

Relational Model and Algebra

Introduction to Databases

CompSci 316 Fall 2017

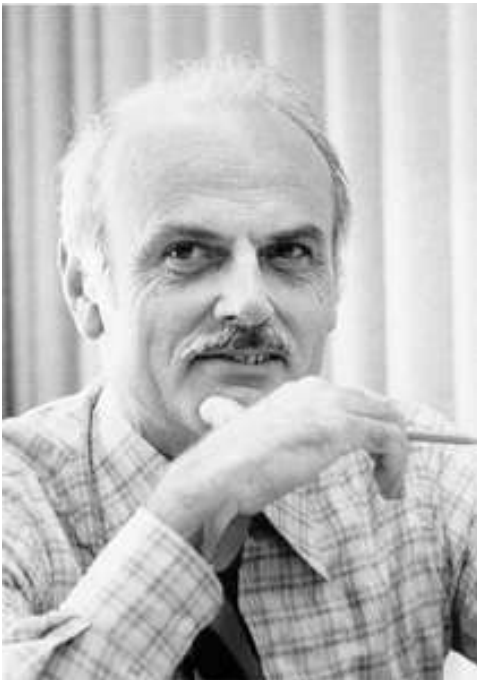


DUKE
COMPUTER SCIENCE

Announcements (Tue. Sep. 4)

- Registration: class size will stay at 140; as a courtesy to others, please add/drop ASAP
- Homework #1 to be posted today; due in 2 weeks
 - Sign up for Piazza & Gradiance
 - Set up VM (instructions on course website)
- TA/UTA office hours to be posted soon

Edgar F. Codd (1923-2003)



- Pilot in the Royal Air Force in WW2
- Inventor of the relational model and algebra while at IBM
- Turing Award, 1981

Relational data model

- A database is a collection of **relations** (or **tables**)
- Each relation has a set of **attributes** (or **columns**)
- Each attribute has a name and a **domain** (or **type**)
 - Set-valued attributes are not allowed
- Each relation contains a set of **tuples** (or **rows**)
 - Each tuple has a value for each attribute of the relation
 - Duplicate tuples are not allowed
 - Two tuples are duplicates if they agree on all attributes

☞ Simplicity is a virtue!

Example

User

<i>uid</i>	<i>name</i>	<i>age</i>	<i>pop</i>
142	Bart	10	0.9
123	Milhouse	10	0.2
857	Lisa	8	0.7
456	Ralph	8	0.3
...

Ordering of rows doesn't matter
(even though output is
always in some order)

Group

<i>gid</i>	<i>name</i>
abc	Book Club
gov	Student Government
dps	Dead Putting Society
...	...

Member

<i>uid</i>	<i>gid</i>
142	dps
123	gov
857	abc
857	gov
456	abc
456	gov
...	...

Schema vs. instance

- **Schema (metadata)**
 - Specifies the logical structure of data
 - Is defined at setup time
 - Rarely changes
 - **Instance**
 - Represents the data content
 - Changes rapidly, but always conforms to the schema
- 👉 Compare to **types** vs. collections of **objects of these types** in a programming language

This is a sample, click download link to get the full Tutorial

CLICK BELOW

