Tecnologie e Sistemi per la Gestione di Basi di Dati e Big Data

Proff. Marco Patella, Paolo Ciaccia
Course objectives

- Knowledge of realization principles of DataBase Management Systems
- DB physical design
- Basically two points of view:
  - Data storage and indexing (M. Patella)
  - Query processing (P. Ciaccia)
Course program

- Architecture of a DBMS
- Physical structure of a DBMS
- Indexing
- Transaction management
- Query processing
- Physical design
- Multi-dimensional data
- Top-k and Skyline queries
- Big data and NoSQL systems
Class schedule

- Monday      12-14      room 4.1
- Wednesday   15:30-18:30 room 5.4
Prerequisites

- For students coming from Comp.Eng. (BO):
  - Sistemi Informativi T
  - (Tecnologie Web T)
- For other students:
  - Any course on DBs (relational model/SQL)
Basic concepts

- What is a DBMS?
- What is a relational DBMS?
- How can I access a relational DBMS?
- What are the issues when accessing a relational DBMS?
- (How do I design a relational DB?)
The “Information Systems” path

- Is there something outside “traditional” information systems?
- Is there something outside relational DBMS?
- The answer is “YES!”:
  - Data Mining M
    - Other data types
    - Data analytics
  - Multimedia Data Management M
    - Other data types
    - Other query types
“Data” management

- The common thread that links courses is the efficient management of large amounts of data.
- Unfortunately (?), not all problems are solvable using a relational DB.
Example 1: recommendations

- Recommending new products

- DB of products and clients
- How do I integrate them?
- New queries...
Example 2: search engines

- How do they work?
  - New data types and queries
Example 3: advanced search engines

- How do they work?
  - New data types and queries
Example 4: social networks

- Sharing personal data among users
Assessment Methods

- Oral exam
  - Both “POVs” are investigated
  - Score obtained as the average on the two exams
- No specific (pre-determined) exam sessions
  - The exam date is agreed with the teachers
  - Possibly, students will be grouped into sessions
Teaching materials

- All slides are available on the course page
  
  http://www-db.disi.unibo.it/courses/TBD/

- Other available resources:
  - Communications
  - Warnings...
Other suggested textbooks

- A. Albano: Costruire Sistemi per Basi di Dati, Addison-Wesley, 2001
- P. Lewis, A. Bernstein, M. Kifer: Databases and Transaction Processing, Addison-Wesley, 2002
- D.E. Shasha, P. Bonnet: Database Tuning, Morgan Kaufmann, 2003
Contacts

- **Teacher:** Marco Patella
- **Office hours:**
  - Thursday, 15-17
    c/o DISI building
- **Address:**
  - Tel.: 051 – 2093800
  - e-mail: marco.patella@unibo.it
  - Internet: http://www-db.disi.unibo.it/~mpatella
Contacts

- Teacher: Paolo Ciaccia
- Office hours:
  - Thursday, 14:30-16
  - c/o DISI building
- Address:
  - Tel.: 051 – 2093070
  - e-mail: paolo.ciaccia@unibo.it
  - Internet: http://www-db.disi.unibo.it/~pciaccia