

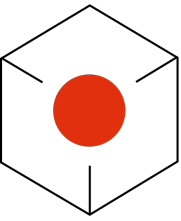
The Educational Conference For Oracle Technology Users

ODTUG
Kscope23
aurora, co june 25-29

Welcome

Data Modelling Puzzle

Dr. Andrea Kennel
InfoPunkt Kennel GmbH
Dübendorf-Schweiz
Summer 2023



Dr. Andrea Kennel



Consultant

Lecturer for Database

Coach for Project Management

University of Applied Sciences

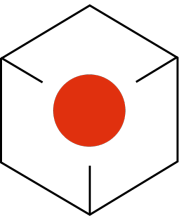
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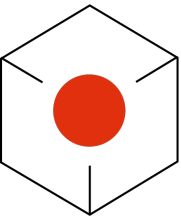


Basic Patterns of Data Modelling

dept		
deptno	dname	loc
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON



emp							
EMPNO	ENAME	MGR	HIREDATE	SAL	COMM	DEPTNO	JOB
7369	SMITH	7902	17.12.80	800		20	CLERK
7499	ALLEN	7698	20.02.81	1600	300	30	SALESMAN
7521	WARD	7698	22.02.81	1250	500	30	SALESMAN
7566	JONES	7839	02.04.81	2975		20	MANAGER
7654	MARTIN	7698	28.09.81	1250	1400	30	SALESMAN
7698	BLAKE	7839	01.05.81	2850		30	MANAGER
7782	CLARK	7839	09.06.81	2450		10	MANAGER
7788	SCOTT	7566	09.12.82	3000		20	ANALYST
7839	KING		17.11.81	5000		10	PRESIDENT
7844	TURNER	7698	08.09.81	1500	0	30	SALESMAN
7876	ADAMS	7788	12.01.83	1100		20	CLERK
7900	JAMES	7698	03.12.81	950		30	CLERK
7902	FORD	7566	03.12.81	3000		20	ANALYST
7934	MILLER	7782	23.01.82	1300		10	CLERK



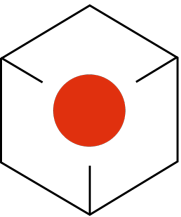
Basic Patterns of Data Modelling

1 to many



A beer is a kind of beer style

Grouping or categorizing



Basic Patterns of Data Modelling

many to many

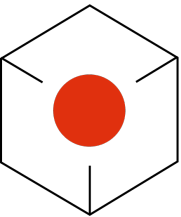


There are several brew teams. A brewer can work in different teams and a team has normally more than one brewer.

Brew Team		
TeamNr	name	first_brewed
101	The monsters	1996
102	The wiches	2020
103	The neighbors	2021

Brewers			
BrewerNr	name	gender	location
201	Dani	male	Dübendorf
202	Andrea	female	Dübendorf
203	Francine	female	Dübendorf
204	Rahel	female	Bamberg
205	Dieter	male	Bamberg
206	Maggy	female	Zürich
207	Ben	male	Zürich

The monsters	Dani
	Andrea
The wiches	Andrea
	Francine
	Rahel
	Maggy
The neighbors	Maggy
	Ben



