INTRODUCTION TO DISCRETE MATHEMATICS AND ALGORITHMS (IDMA)

A course about

DISCRETE MATH

- numbers, logic, graphs, combinations
- NOT continuous functions, derivatives, integrals et cetera

Mathematics

- Start from obvious facts (axioms)
- Derive true facts from these axioms
- We won't give fully axiomatic treatment (far from it), but will stress rigorous reasoning
- In mathematics, we derive absolute truth – very different from other fields of science, where there are hypotheses and experiments

ALGORITHMS

- Our computational problems have concrete, correct answers (not about ML predictions)
- Algorithms are precise descriptions of automated methods for solving such problems (focusing on discrete objects)
- Can be coded up in different programming languages (but we won't do programming in this course)

PRO TIP

- Read course material before lectures
- Maybe even watch online videos for challenging topics

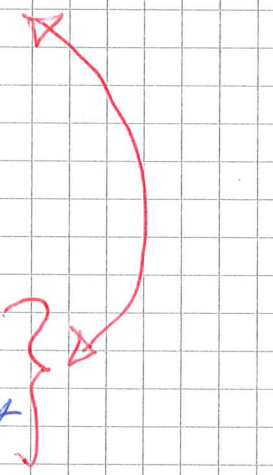
COURSE CONTENTS

MATHEMATICS

- definitions of important concepts
- theorems
- proofs
- develop your abilities for rigorous (but creative!) reasoning

ALGORITHMS

- (pseudo) code
- proofs of correctness
- analysis of efficiency / complexity



LECTURER

JAKOB NORDSTRÖM, PROFESSOR
ALGORITHMS & COMPLEXITY SECTION
DEPARTMENT OF COMPUTER SCIENCE (DIKU)
Also at Lund University in Sweden

Research on:
- Proving that really hard problems are really hard
- Solving them as fast as possible anyway
- Producing auditable certificates that solutions are correct

LANGUAGE OF TUITION

Officially Danish
But Swedish qualifies as Danish for official purposes
I suggest we continue in English...

WHAT YOU NEED TO DO

- Be on top of courseplanning
- Follow lectures (or digest material on your own)
- Read textbooks before and in between lectures!
  (Lectures do NOT cover everything!
- Work on exercises (use TAs at exercise classes)
- Solve and hand in problem sets — REQUIRED FOR EXAM
- Interact with coursemates — help each other

Do yourself a favour: WORK HARD on this course! Will help a lot in later courses!

PROBLEM SETS

- Help you study ~~throughout the course~~ (instead of panicking the week before the exam)
- Problems look like (and are) exam problems — graded in the same way

Rules (check also Absalon):

- Collaborate in groups of 2-3
- But write up everything individually!
- NO COPYING OR SHARING of text, ~~code, formulas~~
  - from each other
  - from the Internet

PLAGIARISM WILL BE REPORTED

- Submit on time on Absalon as PDF file
- Write up in LaTeX (or other math-aware system)
- Graded after one week
- Corrections needed? One week for resubmission

QUESTIONS? Ask (a) now or (b) TAs or (c) on Absalon