CS-101 Advanced Information, Computation, Communication I

Karl Aberer

Distributed Information Systems Laboratory

Welcome to

EPFL

Program of today

Hour 1: Everything you need to know about the course
1. Contents of the course (short)
2. Organisation of the course (long)
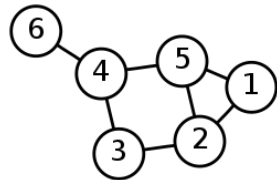
Hour 2: We are starting with **logics**!

1. Subject of the Course

Discrete mathematics: structures of which the number of elements is **finite** or can be **enumerated**

Examples:

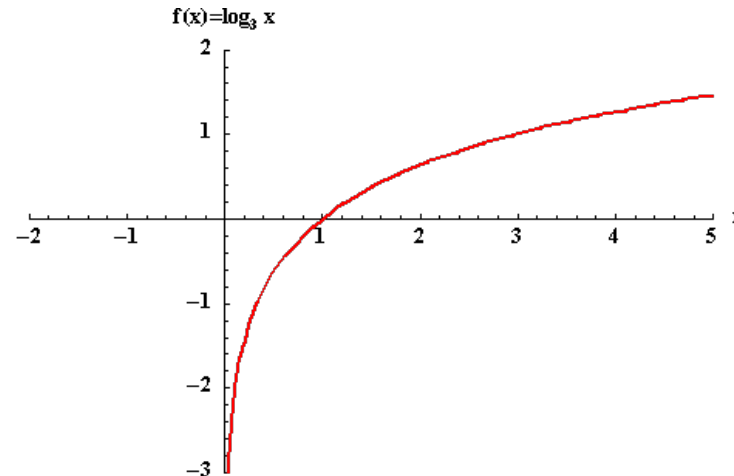Natural numbers: 1,2,3,...

Graphs

Formulas $p \vee q$

Subject of the Course

Discrete mathematics as opposed to structures based on continuous quantities described by **real numbers**

- those are studied in **analysis** and **linear algebra**

Example: a continuous function
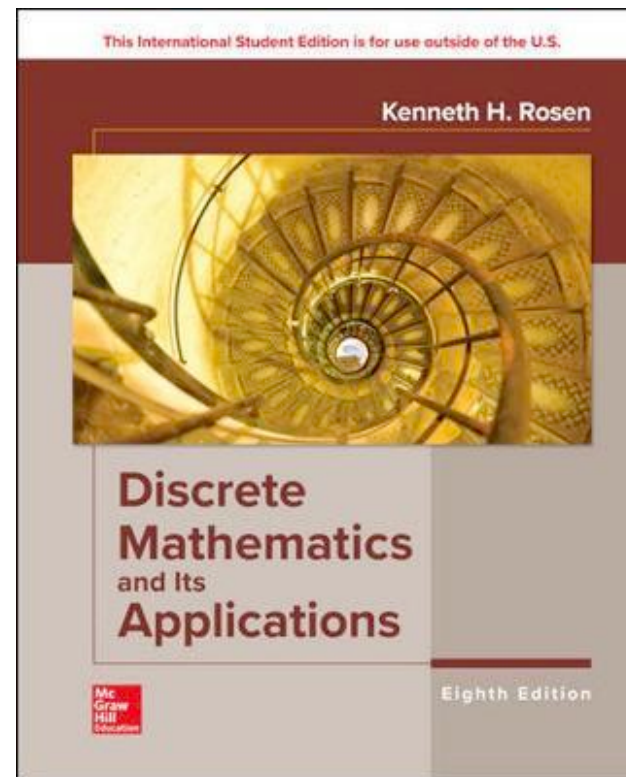
$$f(x) = \log_3 x$$

Why is Discrete Mathematics important for CS?

Discrete mathematics is required to describe how computers work and what computers do, e.g.

- structure of computers is discrete

- data processed by computers is discrete

- structure and logics of programs is discrete

Contents of the Course

This class will be following closely the book "Discrete Mathematics and Its Applications" by Kenneth H. Rosen, published by McGraw-Hill

Schedule of Topics

Week 1	Propositional Logic
Week 2	Predicate Logic
Week 3	Proofs
Week 4	Sets, Functions, Relations
Week 5	Relations, Sequences, Summations
Week 6	Algorithms
Week 7	Complexity of Algorithms
Week 8	Number Theory
Week 9	Induction and Recursion
Week 10	Counting
Week 11	Advanced Counting
Week 12	Probability
Week 13	Advanced Probability
Week 14	Reserve

Relation to other Courses

Core concepts of mathematics, such as *set, function, relation, sequence, summation, induction* will be also covered in other courses, e.g. analysis

Why do we teach them also in AICC?