Basic Patterns of Data Modelling

many to many

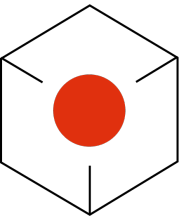


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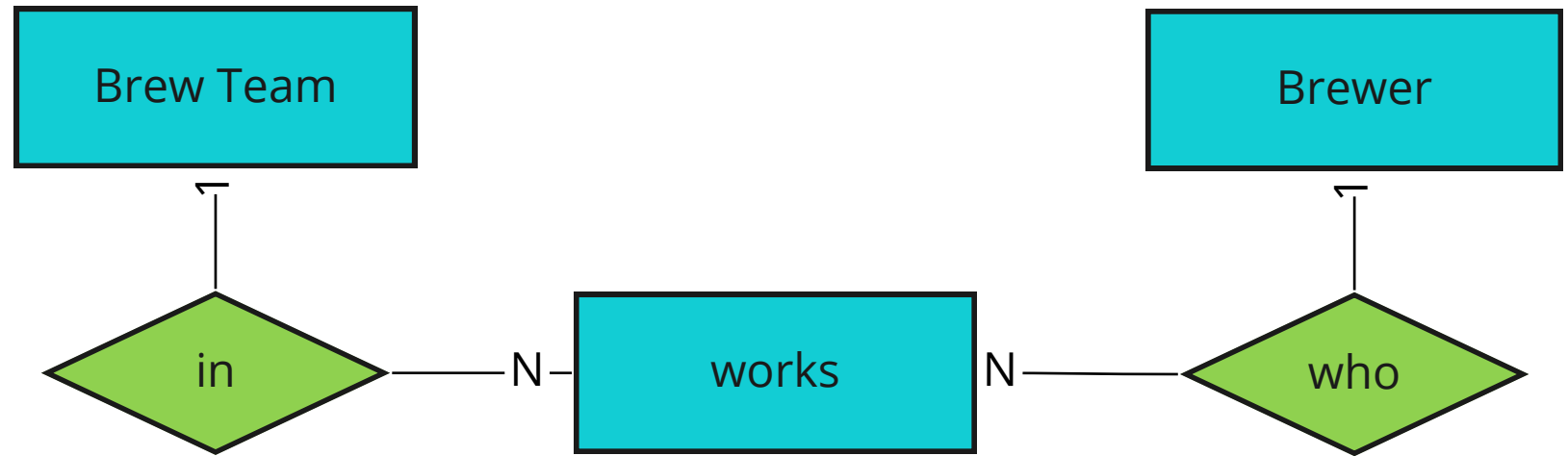
TeamNr	BrewerNr
101	201
101	202
102	202
102	203
102	204
102	206
103	206
103	207

The monsters	Dani
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The wiches	Andrea
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Basic Patterns of Data Modelling

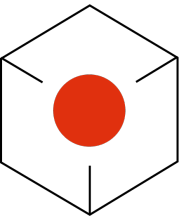
many to many



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101	202
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102	203
102	204
102	206
103	206
103	207

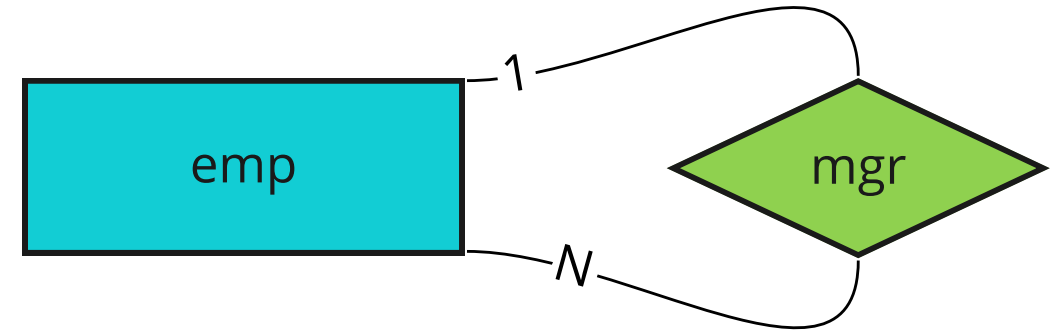
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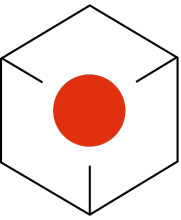
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**1 to many
self relationship**

