0 Administrativa

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Welcome to COMP 526 – Applied Algorithms

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- Module website: www.wild-inter.net/teaching/comp526
  → your first address for any infos on COMP 526

- Piazza: collaborative Q&A (more on this later)
  also used for announcements
  → please register via link on website (https://piazza.com/liv.ac.uk/spring2020/comp526)

- Clickers: student response system for formative feedback
  please bring your smartphone, laptop, etc. to class

- Final marks: 75% final exam + 25% assessments

Overview of the module

Goals:

- build / enhance your toolbox of algorithmic methods and techniques
  - ⇝ focus on practical methods
- enable you to reason about and communicate algorithmic solutions
  - ⇝ level of abstraction, proofs, mathematical analysis
- enable you to apply, combine and extend methods

Units:

0. Administrativa & Proof Techniques
1. Machines & Models
2. Fundamental Data Structures
3. Efficient Sorting
4. String Matching
5. Parallel String Matching
6. Text indexing & Stringology
7. Compression
8. Codes
9. Group Testing & Streaming Algorithms

Components of COMP 526

Clicker questions

immediate feedback
simple questions

Lectures

new material
discussions
big picture

Tutorials

practice problem solving
deep questions, details

Piazza

collaborative Q&A knowledge base

Exam question pool

consolidate knowledge

Programming tasks 1 & 2

find & realize creative solutions

Video presentation

disseminate knowledge

Assessments

$$\text{final grade} = \tfrac{3}{4} \cdot \text{exam grade} + \tfrac{1}{4} \cdot \text{ongoing assessment grade}$$

The ongoing assessments consist of

1. Video presentation
2. Programming task 1 (more on that later in the term)
3. Programming task 2 (more on that later in the term)
4. Participation in clicker questions
5. **Collective bonus points** for online participation
   - good questions and answers on Piazza
   - helpful sample exam questions

What are clickers? Why use it?

- I use “clickers” as short term for any *student response system*
  We will use PINGO, a free web-based system.
- Goal: Collect immediate, formative feedback
  - Stay focused and engaged! (“active learning”)
  - Quick feedback (for you individually) if you are on track.
  - Quick feedback (for me) if (most of) you are on track.

⇝ grade for *participation*, not for correct answers!

Let’s try it!

pingo.upb.de/622222

What is Piazza?

Piazza is a ***collaborative* question & answer platform**

- Ask *public* questions
  - *Why is* $\lg(n^3) = \Theta(\log n)$*?*
  - *Will there be classes during Carneval?*
- ***Answer* your peers' questions!**
  - Know the answer? → put it in!
  - Know a partial answer? → Post it, others can augment it!
  - All answers are *collaborative* efforts (a bit like a Wiki)
- Ask *private* questions
  - if your question might contain "spoilers"
  - if you feel the answer is only relevant for you personally

How to Piazza

- My goals for Piazza:
  1. **be fair** Same answers for everyone
  2. **learning by teaching** YOU will answer most questions!
  3. **be inclusive** posts can be anonymous, take your time

- Therefore, we instructors will
  - redirect you to Piazza for questions,
  - wait before answering, to give other students a chance to answer first,
  - explicitly mark good answers (and questions!) as such

- You will collectively earn **bonus points**:
  - 10 points for each good question
  - 20 points for each good answer
  - 10 extra points for each good answer that did not require clarification from us

Video Presentation

- **Goals:**
  - engage with research literature
  - explore cutting-edge research in one topic
  - try out novel ways of disseminating knowledge

- **Schedule:**
  - **this week**: form teams of 3 – 4 students
  - **next week**: select an article
    - recommendation:

      COMMUNICATIONS OF THE ACM (CACM.ACM.ORG)

      a *contributed article*, *review*, *practice*, or *research highlight* from 2019

      ask me!
    - or: other recent paper in reputable journal/conference with connection to algorithms
  - till **1 March**: present article in video presentation and upload it!

    alternatively, create an interactive website

Pool of Sample Exam Questions

- We jointly collect a **pool of exemplary exam questions**.
- ***You*** *add* ***your*** *questions to it.*
- I will give feedback which questions are realistic.

⇝ great resource for exam preparation

⇝ I will answer selected questions in recap session (last week of reading period)

- Engage in this early (before exam submission deadline!) and pose great questions

  . . . I might be tempted to use your question for the actual exam!

- Start today: `https://www.overleaf.com/6392268671zsrnwsthqynt`

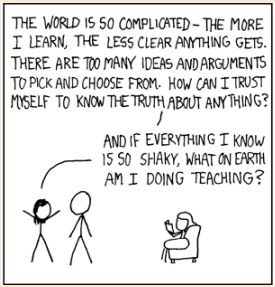
Philosophy of the module

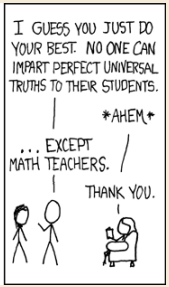
COMP 526 is part of a *scientific* course.

Less . . .

https://imgur.com/gallery/vk118

. . . and more





https://xkcd.com/263/

- ⇝ Focus on *universal truths* of practical algorithms
  - model of reality (machines, programs, data)
  - quantitative predictions
  - validate model in experiments
- ⇝ Need some math techniques.