Course Introduction

Daniel Kocher

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Department of Computer Science
University of Salzburg

database
research group

PARIS
LODRON
UNIVERSITY
SALZBURG

Agenda

Today's Agenda

1. Introduction
2. Organizational Matters
3. Outlook
4. Discussion

Who Am I? Who Are We?

Who am I? Daniel Kocher, Research Assistant, Computational Systems Group

Database Research Group (summer 2019).

Contact & Lecture Policies

Contact (in this order):

1. **Lectures:**
   - Group 1: On Wednesdays, 12:00 - 02:00 pm CET.
   - Group 2: On Mondays, 10:15 - 12:00 pm CET.
2. **Slack:** `https://dbteaching.slack.com/` (**create** an account with the stud email).
3. **Email:** dkocher@cs.sbg.ac.at (as a last resort).

Please **interrupt me** immediately if

- you have **troubles understanding** what I am talking about,
- you have a **question** related to the current topic, or
- there is an **error on my slides**[1] (1 bonus point/error; max. 5 bonus points/student).

[1] No punishment if it is not an error. Typos do not count (unless relevant), but please notify me anyways.

Why You Should Take This Course

The amount of **information** is growing rapidly and **needs to be managed**.

Many systems for different scenarios have been developed.

You must be able to **choose the proper system** for your use case.

Course Objectives

- **Overview** on the landscape of **database management** and **processing systems.**
- Learn about the **challenges** these systems have to deal with.
- Learn to **choose a system** for a given problem.
- **Hands-on experience** with selected systems.
- Be aware of **emerging trends** in database management systems.

Topics

Data Management:

- Declarative query processing.
- General-purpose and specialized database management systems.
- Relational and non-relational logical models.
- Workloads and challenges.
- Transaction models (ACID vs. BASE).
- CAP Theorem.
- SQL, NoSQL, and NewSQL systems.
- Database as a service (DaaS).

Topics

Data Processing:[2]

- Batch processing (e.g., Apache Spark).
- Stream processing (e.g., Apache Flink).
- Industrial-scale machine learning (e.g., Apache SystemDS).

Emerging Trends:[2]

- Self-designed and learned data intensive systems.
- Blockchains and database management systems.
- Data management on modern hardware.

[2] Topics not fixed yet.

Topics

We will cover some basics of database management systems, but **not the internals in detail.** For internals, we refer to other courses at the Department of Computer Sciences.

Undergraduate Courses:

- Databases 1 (VO+PS; summer term)
- Databases 2 (VO+PS; winter term)
- Database Tuning (VO+PS; summer term)

Graduate Courses:

- Advanced Databases (VO+PS; winter term)
- Non-Standard Database Systems (VO+PS; summer term)
- Similarity Search in Large Databases (VO+PS; winter term)

Requirements

VU Grundlagen Informatik und Systeme (512.023)

⇒ **Basic principles** of computer science and systems.

UE Einführung in Programmieren mit Python (512.024)

⇒ **Basic programming skills** (e.g., in Python3).

Organizational Matters

Where to Find Information

Website: `https://dbresearch.uni-salzburg.at/teaching/2022ss/dim/`

- Announcements (important announcements also via email).
- Detailed grading scheme.
- Schedule + slides.
- Assignments (incl. late submission policy).
- Midterms (incl. topics).

Where to Get Help

Slack:

1. **Create an account**[3] for our DBTeaching workspace (using your stud email).
2. **Log in**to the workspace.
3. Browse the channels and **search** for **channel** "`dim-uv-2022ss`".
4. **Join channel** "`dim-uv-2022ss`".
5. **Say "Hi"** to the others in the channel :)

[3] Top right corner in most browsers.

Lecture

General Information:

- There are **two groups:**
  - Group 1: On **Wednesdays, 12:00 - 02:00 pm CET.**
  - Group 2: On **Mondays, 10:15 - 12:00 pm CET.**
- Lecture will be in **hybrid mode**, i.e., **in person** but **streamed online.**
- **Theoretical background** for the **assignments.**
- Covers all **relevant topics** for the **exams.**
- **Attending** the lecture is **mandatory** – *"prüfungsimmanent"*.

Grading Scheme

Assignments		Exams		Total
Assignment 1	18%			
Assignment 2	18%	Midterm exam	23%	
Assignment 3	18%	Final exam	23%	
	54%		**46%**	**100%**

Grading Scheme

Overall Points	Grade
$\geq 88.75\%$	1
$[77.5\%, 88.75\%)$	2
$[66.25\%, 77.5\%)$	3
$[55\%, 66.25\%)$	4
$<55\%$	5

Assignments

General Information:

- **Groups of three** students (enrollment via Blackboard[4]).
- **Practical assignments** related to the topics covered in the lecture.
- Submission via **Blackboard** (4 weeks per assignment; max. 5 weeks).
- **3 assignments**, **each of which contributes 18%** to your grade.
- Assignments are **graded per group.**
- Please notify me if a student does not contribute to the assignments.

[4] If there is any problem in the Blackboard course, please notify me as soon as possible.

Assignments

Late Submission Policy: You can submit late (up to one week) but **you will lose 5%** of the assignment's total points for **every 24h delay**. Delay is computed with respect to the initial deadline and is **rounded up** to the next multiple of 24.

Example: You submit 25h late. Then, it is counted as 48h and results in -10%.

After-Assignment Meetings: Short meetings to **discuss your submission** and the **grading**. **One meeting per assignment and group** (about 12min.; max. 15min.). Students will need to **answer questions** directly related to the assignment. This may also affect the final grading (positively or negatively).

Assignment 0

Task:

1. Find yourself a team of three students.
2. Enroll your team in the Blackboard course.

Deadline: March 16, 2022, 11:55 pm (aka 23:55) CET

Students without a team are randomly assigned to groups by the instructor.

Exams

General Information:

- Exams will be held via **Blackboard**.
- **2 exams** (midterm and final), **each of which** contributes **23%** to your grade.
- An exam will last **at most 1.5h.**

The **exam date** and **time** is the **same for all students** (disregarding PlusOnline groups).

Schedule – Assignments

Assignment 1 **Timeframe:** March 23, 2022 – April 20, 2022 (late: April 27, 2022)
Deadline: 11:55 pm (aka 23:55) CET
Meeting: Week of April 27, 2022

Assignment 2 **Timeframe:** April 20, 2022 – May 18, 2022 (late: May 25, 2022)
Deadline: 11:55 pm (aka 23:55) CET
Meeting: Week of May 25, 2022

Assignment 3 **Timeframe:** May 18, 2022 – June 15, 2022 (late: June 22, 2022)
Deadline: 11:55 pm (aka 23:55) CET
Meeting: Week of June 22, 2022

Schedule – Exams

Important: Dates that are **identical for all students** – on two Wednesdays.

Midterm Exam **Date/Time:** May 11, 2022, 12:00 pm.
Topics: Everything until May 2 and 4, 2022 (excl.), respectively.
Q&A Session: May 2 and 4, 2022, respectively.

Final Exam **Date/Time:** June 29, 2022, 12:00 pm.
Topics: Everything until June 20 and 22, 2022 (excl.), respectively.
Q&A Session: June 20 and 22, 2022, respectively.

Q&A