COMP9311: Database Systems

Term 3 2021

Week 10 – Closing

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Disclaimer: the course materials are sourced from previous offerings of COMP9311 and COMP3311

What is “Database”?

Database

- ... a collection of **related** data ...
- Data items alone are relatively useless … We need the data to have some structure

Example:

- a student records database
  - Contains information identifying students, courses they are enrolled in, results from past courses, ...
- IMDb movie database
  - Contains information about the movies, actors, theatres showing the movies, other movies the director also directed in, …

Databases cover a range of topics …

The field of *databases* deals with:

- ***data*** ... representing application scenarios
- ***relationships*** ... amongst data items
- ***constraints*** ... on data and relationships
- *redundancy* ... one source for each data item
- ***data manipulation*** ... declarative, procedural
- effective storage and retrieval of data … indexing, query processing
- *transactions* ... multiple actions, atomic effect
- *concurrency* ... multiple users sharing data
- *scale* ... massive amounts of data

Overview: Database Systems

- Data models:
  - ER
  - Relational Data Model and their mapping
- Relational Algebra
- Database Programming Languages: SQL, PLpgSQL
- Relational Database Design: Functional Dependency, Normal Forms, Design Algorithms for 3rd normal form and BC normal form
- Database Systems:
  - Storage/Index (an overview)
  - Query Evaluation (an overview)
  - Transaction Management
- NoSQL databases

Final Exam

Online exam. 26th November Friday 2pm – 5pm

This Friday (19th) from 1pm onwards, there will be a mockup exam session, simulating the exact exam environment. You are encouraged to attend …. It is the last opportunity to get your computing environment sorted for carrying out the exam.

- The link to the exam will be valid until the exam day.

The exam paper will be released through WebCMS3, you will submit your answers through WebCMS3, similar to how you submitted your assignments.

Exam in Two Parts (out of 100) – total 3 hour exams

- (~30%) SQL and PLpgSQL programming 4-5 questions (allocate Max 1 hour)
- (~70%) Short and Long Answers (allocate 2 hours)
    - Covers all topics except SQL and PLpgSQL

Review your exercises before the exam

Do Lab exercises

Do exercises from the lectures

The Practical Part of the Exam:

Week 4 and Week 5 (SQL and PLpgSQL) – roughly split: 80% on SQL, 20% on PLpgSQL

The Theory Part of the Exam: - roughly split: 70% on Week 1,2,3&7, 30% on Week 8,9&10

Week 1 Data modelling

Week 2 Relational Model and ER to Relation Mapping

Week 3 Relational Algebra

Week 7 Relational Design Theory

Week 8 Storage, Index and Query Processing

Week 9 Transaction Management and Concurrency Control

Week 10 Other Database Systems