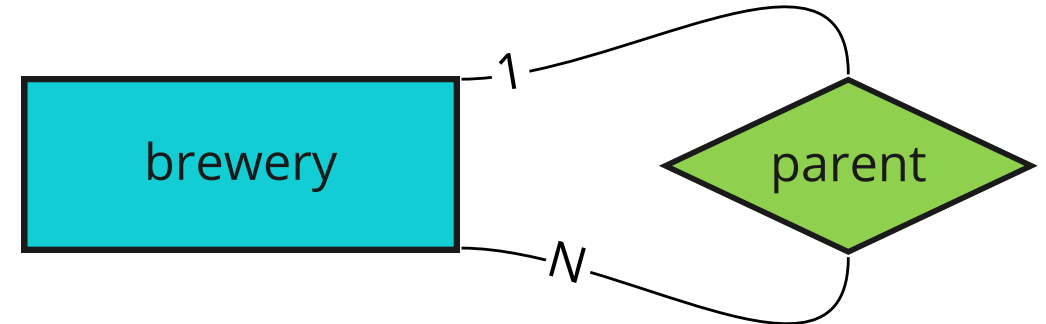


Basic Patterns of Data Modelling

I asked ChatGPT:

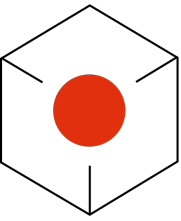
Do you have an example in a brewery?

Certainly! Let's consider a scenario where we have a table called "Breweries" in a relational database, and we want to establish a self-relationship to represent the ownership hierarchy within breweries. Here's an example schema for the "Breweries" table:



