Organization

Course Goals

Methods:

- Practice to read scientific papers
- Learn how to write a scientific paper
- Learn how to give a scientific talk
- Learn how to discuss scientific literature and give feedback

Content:

1. Fundamental approaches to query execution
2. Efficient execution of queries and operators
3. Selected modern query engines

Expected Work

During the course each of you will create:

- A research report **draft** (5-8 pages + references):
  - summarizing the assigned topic and discussing it
  - also in context of other papers discussed in the seminar
- A presentation (13-15 minutes)
- 2 peer reviews for your fellow students (<1 page each)
- A **final** research report (5-8 pages + references):
- Meaningful contribution to the discussions

During the course each of you will read 8-10 papers:

- your assigned paper
- the paper also presented in your slot (to spark the discussion)
- 2-3 fundamental papers for each of the three topic blocks

Grading

Rough estimate of grading contributions:

- $\approx 45\%$ Report
- $\approx 25\%$ Presentation
- $\approx 10\%$ Peer reviews
- $\approx 20\%$ Active discussion

This is subject to change!

Timeline

Preliminary timeline:

- Thu 24.04.2025 introduction lecture 01 | **submit** topic preferences
- ~~Thu 01.05.2025~~ Holiday
- Thu 08.05.2025 introduction lecture 02
- Thu 15.05.2025 introduction lecture 03
- Thu 22.05.2025 presentation session 01
- ~~Thu 29.05.2025~~ Holiday
- Thu 05.06.2025 presentation session 02
- Thu 12.06.2025 presentation session 03 **submit** report draft
- ~~Thu 19.06.2025~~ Holiday
- Thu 26.06.2025 $\emptyset$
- Thu 03.07.2025 presentation session 04 | **submit** peer reviews
- Thu 10.07.2025 presentation session 05
- Thu 17.07.2025 presentation session 06
- Thu 24.07.2025 presentation session 07 | **submit** final report
- **Attendance to all sessions in presence is mandatory**

Contact

- Website: https://db.in.tum.de/teaching/ss25/seminarModernQueryEngines
- i3mqe@db.cit.tum.de

Report Requirements (1) Structure

You will get a session topic and a focus topic assigned. We expect you to follow this structure:

- **Abstract**: Summarize all contents and results of your report.
- **Introduction**: Show the relevance of the problem and where it occurs. List what your report addresses.
- **Background**: Explain required previous knowledge. (optional)
- **Main Part**: Describe core ideas, methods, and solutions of your topic. This might include more than one section.
- **Related Work & Discussion**: Discuss the assigned topic in the context of related work and other topics of this seminar.
- **Conclusion**: Briefly recap the contents and value of your report. Show the impact of your presented method.

Try to add value to your work. There should be a reason to read your report instead of the original papers.

Report Requirements (2) Further Points

Furthermore, the following points are important for your report:

- **Content**: Try to create additional value in addition to the existing paper!
- **Language**: Use good scientific writing style. Write precise, concise, clear, and uncomplicated. *Use your favorite LLM for speilling/grammar checking!*
- **Use your own words**
    - Write the report on your own, don't generate your text!
    - We will notice (also in the discussions) if you have understood the text you wrote!
    - Not your own words, you don't pass the course!

Report Requirements (3) Further Points

Furthermore, the following points are important for your report:

- **References**: Show your work on literature review by citing relevant sources. Adhere to citation guidelines.
- **Figures**: Your report needs to include at least one figure that actually enriches the report. Good are visualizations explaining algorithms, examples, architecture overviews. In many cases, it will be beneficial to create customized figures tailored to your report. Caption text of all figures has to be your own.
- **Length**: Stay within a page count of 5-8 pages. References do not count.
- **Format**: Your report needs to be in the VLDB format. If there is *any* visual difference to this template, we will deduct points. You have to submit as PDF.

Report Draft Requirements

Submit an earlier version of your final report for the peer review process.

- **Content**: This should be as close to your final submission as possible. It should be possible for your peers to give you meaningful feedback in their reviews.
- **Length**: The same as the final report.
- **Format**: The same as the final report.

Peer Review Requirements

You will read two of your peers reports and write reviews for them. We will follow a single-blind review process: Reviewers stay anonymous.

- **Content**: Pay attention to the following points:
    - **Sections**: Does every section serve its purpose?
    - **Structure**: Is there a coherent narrative?
    - **Argumentation**: Can you follow the points of the report?
    - **Language**: How can the writing quality be improved?
    - **Simple Mistakes**: Point out simple improvements such as typos.
    - **Strong Points**: Name at least two good things about the report.
- **Tone**: Be constructive and friendly. Your job is to help your peer to improve their report.
- **Length**: Stay within 150-300 words. Be concise!
- **Format**: Submit as PDF.
- **Effort**: Should take you no longer than two hours.

Presentation Requirements

You should present key points of your topic:

- **Content**: Key points of your focus topic papers. Teach us what we can learn from this paper. You may limit the presentation scope to your focus topic.
- **Audience**: Optimize your presentation for your peers.
- **Scope**: It might be necessary to limit the content of your presentation. Make sure the audience can learn something new. It is not necessary to include everything.
- **Format**: Submit as PDF. You will present using our laptop.
- **Time**: Stay within 13-15 minutes. We will cut you off after 16 min!

Deadlines

Deadlines for everyone:

- Topic Preferences: 29.04.2025
- Report Draft: 12.06.2025
- Peer Reviews: 03.07.2025
- Final Report: 24.07.2025
- Presentation Slides: 1 day before your presentation.

All deadlines are at 23:59.

Feedback Slots

- We offer feedback slots:
    - one 20 minute slots before the draft submission deadline (on two days $\approx$ in the beginning of June)
    - on-demand: feedback to your presentation
- Usually personal meetings will improve your final grade

Session Schedule

The structure of a presentation session: 2 Presentations per session

- Present for 13-15 min. (I will stand up after 15, cut you off after 16 min)
- Questions & Discussion
  - Everyone is supposed to actively participate in the dicussion.
  - Higher expectations for the two presenters.

Short break for 5 min between the presentations

Questions & Discussions

- Ask clarifying questions
- How does the topic relate to other papers, especially to fundamental papers.
- What are the advantages, limitations, and tradeoffs?
- Could (some aspect of) this be also applied for X?
- Could one further improve some aspects?
- The presenters are responsible for the moderation
- Discuss as natural as possible. Do not read prepared text. Interact.
- About 20-25 minutes in total

Next Steps

- Find your preferred session topics on the seminar website (or propose your own):
- Rank your top three favorite session topics and focus topics and send them to to the seminar email. Your message should look like this:

```
My topic preferences:
(optional:) 0: My own topic proposal
1: Fundamentals of Query Execution: Relaxed Operator Fusion
2: Implementing Operators: Efficient processing of window functions
3: Implementing Operators: The complete story of joins
```

- Spend enough time to find a topic you really want to work on!
- Deadline is 29.04.2025