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Tutorial 2: NoSQL

Assignment 2-1   *CAP theorem*

First recap the DB-systems which are allowed by the CAP theorem. Then determine for the following Database systems which of the requirements are fulfilled:

(a) At a cloud-service provider the data is distributed among many, but not fail-safe nodes. They shall be always available for the customer.

(b) A larger bank has per city several ATMs. At the ATMs each of the performed transactions must be stored accurately on the database, even if the data transfer is interrupted.

(c) Given a social network. It is important that once submitted posts are not again deleted. Further the posts shall be accessible by its users.

(d) On the website of a hotel, the customers can book a room online. Double bookings shall be excluded, as far as possible.

(e) A news agency publishes on its website articles on a regular basis. The website shall be always kept up-to-date, as far as possible.

Assignment 2-2   *MongoDB*

In this assignment you are going to become a bit more familiar with the document orientated NoSQL database MongoDB

(a) Comparing RDBMS like MySQL to the document database MongoDB: What are the pendants of a database, a table, a row, an index and of a join in MongoDB?

(b) Download and install MongoDB Community Edition. An installation manual and tutorial can be found on https://docs.mongodb.com/manual/

(c) Create a database named *mydb*

(d) Add to the database a **collection** named *city* by inserting first a **document** with the following **fields** and its corresponding *values*: The city *name* is *Munich*, its *population* is *1450381*, it is *famous for* a *list* of things, such as e.g. the *Frauenkirche*, the *LMU* and the *Oktoberfest*. The document has another **document** in it which describes a *mayor*. The mayor document has a **field** of its *name Dieter Reiter* and the *party* he belongs to which is the *SPD*.

(e) Add to the city collection another place. The city name is Berlin, its population is 3520031. It is famous for a list of things such as Brandenburger Tor, Reichstag building, and Charlottenburg. It also has a mayor document with the mayor name Michael Müller and the party he belongs to (SPD).

(f) Search in your city collection for a place which has a population larger than three million.

(g) Search for all cities whose mayor are from the SPD party.

(h) What is a Replication in MongoDB?