BreweryID	BreweryName	Location	ParentBreweryID
1	BrewCo	City A	NULL
2	Crafty Brew	City B	1
3	Hoppy Acres	City C	1
4	Indie Brew	City D	3

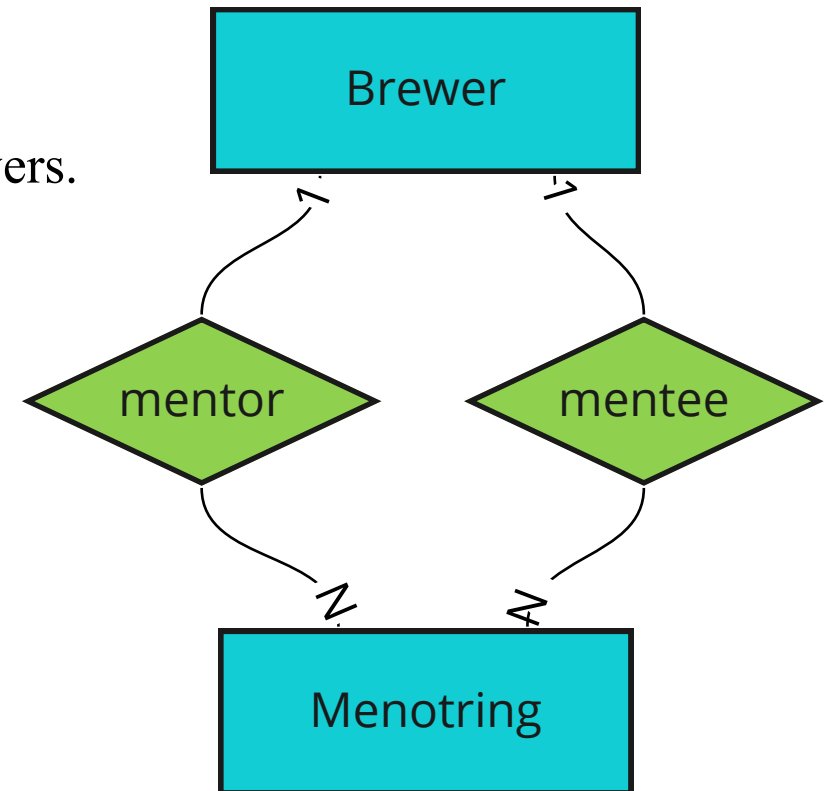
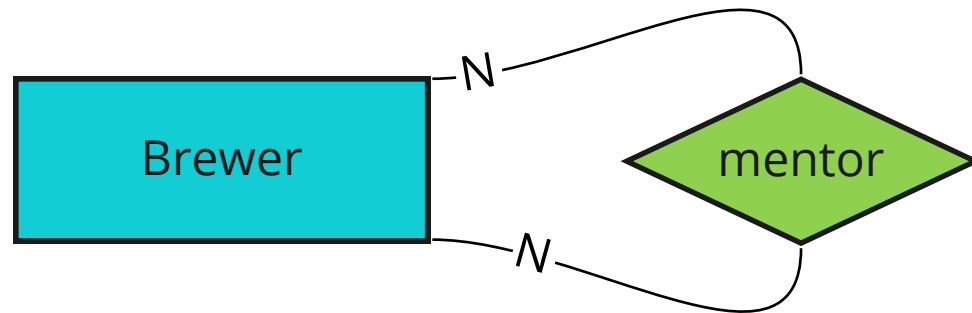
In this example, the "BreweryID" column serves as the primary key for each brewery. The "ParentBreweryID" column establishes the self-relationship within the table by referencing the "BreweryID" of the parent brewery.

