Data modelling

"Data model"

Which tables are there and which columns do they have?

Data types

- In Java
- In MySQL

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Data types in MySQL

- Numeric
- Date and Time
- Strings

Numeric Data Types in MySQL

- Integer
- Fixed Point
- Floating Point

Integer Data Types in MySQL

Type	Storage (Bytes)	Minimum Signed	Minimum Unsigned	Maximum Signed	Maximum Unsigned
TINYINT	1	-128	0	127	255
SMALLINT	2	-32768	0	32767	65535
MEDIUMINT	3	-8388608	0	8388607	16777215
INT	4	-2147483648	0	2147483647	4294967295
BIGINT	8	-2^{63}	0	2^{63-1}	2^{64-1}

Fixed Point Data Types in MySQL

`DECIMAL(M, N)`

M = Precision

N = Scale

e.g. `DECIMAL(5,2)` from -999.99 to 999.99.

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Floating Point Data Types in MySQL

FLOAT and **DOUBLE**

analog to Java

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Data Types for Date and Time in MySQL

DATE: '1000-01-01' to '9999-12-31'

DATETIME: like `DATE`, but with time (seconds precision)

TIMESTAMP: '1970-01-01 00:00:01' to '2038-01-19 03:14:07'

TIME: '-838:59:59' to '838:59:59'

Attention: Saved in UTC, but read and written in server timezone

String Data Types in MySQL

- Find the chapter "String Types" in MySQL 8.0 Reference Manual
- Which types are useful for arbitrary, user-generated text?
- What is the maximum size of thse types?
- Fot a table of blog entries, which type would you use for the text of the entries?

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String Data Types in MySQL

- CHAR(L) and VARCHAR(L)
  - Maximum of 64kB
- TEXT
  - unlimited length
- Character Set: Which letters are there? How are they encoded?
- Collation: Comparison of text, e.g. for sorting

Other Types in MySQL

- Spatial: GEOMETRY, POINT, ...
- JSON

Repetition: Relations

- One to One (usually can be normalized away)
- One to Many
- Many to Many

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Entity

Thing, Being

Objects, Properties, Relations, Facts, Events relevant for your software

→ Every type of entity gets its own table

Entity Relationship Diagram

Graphical representation of the types of entities, their attributes and relationships

[Entity–relationship model - Wikipedia](#)

There can be very strict rules regarding notation, e.g. by Peter Chen

For today: If you understand it yourself, it's OK

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Data Modelling: Blog

- Read the User Stories document.
- What are the entities?
- How are the entities connected? Draw an ER diagram.
- What are the attributes of the entities?
- Check whether all data relevant to the user stories has a place.

Bonus: Create the tables in a new database and fill them with sample data.