What is DATABASE?
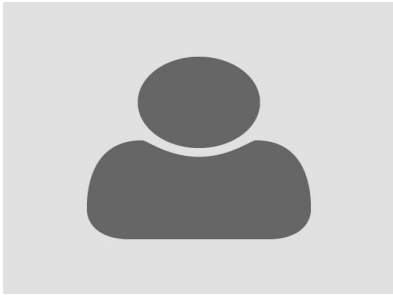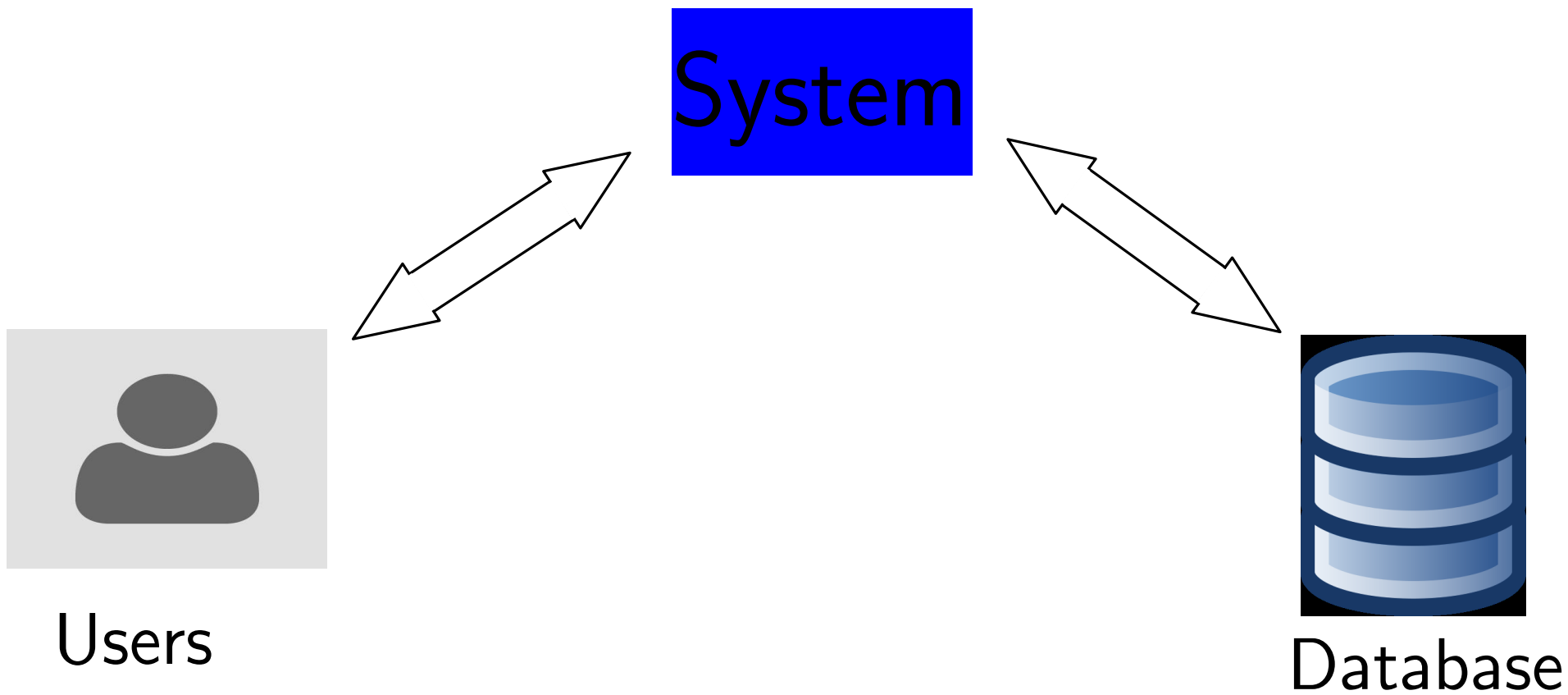
A database is an organized