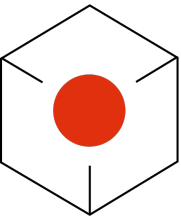


Basic Patterns of Data Modelling

many to many Self relationship

Each brewer can have one or several mentors.
At the same time he or she can be mentor of several other brewers.





Basic Patterns of Data Modelling

A question we are often asked:
Who buys your beer?

The answer:
We have some bars, restaurants and shops, that sell our beer and we have private individuals, that buy our beer.

The customers **can be** persons or resellers.

A person **is a** customer

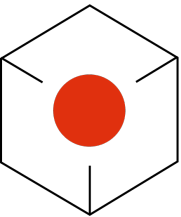
A reseller **is a** customer

**IsA or
Generalisation/Specialisation**

Customer is the generalisation

Person is a specialisation of customer

Reseller is a specialisation of customer



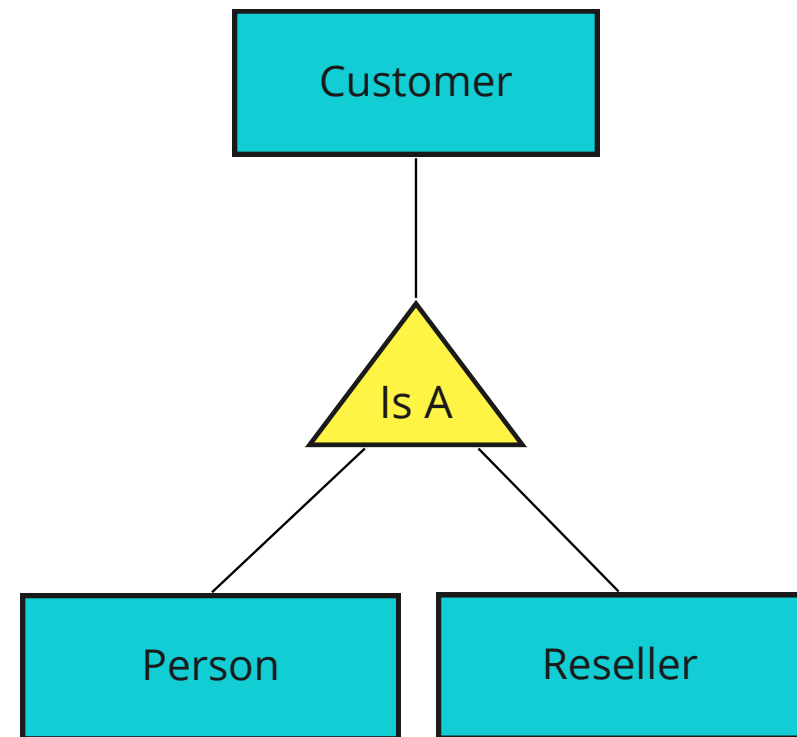
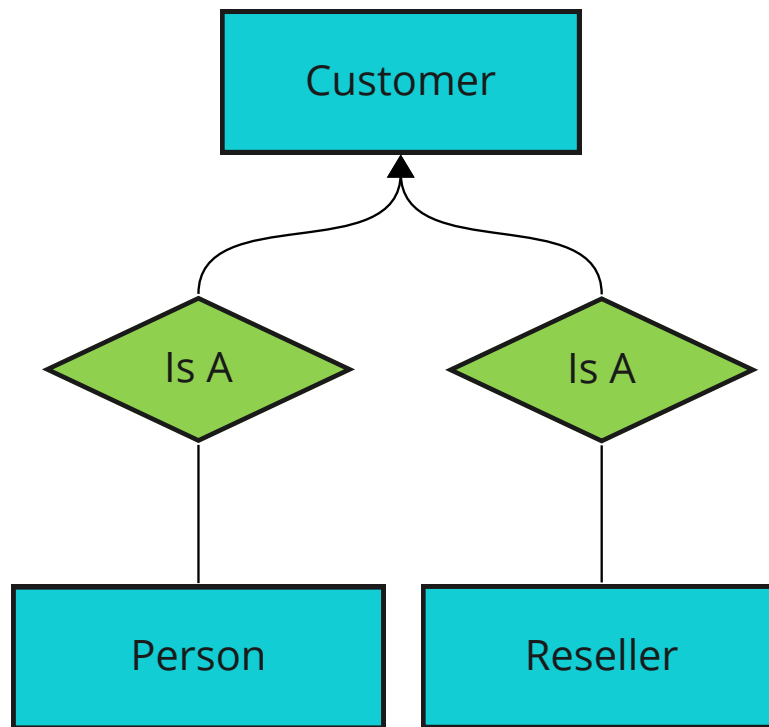
Basic Patterns of Data Modelling

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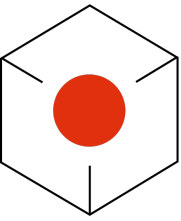
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Two possible notations



