(Note fra luca – teams versionen kan ændres tjek en ekstra gang)

Exam project

2025_2_databases

Write a report showing your reflections and considerations with regards to the topic and the project

1 student - min. 10 - max. 15 pages
2 students - min. 15 - max. 20 pages
3 students - min. 20 - max. 25 pages
4 students - min. 20 - max. 30 pages

The exam is still individual.

Questions only in the public channel for this course

Hand-in

On Wiseflow as PDF. You will get an email from the administration.

The hand in is individual and cannot be a copy of other reports.

All the points below are mandatory and must be part of your report. Failure to deliver it will not allow you to attend the exam and therefore get a 00.

The censor and the teacher already know the theory; we need to know how you use it in your system.

The report

In the mandatories you had to model a relational database. You can use the same idea as the basics, or model a whole new system.

The same relational database system from the Mandatories must be applied to a document database. This means that you are going to write about document

databases, collections, documents, embedding, and/or referencing and you will also demonstrate how to model the system using a document database.

Extend/Convert the relational database into a graph database. This means that you will have nodes/vertexes and edges.

At the exam you will be asked to show the document and graph databases. For this course we used ArangoDB. If you prefer to use another database, it is also fine.

Reflect upon the use of "primary keys" and "foreign keys" in a document database. How do documents connect? What options are there? Is it better to reference and/or embed or better use a Graph Database structure?

Write about how you will solve a situation in which a document contains too much data. How will you store the "connections" to other documents?

What is an "in-memory" database? What parts of your system could be used in these types of databases? Use Redis as an example.

What is a Graph database? What is an "edge", "vertex/node", "path", and "attributes". What parts of your system could be used in these types of databases? What is inboud, outbound, any

Prepare CRUD queries and make sure they run in a document database of your choice. You can have those queries ready, and you will be asked to run them at the exam. In the written part, simply explain what those commands are supposed to do.

Write and prepare at least 2 graph database commands and make sure they run in a graph database of your choice. You can have those queries ready, and you will be asked to run them at the exam. In the written part, simply explain what those commands are supposed to do.

In a relational/document database what is Full Text Search? Make sure you apply this concept to your own database. You will be asked to give a practical example of it.

What other types of JOIN do you know? Write and have practical examples where you demonstrate the other types of JOIN you have discovered. For example: left join, right join, and so on.

Write about triggers and make sure you have at least 2 triggers created in a relational or document database.

Write about stored procedures/functions/routines and make sure you have at least 2 stored procedures created in a relational or document database.

Write about “views” and make sure you have at least 2 views created in a relational or document database.

Prepare and explain when you could use SQL queries as "UNION", "HAVING", "GROUP BY".

Add any topic that you find relevant to the report. This can be applied to any type of database.

Write about constraints. For example, "on delete cascade". Why is it useful, where do you think it can be applied?

Write about indexes, where they should be applied and why

Reflect upon vertical vs horizontal scaling. Which type of database is better in which situation?

Write about a situation or situations in which you consider that denormalizing will be beneficial for your relational database or could make the system easier to maintain.

During the exam you will be asked to open PhpMyAdmin and demonstrate how to run any command, create constraints, import, export or any topics we have covered during the class. Since our "in-memory/document/graph" database is ArangoDB, you will be asked to run some commands using it. If you decide to use a different database, then you will be asked to run commands on that database.

You can watch this video

https://youtu.be/HljkIQxq3x8

This link contains sub-links. Every sub link is part of the exam. For example: Aggregate Functions , SUM, AVG, BETWEEN, AND, OR, etc...

https://www.w3schools.com/sql/default.asp

Hand-in - The report on Wiseflow following the instruction given in an email you will receive from administration. You do not need to hand in any code (no python, no js, no css, no html), only the report.

At the exam you can prepare anything you want for 5 to 7 minutes. Then you will get live code questions and theoretical questions as well.

Every topic discussed during the class in theory or practice is part of the exam. Every link, video, post on Teams, Github repos, and in general everything we have done in the class is part of the exam.