collection of data, stored and accessed electronically from a computer system.
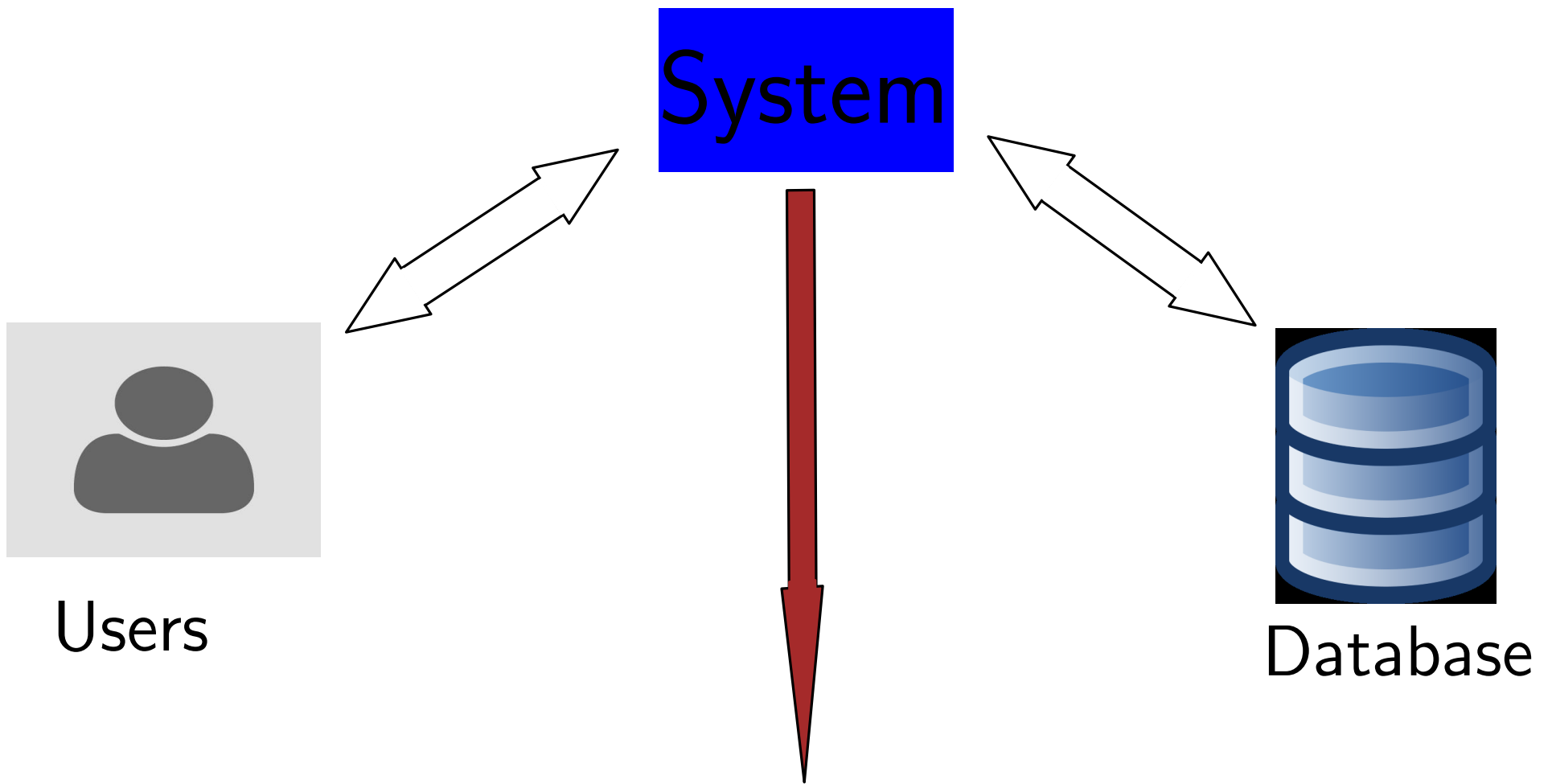
Users