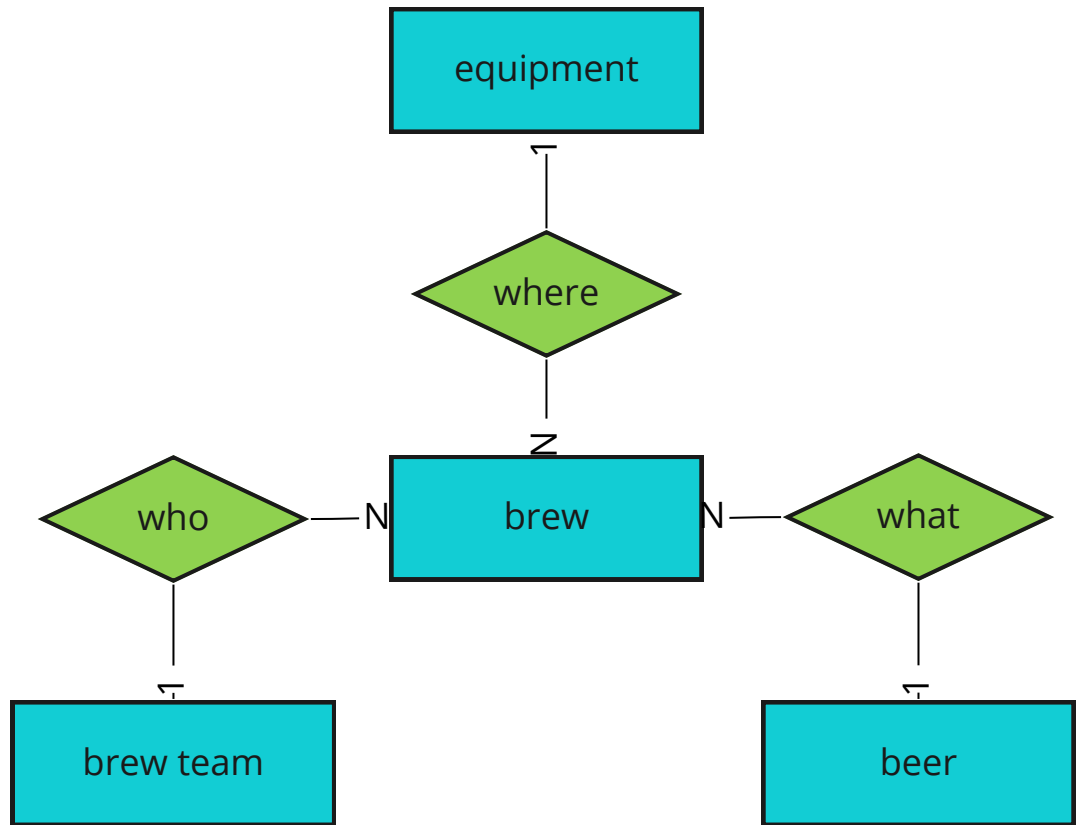
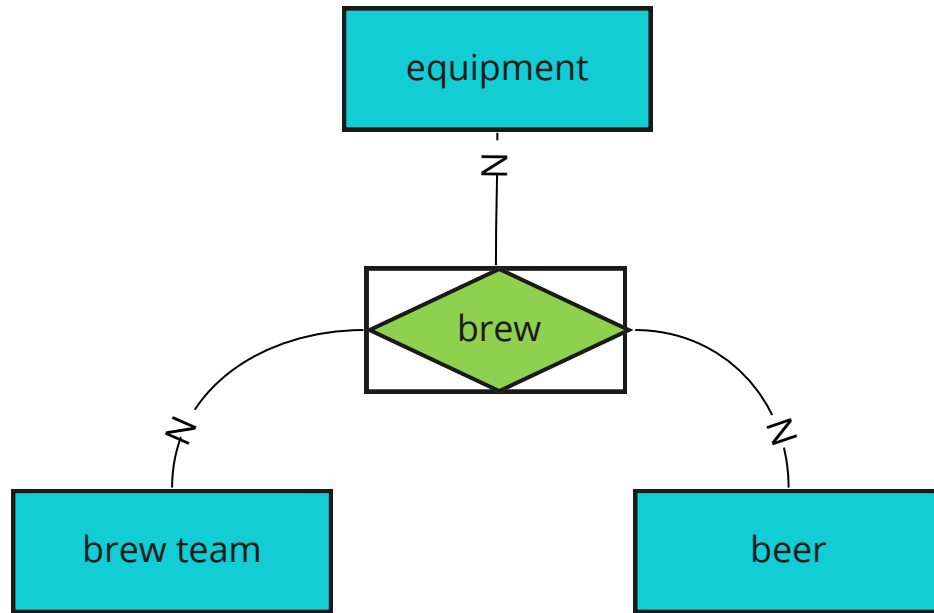
Source: http://bit.csc.lsu.edu/~chen/pdf/ER_C.pdf

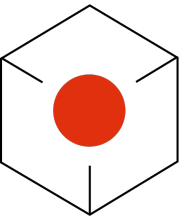
Source: <https://jcsites.juniata.edu/faculty/rhodes/dbms/eermodel.htm>



