

CSE 21

Lecture 1: Introduction

Instructor: Sourav Chakraborty

TAs and Tutors

- Instructor:
Sourav Chakraborty (chakraborty.sourav@gmail.com)
- TAs:
 - ① Balasundaram Radheshyam (rbalasun@ucsd.edu)
 - ② Lawrence Shibu Stanroop (sslawren@ucsd.edu)
- Tutors:
Will be announced next class

Classes

- Lecture: Mon, Wed, Fri 10AM-10:50AM (WLH 2005)
- Discussions: Wed 3PM-3:50PM (CENTR 115)
- Office Hours:
Instructor office hour: by appointment
Other office hours to be announced in next class.

Evaluation Process

- Assignments (no marks)
- Quizes
 - Around 6 quizzes.
 - 5% each.
 - Everything will be done on WeBWork.
 - 1st Quiz will be posted on the 10th Jan.
- MidTerm 30%.
- Endterm Term 40%.

Books and references

Textbook for the course is

- Mathematics for Algorithms and Systems Analysis, by E.A.Bender and S.G.Williamson

Also one may refer to the following books:

- A short course in Discrete Mathematics, by E.A.Bender and S.G.Williamson
- Lists, Decisions and Graphs, by E.A.Bender and S.G.Williamson

<http://cseweb.ucsd.edu/~gill/BWLectSite/>

- Essentials of Discrete Mathematics, by David Hunter.

Course Outline

Mathematics for Algorithms and Systems Analysis:

- Induction
- Basic Counting
- Functions and Probability
- Decision Tree
- Graph Theory

Objects we encounter

What all things we encounter in Algorithms and System Analysis?

Numbers

- Integers

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- Whole numbers

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- When one represents a number in base 2 it is called binary representation or **Boolean Representation**.

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- Operations:
AND ($\wedge$), OR ($\vee$), NOT ($\neg$) and XOR ($\oplus$).

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- Ordered Sets

(Also called LIST/STRINGS/VECTORS)

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- $\{0, 1\}^n$ the set of all “strings” of 0 and 1 of length n .

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For example:

$f : \{0, 1\}^n \rightarrow \{0, 1\}$ such that
 $f(x) = 1$ iff x has even number of 1.

A little bit of counting

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Ans: 2^{2^n} .