Engineering studies in IT - umiędzynarodowiony program studiów
prowadzonych przez Wydział Matematyki i Informatyki UAM w Poznaniu
Nr projektu POWR.03.03.00-IP.08-00-MPK/16

DATABASES
Learning module description

GENERAL INFORMATION

1. Module title: Databases
2. Module code: DBAD LI0-E
3. Term: summer
4. Duration: 30h lectures + 30h laboratories
5. ECTS: 6
6. Module lecturer: Marek Wisła
7. E-mail: mwisla@amu.edu.pl
8. Language: English

DETAILED INFORMATION

1. Module aim is to present basic notions and concepts of database systems, both from theoretical and practical point of view. Students will get acquainted with the principles of database modelling, relational database model, schema normalization and SQL query language. Moreover we discuss the concept of a transaction and ACID properties, basic data structures, indexes and optimization process, security. The laboratories include theoretical exercises and practical tasks and projects.

2. Pre-requisites in terms of knowledge, skills and social competences (where relevant):

SYLLABUS:

Week 1: Basic concepts of relational data model; integrity constraints - types and importance.
Week 2: Database modelling using entity-relationship diagrams (ERD); transformation to relational model.
Week 3: Functional dependencies and normalization of database schema.
Week 4: Functional dependencies and normalization of database schema (cont.)
Week 5: Basics aspects of SQL.
Week 6: Advanced aspects of SQL.
Week 7: Methods of SQL queries optimization; physical database layer
Week 8: Indexes in relational database; B+ -tree structure as the main structure implementing the indexes in the database.
Week 9: The concept of transaction; ACID properties of a transaction; isolation levels and related anomalies.
Week 10: The concept of transaction; ACID properties of a transaction; isolation levels and related Anomalies.
Week 11: Concurrency control; serializability; 2PL algorithm.
Week 12: Non-relational databases: key-value stores, document databases, graph databases.
Week 13: Database security and privileges types.
Week 14: Database recovery; UNDO/REDO algorithm.
Week 15: Database applications: types of architecture, data access methods.

ENGINEERING STUDIES in IT

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