# Homework: Database Systems Overview

This document defines the homework assignments from the ["OOP" Course @ Software University](https://softuni.bg/trainings/coursesinstances/details/8). Please submit as homework a single zip / rar / 7z archive holding the solutions (source code) of all below described problems. The solutions should be written in C#.

## What database models do you know?

Perform a research (e.g. in Google or Wikipedia) and provide information about different type of database models. Provide detailed information about one of the database models by your choice different than relational model. Write in a text file called “**database-models.txt**”. Use English.

## Which are the main functions performed by a RDBMS?

Perform a research (e.g. Google or Wikipedia) and provide information about relational database management systems and which are their main functions. Write in a text file called “**rdbms-functions.txt**”. Use English.

## Define what is “table” in database terms.

Perform a research (e.g. Google or Wikipedia) and provide information about database table. What is table? How information is stored in tables? What is the difference between tables and relations? Write in a text file called “**table.txt**”.

## Explain the difference between a primary and foreign key.

Perform a research (e.g. Google or Wikipedia) and provide information about primary and foreign keys. What is the primary key? Why do we need it? What is the foreign key? What is the purpose of foreign keys? What is the difference between a primary and foreign key? Write in a text file called “**difference-primary-foreign-key.txt**”.

## Explain the different kinds of relationships between tables in relational databases.

Perform a research (e.g. Google or Wikipedia) and provide information about table relationships in relational databases. Provide more information about every relationship. Write in a text file called “**relationships.txt**”.

## What is a certain database schema normalized?

Perform a research (e.g. Google or Wikipedia) and provide information about database normalization. There is a lot of information about database normalization in web. Write in a text file called “**database-normalization.txt**”.

## What are the advantages of normalized databases?

Perform a research (e.g. Google or Wikipedia) and provide information of what we gain by normalization of databases. Write in a text file called “**database-normalization.txt**”.

## What are database integrity constraints and when are they used?

Explain the database integrity constrains. What are the constraint types? When are the used? Provide definition for all of them. Write in a text file called “**integrity-constraints.txt**”.

## Point out the pros and cons of using indexed in a database?

Perform a research (e.g. Google or Wikipedia) and provide information about indexes. What is index? What indexing methods exist? How indexes work and what are the pros and cons of using them? Write in a text file called “**indexes.txt**”.

## What’s the main purpose of the SQL language?

Perform a research (e.g. Google or Wikipedia) and provide information about SQL language. What type of language is SQL? What is used for? Provide an example with simple SQL query. Write in a text file called “**sql.txt**”.

## What are transactions used for? Give an example.

Perform a research (e.g. Google or Wikipedia) and provide basic information about transactions and what are they used for? Write in a text file called “**transactions.txt**”.

## What is a NoSQL database?

Perform a research (e.g. Google or Wikipedia) and provide information about non-relational databases? Give a few examples of NoSQL databases. Write in a text file called “**nosql.txt**”.

## \*Try to install SQL Server and MySQL. Play with RDBMS.

Try to install SQL Server. You can follow instructions from this video <https://softuni.bg/trainings/1045/First-steps-with-Microsoft-SQL-Server>. Try to create new user and login with created user. Try to create new database with few tables. You can try the same with MySQL.