

### Data model

A **data model** is a notation for describing data information

3 parts:

- **Structure** of data
- **Operations** on the data.
- **Constraints** on the data
  - Limitations on what can be stored (e.g. datatype).
  - Domain specific (e.g. student id)

### Relational model

- **Structure.**

Based on relations / tables

title	year	genre
Terminator	1984	Action
Alien	1979	Horror

## • Operations

- Based on Relational Algebra (implemented in SQL)

## • Constraints

- Year between 1984 and 2015
- Genre in a given set

Much more later.

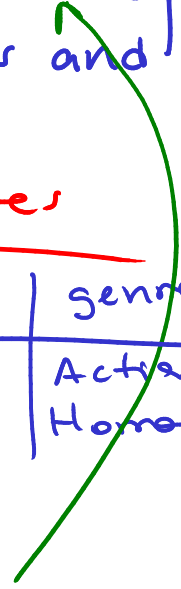
## Basics of Relational Model (2.2)

- Data represented as a 2-dim. table called **relation**
- A relation represents a **set** of objects/entities/elements and their relations.

Movies:

Attributes		
title	year	genre
Terminator	1984	Action
Alien	1979	Horror

Tuples {



No order and No duplicates

## Schema

- Represents the characteristics of a relation: **name** and **attributes**

Movies(title, year, genre)

## DB Schema

- Set of schemas of all relations in the DB.

## Some properties of relations

- every tuple is unique
- every attribute
  - must have a **domain**
  - must be **atomic** (no lists, sets, etc).

## Domain

- Set of potential values an attribute can take.

## Instance

The "current" set of "values" in the relation/db.

## Keys

- One of the most important types of constraints.
- A **primary key** is a set of attributes of a relation  $R$  s.t. two tuples in  $R$  cannot have the same values in these attributes.
- Allows to uniquely identify a tuple in a relation
- What is a good primary key for the Movies relation?
- Underscoring the attr. in Schema:  
 $\Rightarrow$  part of the primary key  
Movies (title, year, genre)

## Artificial Primary Keys

- Attributes created specifically for the purpose of uniquely identifying a tuple in a relation.