Lecture and Exercise (M.Sc. in Information Systems)

Business Intelligence and Data Management
Winter Term 2021/22

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Information for Students & Syllabus

1. Content

This course presents theoretical and practical approaches for the development of information systems for management that support reporting, decision-making, and analytics. The starting point is data warehousing and the conceptual specification of information systems for management as an information warehouse aimed at reporting. Concepts such as Data Warehouse (schema design) and Online Analytical Processing (with and without SQL) will be covered during the course. A methodical framework for the design and development of information systems for management based on these concepts and technologies will be presented. Subsequently, advanced concepts for big data analytics and distributed data management will be discussed (e.g., data lakes, NoSQL databases such as key value stores, MapReduce algorithm). Finally, exemplary techniques for data analytics in the context of data warehouses and data lakes is presented and discussed.

Chapter 1   Introduction
Chapter 2   Data Warehouse Fundamentals
Chapter 3   Multidimensional Data Modelling
Chapter 4   NoSQL Databases
Chapter 5   Big Data Systems
Chapter 6   Fundamentals of Data Analytics

Basic knowledge of (1) relational databases and (2) SQL should already have been acquired in the course of studies and is assumed.

2. Materials

The basic information about the course and all materials (slides, exercises, ...) will be provided in time for the course by using ILIAS (https://www.ilias.uni-koeln.de). Communication outside the lecture hall is mainly done via the forum integrated in ILIAS. All organizational information about the event will be provided via ILIAS.

3. Literature

A number of textbooks cover parts of the course content:

- Efraim Turban et al., Decision Support and Business Intelligence Systems (9th edition, 2011).
- Han, J. et al., Data Mining: Concepts and Techniques (2nd edition, 2006 and 3rd edition, 2011).
- Lemahieu, W. et al., Principles of Database Management (1st edition, 2018).
- Silberschatz, A. et al., Database System Concepts (7th edition, 2018).
- Sherman, R., Business Intelligence Guidenook (1st edition, 2014)

4. Attendance in Lectures and Exercises

Attendance in lectures and exercises is a necessary (but certainly not sufficient) condition for successful participation in the final exam. In addition, it is advisable to actively prepare the exercises and spend time preparing the content before each lecture in order to familiarize oneself with the basics of the respective topic (technical terms, basic ideas, ...). In this way, the lecture can become a real learning experience.

5. Exercises

There will be multiple subject areas which will be discussed in the respective exercises. The idea of the exercise is that the tasks are worked on together and interactively, so that questions can be asked during the event and attendants can be guided through the solution.

Prior to class, the exercise sheets are made available as downloads exclusively in ILIAS on the corresponding course sections (i.e., not on the websites of the chair).

6. Grading

The grading of the event is determined by the grade of the 60-minute final exam.