TU München, Fakultät für Informatik
Lehrstuhl III: Datenbanksysteme
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Database System Concepts for Non-Computer Scientist – **WiSe 20/21**

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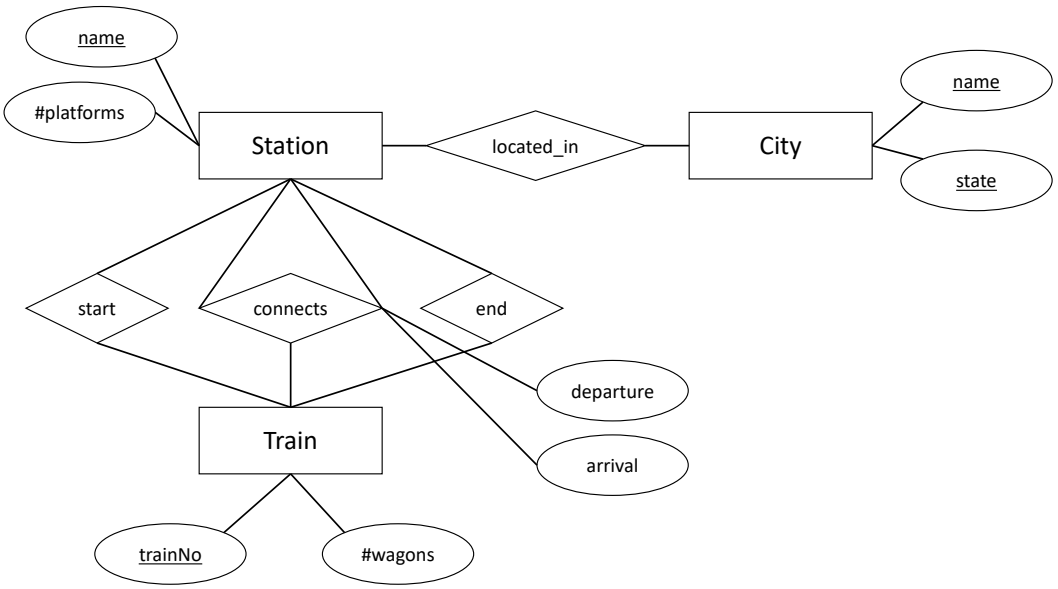
http://db.in.tum.de/teaching/ws2021/DBSandere/?lang=en

Sheet 02

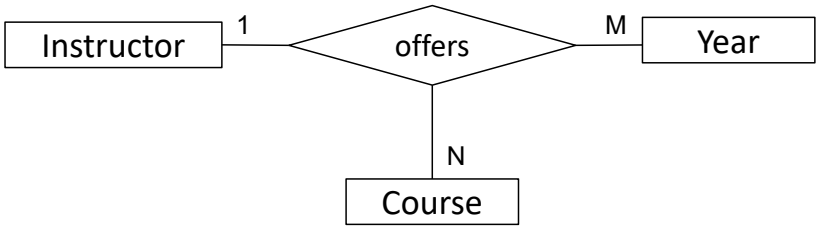
Exercise 1

Consider the entity relationship model of a train connection system (below). Note: The `connects` relationship models a direct connection between two stations. For example, the train starting (`start`) in Munich and ending (`end`) in Hamburg passes through several stations. Each of these route-sections (e.g., Munich → Nürnberg or Nürnberg → Würzburg) has an entry in the `connects` relation. Further, the train entity models a train line: The train line going from Munich to Hamburg, becomes a different train line (different *trainNo*) when returning.

Task: Add functionalities to the shown ER diagram.



Exercise 2



For now, ignore the functionalities in the diagram and answer the following questions:

- How many partial functions ($A \times B \to C$) are possible in a ternary relationship (ignore permutation on the left side of the partial function when counting).
- List **all** possible partial functions of the „offers“ relationship.
- For each partial function, try to describe in natural language which constraints it would enforce (not all of them make sense in the real world).

Now, considering the functionalities:

- Which partial function actually hold?
- What does the absence of the other partial functions allow for? (no need to create an exhaustive list).