

# DataBase

# DataBase people

- Me - Calin CENAN
- You

# DataBase site

- <http://users.utcluj.ro/~calin/DataBase/>

# Test

- Why study databases ... ?
- myths ...
- What are ***you*** want to learn during course and laboratory work on database topic

# DataBase

- database technology still plays key role in information management
- database theory and technology are important components in center of information systems

- meet curriculum requirements
- help students developing database systems
- Database, design database, design database system (database system - integrated project that consists of various technologies)
- how database can be used to process information

- **autovit.ro** last transaction (Naspers) value **4.7 mil. Euro**
- Site revenue > 630.000 euro / year
- maintenance < 100.000 euro
- DataBase = value = \$ (a lot of \$)

- Goal
- TextBooks
- Definition
  - Data Model - Relational
- Importance
- Relation theory



# DataBase Course's GOAL

- to present introduction to database and database management systems
  - organize information in DBMS
  - retrieve it efficiently
- concentrates on ***relational*** systems, which are by far the dominant type of DBMS today

# DataBase Course Schedule

- Monday 16 – 18 room P03

# DataBase Practice GOAL

- use DataBase Management System
- implement databases
  - MS Access
  - SQL Server
  - MySQL
- ***Structured Query Language SQL***
- implement databases applications

# DataBase Laboratory Work Schedule

- Tuesday 8 – 20 room 214 Observator group 1, 4, 3
- Thursday 10 – 14 room 214 Observator group 2

# Course Textbooks

- **R. Ramakrishnan, J. Gerhrke, Database Management Systems, McGraw Hill, 2002**
- J. Ullman, H.G. Molina, J. Widom, Database Systems, Prentice Hall, 2001

# Course Textbooks

- R. Dollinger, Ed. Albastra 2001
- Baze de date
- Baze de date și gestiunea tranzacțiilor
- Utilizarea sistemului SQL Server (SQL 7.0, SQL 2000)

# Course Textbooks

- Sams Teach Yourself SQL in 10 Minutes
- SQL For Dummies
- Lynn Beighley, Head First SQL - Your Brain on SQL, O'Reilly, 2009
- <https://www.w3schools.com/sql/>
- ***<https://sqlzoo.net/>***

# Course Textbooks

- %SQL Server%
- %MySQL%
- %Access%



# Course

# PART I: DATABASE CONCEPTS

- Introduction to Database Systems
  - Basic Concepts and Definitions
  - Data Versus Information
  - Database, DataBase Management System
- Database System Architecture
  - Schemas
  - ANSI-SPARC Database Architecture: Internal, Conceptual, External
  - **Data Independence**
  - Data Models
  - Entity-Relationship (E-R) Data Model

# PART II: RELATIONAL MODEL

- Relational Algebra and Calculus
- Relational Query Languages
  - Codd's Rules
  - **Structured Query Language (SQL)**
- Entity-Relationship (ER) Model

# PART III: DATABASE DESIGN

- Functional Dependency, Decomposition
- Normalization

# PART IV: PHYSICAL, COMMERCIAL DATABASES

- Physical Data Organization
  - Indexing
- COMMERCIAL DATABASES
  - Microsoft SQL Server
  - MySQL
    - php, web database applications
  - Microsoft Access

# PART V

- Query Processing and Optimization
- Transaction Processing and Concurrency Control
- Database Recovery System
  - Backup & Restore
- Database Security

# PARTS for Advanced Hardcore DataBase Design 4<sup>th</sup> year

- Object-Oriented Databases
- Object-Relational Database
- Parallel Database Systems
- Distribution Database Systems
- Decision Support Systems (DSS)
- Data Warehousing and Data Mining
- Emerging Database Technologies (NoSQL)

# Laboratory



- 1 week Access
- 2-3 weeks Access Query, SQL, SQLzoo
- 1-2 weeks Access forms, reports, ...
- 2 weeks SQL Server
- 2 weeks MySQL
- 2 weeks DataBase design
- 2 weeks DataBase Applications

# Curricula Syllabus

- [http://cs.utcluj.ro/csd/pics/plan\\_invatamant/Fise\\_an2\\_3\\_cs\\_18-19.pdf](http://cs.utcluj.ro/csd/pics/plan_invatamant/Fise_an2_3_cs_18-19.pdf)

- as always it is not possible to close whiteout **thank you for your kindly attention!**
- *If you get half as much pleasure - the guilty variety, to be sure - from reading this slides as I get from writing it, we're all doing pretty well.*

You can safely skip the rest of the slides about

**DATABASE = ROMANTIC**

# DataBase course

- Romantic hero
- Barbarian
- Civilization
- Lost cause

# The Charge of the Light Brigade

- Half a league, half a league,
- Half a league onward,
- All in the valley of Death
- Rode the six hundred.
- "Forward the Light Brigade!
- Charge for the guns!" he said.
- Into the valley of Death
- Rode the six hundred.

# The Charge of the Light Brigade

- Forward, the Light Brigade!"
- Was there a man dismay'd?
- Not tho' the soldier knew
- Some one had blunder'd.
- Theirs not to make reply,
- Theirs not to reason why,
- Theirs but to do and die.
- Into the valley of Death
- Rode the six hundred.

# The Charge of the Light Brigade

- Cannon to right of them,
- Cannon to left of them,
- Cannon in front of them
- Volley'd and thunder'd;
- Storm'd at with shot and shell,
- Boldly they rode and well,
- Into the jaws of Death,
- Into the mouth of hell
- Rode the six hundred.



# The Charge of the Light Brigade

- Flash'd all their sabres bare,
- Flash'd as they turn'd in air
- Sabring the gunners there,
- Charging an army, while
- All the world wonder'd.
- Plunged in the battery-smoke
- Right thro' the line they broke;
- Cossack and Russian
- Reel'd from the sabre-stroke
- Shatter'd and sunder'd.
- Then they rode back, but not,
- Not the six hundred.

# The Charge of the Light Brigade

- Cannon to right of them,
- Cannon to left of them,
- Cannon behind them
- Volley'd and thunder'd;
- Storm'd at with shot and shell,
- While horse and hero fell,
- They that had fought so well
- Came thro' the jaws of Death,
- Back from the mouth of hell,
- All that was left of them,
- Left of six hundred.

# The Charge of the Light Brigade

- When can their glory fade?
- O the wild charge they made!
- All the world wonder'd.
- Honor the charge they made!
- Honor the Light Brigade,
- Noble six hundred!

- *by Alfred, Lord Tennyson*

# DataBase people

- [The Charge Of The Light Brigade 1968](#)
- Me - Calin CENAN (10 min.)
- You (11 min.)

# DataBase

C.J. Date, Ramakrishnan, ...

- ...
  - [Manele: Whisky si Red Bull](#)
  - ...
- ...
  - Computer Science
  - E. Cebuc, M. Ivan, M. Joldos, T. Dadarlat ...
  - ...

- DataBase vs rest of (Object Oriented) Computer Science

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