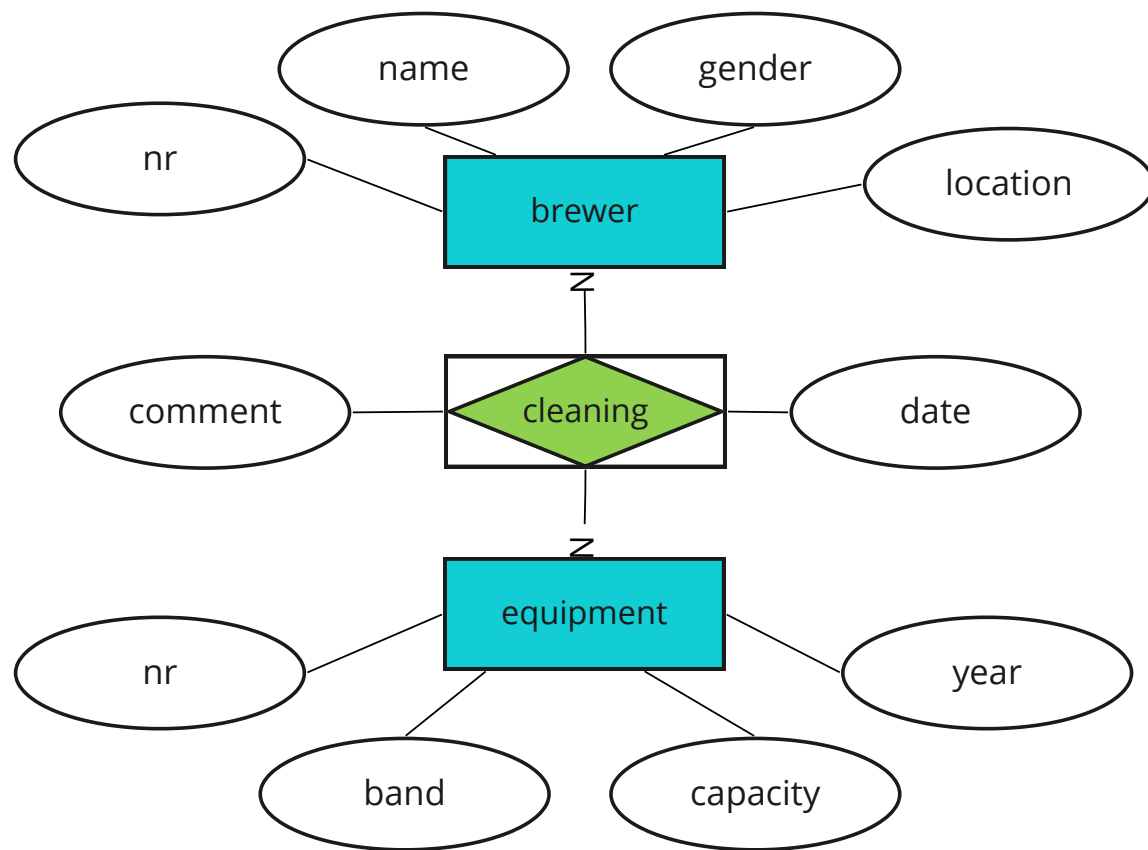
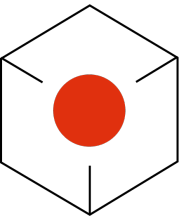
Basic Patterns of Data Modelling