- We need them to develop discrete mathematics, and the course remains self-contained

- Since they are so fundamental, it does no harm to encounter these concepts in different contexts

- Since this course is given in English, you also learn the English terminology

2. Organisation: COVID

1. We are living in a special time
   - Course will be delivered in **hybrid mode** (physical and online)
   - The situation might evolve and change throughout the semester

2. **Lecture**: life in the Rolex Forum and streamed via Zoom

3. **Exercise**: 7 exercise rooms and online via Discord

4. Access to physical teaching (course and exercise)
   - Requires a valid **COVID certificate**!

Weekly Schedule

1. <u>Tuesday morning</u>, 8:00 – 10:00: **hybrid course in Rolex Forum**
   - **Theory, Examples, Small quizzes, QA**
   - Streamed via Zoom, recording via Switchtube
2. <u>Wednesday afternoon</u>, 15:00 – 17:00: **hybrid course in Rolex Forum**
   - **Theory, Examples, Small quizzes, QA, a weekly quiz**
   - Streamed via Zoom, recording via Switchtube, quiz via Kahoot
3. <u>Friday morning,</u> 10:00 – 12:00: **exercise (7 rooms)**
   - **Exercises, interaction with assistants**
   - Online participation to exercise via Discord
4. <u>Saturday morning,</u> 10:00 – 12:00: **exercise (5 rooms)**
   - **Exercises, interaction with assistants**
   - Online participation to exercise via Discord

Online Platforms

1. Moodle, https://moodle.epfl.ch/course/view.php?id=15272
   - You should be registered and you should have been there
   - Used for official announcements

2. Zoom, https://epfl.zoom.us/j/68585422107
   - Since you are here you know it
   - Used for streaming the lecture, QA, recording, polls

3. Switchtube, https://tube.switch.ch/channels/2q51frV5M8
   - For registered lecture and pre-registered course content

4. Discord, https://discord.com/
   - For exercises and interacting with your assistant

5. Piazza, https://piazza.com/epfl.ch/fall2021/cs101/home
   - For discussing and resolving questions, among students and with assistants

6. Kahoot, https://kahoot.it/
   - For the weekly quizzes

Piazza

Questions

Moodle

1. I have been visiting Moodle: yes/no

2. I found the information sheet for the course: yes/no

Participation

1. I plan to participate to the lecture physically/online

2. I plan to participate to the exercises physically/online

3. I am interested in participating to the Saturday exercises yes/no

Exercises

- Exercises will be distributed at the beginning of the week

- Exercises contain 2 parts

  1. Open questions: they help to deepen the understanding of the subject

  2. Exam questions: they are examples of exam questions from earlier years

- We will mark the degree of difficulty of the questions

- If you do not manage to solve a problem on your own, don't panic. Some questions are hard, but help to improve understanding of the subject.

Exercises

Every student will be assigned an **exercise group with an assigned room**

Students that wish to participate **online** can do so via **Discord**

Detailed schedule will be communicated on Moodle when we have student data and now about physical vs. online participation!

Assistant Team

7 Head assistants (EPFL PhD students)

- Banaei Mohammadreza, Negar Foroutan, Dou Guohao, Pradeep Aditya, Kaluderovic Novak, Behjati Melika, Kivva Yaroslav

- Preparing and supervising exercises, supporting life lecture, answering questions, helping in organisation

24 Student assistants (EPFL bachelor and master students)

- Available during the exercise sessions, accessible via Discord, answering questions on Piazza

Student Assistants

Benefit from their support!

- They are here to support you
- They know the material
- They liked the course
- They did the exam (very successfully)

Attendance

1. Attending the lectures or participating in the exercise sessions is not mandatory, but strongly recommended.

2. It is also recommended to actively participate through questions!

Asking Questions

You have 5 channels to ask questions

Platform	modality	when	what	answered	visibility
Moodle	offline	Anytime	Organisational	Online	public
Zoom QA	online	During lecture	Course content	During or after lecture	public
Discord	offline	During the week	Exercises and course content	Online or Friday exercise	Public or private
Discord	online	During Friday exercise	Exercises and course content	Friday exercise	Public or private
Piazza	Offline	Anytime	Exercises and course content	Online	Public

Some Recommendations

1. Follow the schedule
   - Do not procrastinate, do not pile up
2. Ask questions
   - Important for you to remove any doubts
   - Important for us to monitor your progress
3. Do (or try) the exercises yourself
   - Best preparation for exam
4. Do it your way
   - If you prefer live interaction, come on campus
   - If you prefer to read, read
   - If you prefer videos, watch videos

Exam

1. There will be one exam (the final exam)

2. There will be a midterm exam (whether graded not yet clear)

3. The final exam will be in both French and English.

4. It will consist of multiple choice questions on subjects treated during the semester.

5. There is only one correct answer.

6. Multiple answers can be given. If the correct answer is contained, points are received. If not, points are lost. Details will be communicated later.

7. Example questions from earlier years will be made available.

Conditions

Absence

- You have to submit a doctor's attest if you miss the final exam due to sickness.
- No other reasons for not taking the final exam will be accepted.

Irregular behaviour

- In case of irregular behaviour during the final exam EPFL's standard policies apply.

Contacts

Lecturer: Karl Aberer, karl.aberer@epfl.ch

- You can contact me anytime by email.
- If necessary, I will schedule a Zoom meeting to clarify critical questions.

Teaching assistants

- Please contact them for any organisational questions or questions related to the course content that you cannot resolve with your teaching assistant.
- Their coordinates are found on Moodle

Stay tuned!

We might to adapt our organization to the circumstances, experiences and feedbacks received