GB13624 - Maths for Computer Science

Lecture 0 – About this Course

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What is this course about?

In this course, you will study (or review?) topics in fundamental mathematics that are useful for computer scientists.

- Central topic: Discrete Mathematics
  - Proofs
  - Sets
  - Integers
  - Combinations
  - Probability
- Theoretical version of "Programming Challenges"?

A secondary objective of this lecture is to help you practice your technical English.

Course Materials

This course is based on Mathematics for Computer Science, Spring 2015, by Albert Meyer and Adam Chlipala, Massachusetts Institute of Technology (MIT), OpenCourseWare (OCW)

In manaba you can find links to the original course, as well as the textbook.
Make sure to read the textbook along with this course!

Structure of a Lesson

1. Learn this week's topics;
   - Please ask lots of questions in class!
2. Present the weekly homework;
   - Start working on the weekly homework;
   - You can ask questions about the homework in class;
3. Submit the homework on manaba

End time

If you have finished the homework, you may leave the class early.

Course Topics

- Part I: Proofs
  - Class 1: Introduction to Proofs
  - Class 2: Sets and Induction
- Part II: Structures
  - Class 1: Number Theory
  - Class 2: Directed Graphs and Partial Orders
  - Class 3: Simple and Planar Graphs
- Part III: Counting
  - Class 1: Sums and Assymptotics
  - Class 2: Cardinality Rules and Generating Functions
- Part IV: Probability
  - Class 1: Events, Probability Spaces, Conditionals
  - Class 2: Random Variables, Deviation from Mean, Random Walk
  - Class 3: Advanced Topics and Review

Course Evaluation

Online Version

The grade of this course will be the weighted average between the Weekly Exercises and the Final Exam.

- 70% Weekly Exercises
  - One to three questions will be posed in class;
  - You must answer your exercises individually;
  - Submission must be a PDF on MANABA;
- 30% Final Exam
  - The final exam will cover topics from all lectures;
  - The final exam will probably be Face to Face; Let me know if you have problems.

About the Course Language

One of the goals of this lecture is to raise your level of technical English. However, this is not an English Class.

I expect the students to submit their exercises and exam answers in English. It does not need to be perfect, but I expect you to make a good effort.

If you are having difficulties

Please contact me by MANABA message, MS Teams, or by e-mail at any time!

Self-introduction

- Name: Claus Aranha;
- Country: Brazil;
- Research: Evolutionary Computation and Artificial Life;
- Hobby: game programming
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