Complex relationship or many-to-many-to-many relationship

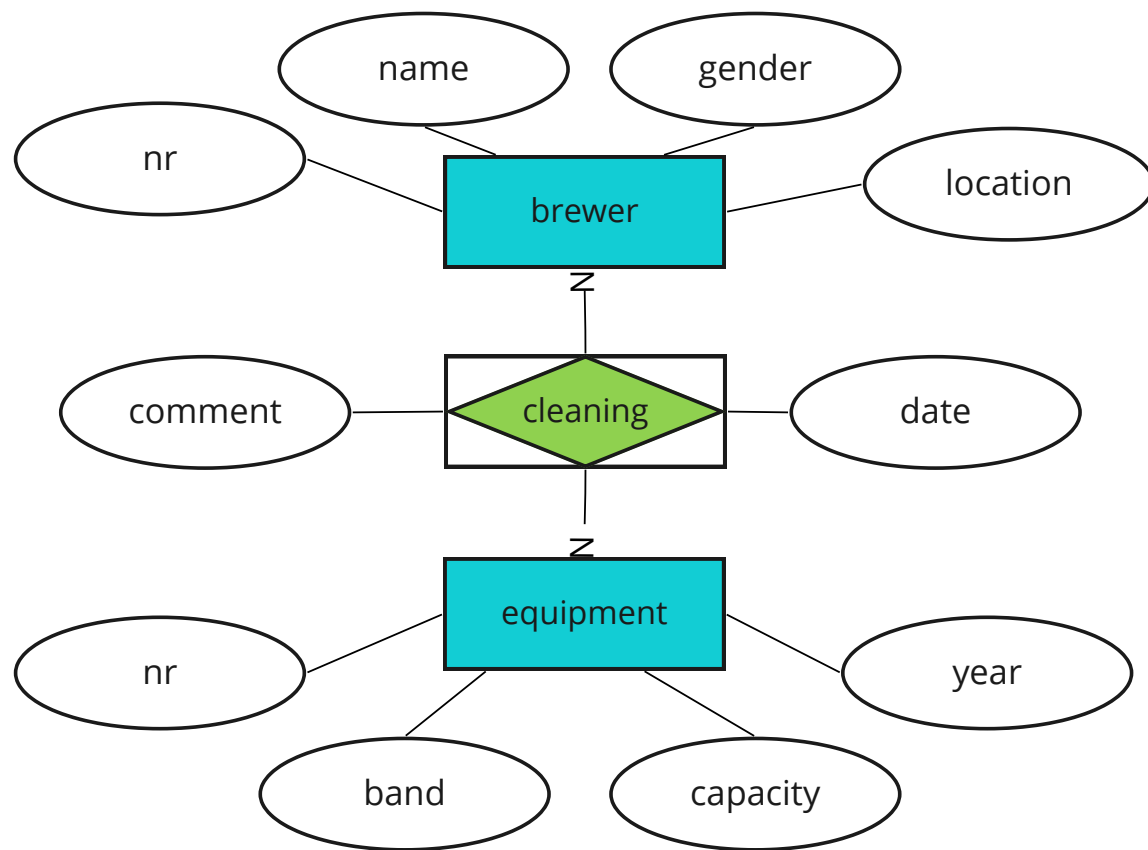
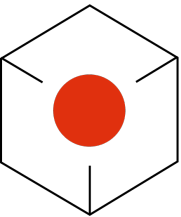




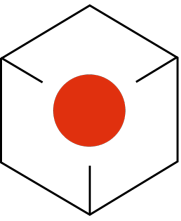
And where are the
attributes
?



- A brewer has a number, a name, a gender and a location
- An equipment has a number, a brand, a capacity and a year
- A brewer cleans several equipments and a equipment is cleaned by several brewers
- Each cleaning is at one date and can have a comment



- An entity has a name and can have attributes
- Relationships normally do not have attributes
- A relationship with attributes or with many-to-many can be called an associative entity



Further links

Modeling the Information of an Enterprise Using Chen's Entity/Relationship Model and Diagrams

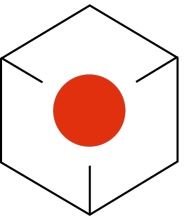
https://www.inf.usi.ch/faculty/soule/teaching/2014-spring/02_Modeling_Enterprise_With_ER_Diagrams.pdf

Overview of all the possible elements in CHEN notation

<https://vertabelo.com/blog/chen-erd-notation/>

5 Foundational Design Patterns for Data Modelling

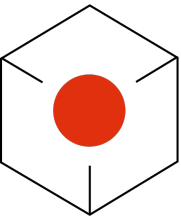
<https://martinterhaak.medium.com/data-modeling-design-patterns-part-1-3fbd45a8392>



Now let's puzzle

https://miro.com/app/board/uXjVP8ysqbQ=





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