory
- E.g. consider an online dictionary –
  - How should we store the words?
  - What is the fastest way to search for the meaning of a word?
- E.g. Routing in Maps
  - How should we represent the Map?
  - How should we find the route?

…What is the course about

- You will learn about various known *data structures*
  - You will learn how to *use* the right one for your application
  - You may also develop your own data structures
- You will learn various *algorithms* for common problems
  - You will develop your own algorithms (in homeworks, exams)
- You will learn how to *analyze* these algorithms for efficiency

This course is the *heart and soul of Computer Science*

Very critical prerequisite, all subsequent CS courses depend on this course

Specifics

The rules, policies etc

Attendance

- Compulsory
  - This allows me to get a mental picture of each student
- Each class will begin with discussion of a homework problem
  - Students exchange their answers
  - TA will choose a student to present the answer
  - will put pressure to attend classes.

Evaluation Scheme (CS 213m)

(Tentative – subject to change)

- 1 "mid-sem"
  - 20%
  - Two hours
- 1 end sem of 40% weight.
- 5 % for class participation
- 20 % for homework assignments and final project
- 15 % for quizzes (best two of three quizzes used for grading.)
- Dates of quizzes:
  - 29th January, 8:30-9:25 AM
  - 12th March 8:30-9:25 AM
  - 2nd April 8:30-9:25 AM

Homework

- Given frequently: Mix of reinforcement & creative problems
- Class divided into 10 focus groups
- Each homework will be assigned to one *focus group*
  - Will not be graded but compulsory to be done (Will be counted in class participation marks)
  - Solutions to be given by focus group on class discussion forum: *piazza*
    - All members of the focus group should post answers (for enthusiasm mark credit)

Introduction to *Piazza*

- Class discussion forum website
- But much, much more than an unstructured discussion forum
- Sort of like a "facebook group", but customized for class interaction

…*Piazza*

- Instructors can post "questions" (and announcements)
- Students can post solutions
- Other students can improve on solutions posted by others or mark them as "good"
- Instructor can improve on solutions posted by others (or mark them as "good")

…*Piazza*

- **Students can post questions**
  - Can do so with name or anonymously also
  - Instructor can answer
  - Other students can mark it as "good question"
- **Instructor sees record of online activity by students**

…Piazza

- I will encourage the use of Piazza in a big way for this class!! I will
  - redirect e-mails to me which are of general interest to Piazza
  - Put homework problems on Piazza which must be solved by a focus group
  - However, I will use moodle for e-mail announcements

"Enthusiasm"

- Active class attendance
  - Answering my questions
  - Asking doubts/questions
  - Making useful comments
  - Sitting attentively near the front benches
- Interacting with me outside class (in my office hours)
- Active on Piazza
  - Important for those who are just shy speaking up in a class

Summary about online course resources

- "Permanent stuff" on moodle: All slides, other files, important instructions, lecture schedules.

- "Temporal stuff" - "discussion" type activity, question/answers, or announcements, on Piazza.