Database

System
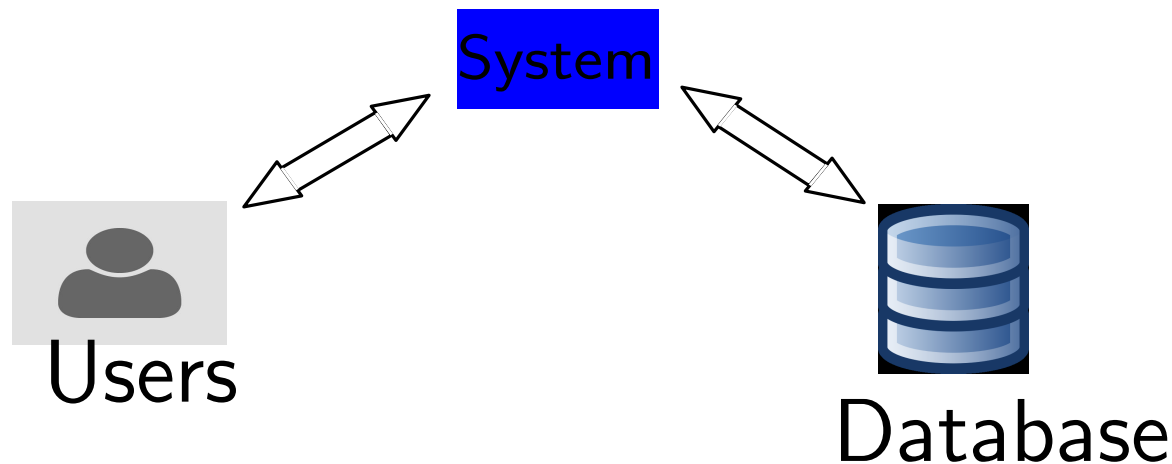
Users

Database

Database management system (DBMS)

Definition: software system that enables users to define, create, maintain and control access to the database

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Example: Database at Polytech

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- For every course, we store `ID number`, `name`, `start and end dates` and a `short description`.

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What is the best way to store those infos?

- files?, many problems... dificult to find and modify information
- Excel? better, but has limited options and storage

Example: Database at Polytech

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Students			
ID	Name	Adress	Birth

Courses			
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ID	Name	Adress	Birth

$$\frac{\text{Student } S}{\text{takes course } C}$$

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ID	Name	Date	Description
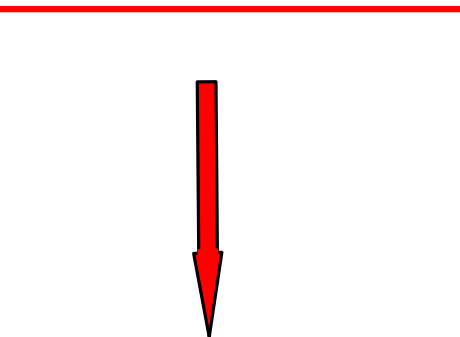
Example: Database at Polytech

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What will we learn here:

- Dealing with Rational Database:
  - Creating
  - Querying
  - Updating
  - Deleting

- Designing Databases (creating efficient DB)
- Rational Algebra (for querying even complex)

What will we learn here:

SQL

MySql
Workbench

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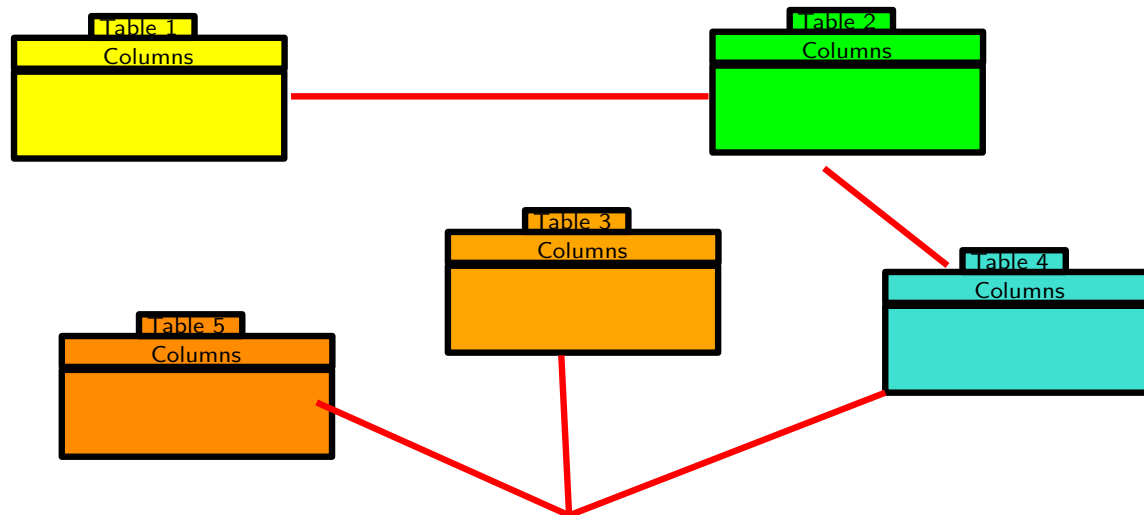- Rational Algebra (for querying even complex)
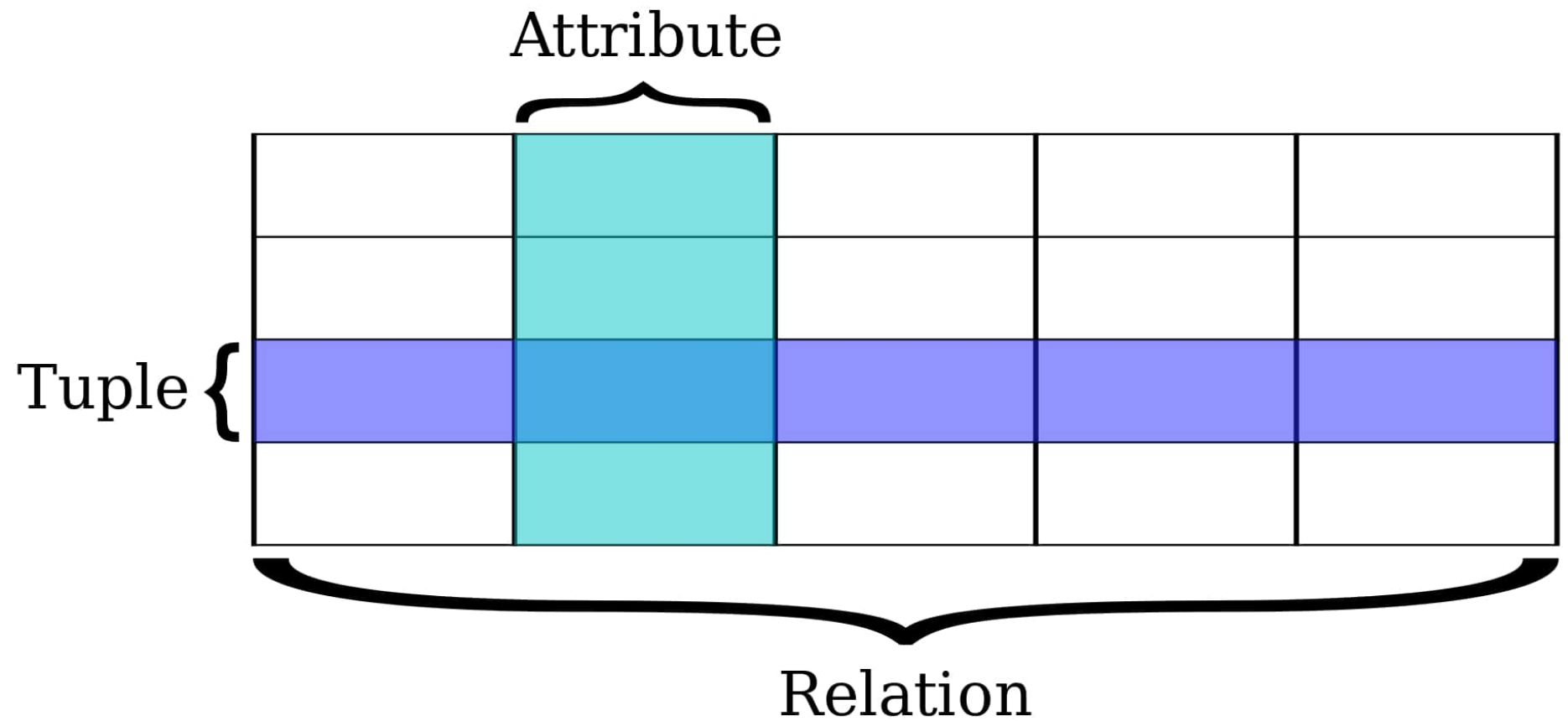
More general: Relational model
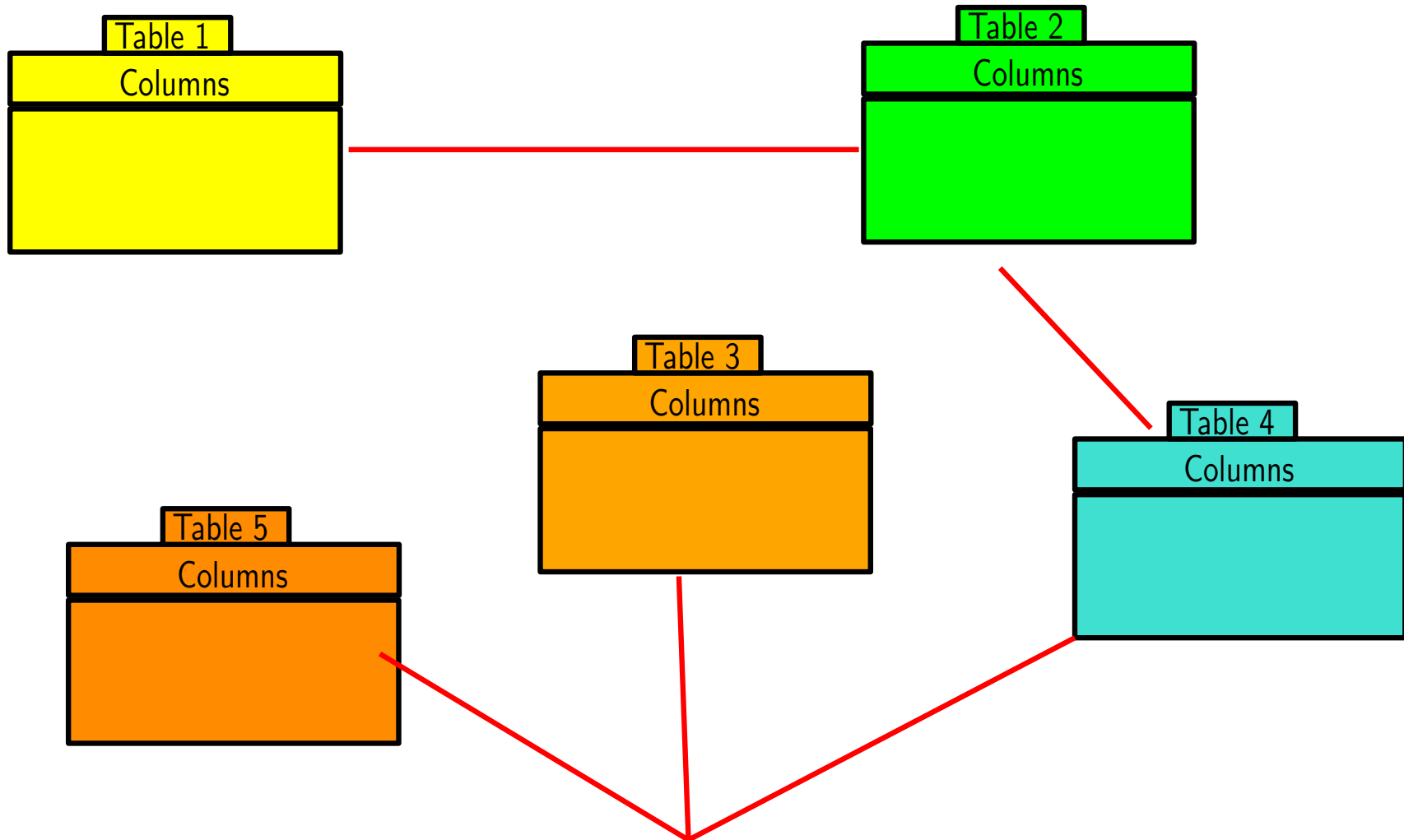
More general: Relational model of Database

Rational model: This model organizes data into one or more tables (or "relations") of columns and rows, with a unique key identifying each row.

Notiation

Exercise:

Find a rational module that satisfies the following:

A company wants to make a database system that includes the following:
- The company has several branches. Every branch has ID, city name (in which the branch is).
- Every employee has an ID, name, first name, salary.

Employee			
ID	Name	$1st$ Name	Salary

Branche	
ID	City

Exercise:

Find a rational module that satisfies the following:

A company wants to make a database system that includes the following:

- The company has several branches. Every branch has ID, city name (in which the branch is).
- Every employee has an ID, name, first name, salary.
- Every branch has a chef (who is an employee).

Employee			
ID	Name	$1st$ Name	Salary

Branche		
ID	City	Chef