CSC343: Introduction to Databases

Winter 2019

Summary: The Relational Data Model

- A method for representing data
- Main concept is a **relation** → a table

Col: attribute

Row: tuple

Relation

Table name

Movies:

mID	title	director	year	length
1	Shining	Kubrick	1980	146
2	Player	Altman	1992	146
3	Chinatown	Polanski	1974	131
4	Repulsion	Polanski	1965	143
5	Star Wars IV	Lucas	1977	126
6	American Graffiti	Lucas	1973	110
7	Full Metal Jacket	Kubrick	1987	156

- **Arity** is the number of …
- **Cardinality**

Summary: The Relational Data Model

- Mathematical representation:

Movies = { <1, Shining, Kubrick, 1980, 146>,
<2, Player, Altman, 1992, 146>, … }

- **Schema:** defines the structure
- **Instance:** particular data in the relation

Integrity Constraints

Superkeys:

- A set of attributes that uniquely identify a tuple
- Formally: if attributes $a_1, a_2, \ldots, a_n$ form a superkey

$$\nexists t_1, t_2 | (t_1.a_1 = t_2.a_1) \wedge (t_1.a_2 = t_2.a_2) \wedge \ldots \wedge (t_1.a_n = t_2.a_n)$$

Integrity Constraints

Key:

- A minimal superkey ➔ a superkey is a superset of some key
- **E.g.** student number

Movies

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Artists

aID	aName	nat
1	Nicholson	American
2	Ford	American
3	Stone	British
4	Fisher	American

Roles

mID	aID	character
1	1	Jack Torrance
3	1	Jake ‘J.J.’ Gittes
1	3	Delbert Grady
5	2	Han Solo
6	2	Bob Falfa
5	4	Princess Leia Organa