STRUCTURED QUERY LANGUAGE
January-February 2018

Zagir Gatin
zagir.gatin@gmail.com

Course description

The course goals are to:
- give overview on modern database technologies;
- give basic theory in database modelling and SQL;
- provide practical skills about single table queries and the basic syntax of the SQL as well as database design with multiple tables, foreign keys, and the JOIN operation
- obtain practical experience in modelling different industries and working with data using SQL

Course requirements, grading, and attendance policies

The course grade is based on homework assignments (60%), group project (20%) and personal mini project (20%). Active class participation may contribute to the grade when it is on the margin (note that quality rather than quantity of your interventions will count).

The typical student will use a laptop running MacOX, Windows, or Linux.

Prerequisites: No prior experience required, basic computer skills only.

Course contents

Class 1: introduction, database design
- Goals of the course
- Overview of data technologies and problems that are solved by using them
- RDBMS
- SQL vs NoSQL
- Database design

Class 2: select operator
- Data types
- Basic functions
- "Select" structure
  - Basic queries
  - Case when queries
  - Group by and sort queries
- NULL values
- Views

 Class 3: using subqueries and joining tables
- Subqueries
- Joining tables/queries

- Union of tables/queries

Class 4: more complex problems:
- Analytical functions
- Modifying data (insert, update, delete, merge)
- Typical SQL problems

Class 5: optimization, recommendations for writing AQL queries
- Basics of RDBMS architecture (Oracle)
- Indexes
- Partitioning
- Query plan
- Database statistics
- Hints

Class 6: advanced section
- Truncate vs Delete
- Privileges and Grants
- Functions, Procedures and Packages
- Triggers

Class 7: combining all the skills in a group project

Course materials

All materials will be provided during lectures.

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.