

# Relational Data Model

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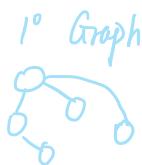
- $\begin{cases} \text{query language} & \text{the aspect of a data model that enables us to ask a question about data} \\ \text{constraint language} & \text{restrict database} \end{cases}$

- data model: a mathematical formalism for describing data

- description  $\begin{cases} \text{Structure of data} \\ \text{Operations on data} \\ \text{Constraints on data} \end{cases}$

- important data models  $\begin{cases} \text{relational model} & \text{object-relational extensions} \\ \text{based on table} & \\ \text{semi-structured-data model (Json)} & \\ \text{based on tree, graphs, XML and related standards} & \\ \text{key-value pairs NoSQL} & \end{cases}$
- other models: hierarchical model, network model  
tree-oriented model graph-oriented  
graph, object-oriented

e.g. store FB friends



2° relation

person1	person2	is-friend

- Relation: a two dimensional table.

Movies

titles	year	length	genre



name	2011	150	Comedy
:	:	:	:

tuple

- **Attributes**: columns of relation.  
(fields)

e.g. titles, years, lengths, genres

- **schema** { for relation e.g. Movies(title, year, length, genre)  
(type) instance as value for database

- **Tuples** rows of a relation, other than headers.

- Always use the order in which the attributes were listed in the relation schema.

- **domain** : each elementary type is a domain. (every attribute has a type)

Movies(title: String, year: Integer, length: Integer, genre: String);

- **Relation instance** : a set of tuples or a given relation is an instance of that relation.

- current instance : the set of tuples that's in the relation "now"

- **key** a set of attributes forms a key for a relation if no duplicate tuples are permitted.  
each tuple can be identified if only has the key.

e.g. Movies(title, year, length, genre)

here we say title & year form a key constraint

- multi attribute keys...

- ## - insurance key

values can't be all the same

- Foreign key (is not a key!) semantic pointer

→ defined in a second table, but refers to key in second table.