Relational Model

Relational model

Relational Algebra

movies

title	year	length	genre
Gone with the wind	1939	231	drama
Star wars	1977	124	sciFi
Wayne's world	1992	95	comedy

Relation = set of tuples (thus no duplicate), has no order

Actual DB / SQL

SQL

movies

title	year	length	genre
Gone with the wind	1939	231	drama
Star wars	1977	124	sciFi
Wayne's world	1992	95	comedy

Table = list of rows (thus can have duplicates), has order

Schema

Schema – logical design of the database (describe the tables), not generally change (note order of attributes)

movies

title	year	length	genre
Gone with the wind	1939	231	drama
Star wars	1977	124	sciFi
Wayne's world	1992	95	comedy

Write a schema statement for the above relation

Instance

Instance – data stored in the database at a given time (set of tuples), change from time to time

movies

title	year	length	genre
Gone with the wind	1939	231	drama
Star wars	1977	124	sciFi
Wayne's world	1992	95	comedy

tuple

instance

Write the selected tuple

Write the selected instance

Keys of Relations

To specify which tuple, use the attribute values of a tuple to distinguish (uniquely identify the tuple)

movies

title	year	length	genre
Gone with the wind	1939	231	drama
Star wars	1977	124	sciFi
Wayne's world	1992	95	comedy

Make use of the real-world fact

Assumption:

Write a schema statement for the above relation, indicate the key of the relation

Super Key – Candidate Key - Primary Key

Super key – any attribute(s) that can uniquely identify a tuple

Candidate key – minimal super key

Primary key – a candidate key that is the most important key

Students_info

computingID	SSN	name
mi1y	111-11-1111	Mickey
mi2e	222-22-2222	Minnie
do3d	333-33-3333	Donald
da4y	444-44-4444	Daisy
do5d	555-55-5555	Donald

Identify super key

Start with assumptions

Super Key – Candidate Key - Primary Key

Super key – any attribute(s) that can uniquely identify a tuple

Candidate key – minimal super key

Primary key – a candidate key that is the most important key

Students_info

computingID	SSN	name
mi1y	111-11-1111	Mickey
mi2e	222-22-2222	Minnie
do3d	333-33-3333	Donald
da4y	444-44-4444	Daisy
do5d	555-55-5555	Donald

Identify candidate key

Super Key – Candidate Key - Primary Key

Super key – any attribute(s) that can uniquely identify a tuple

Candidate key – minimal super key

Primary key – a candidate key that is the most important key

Students_info

computingID	SSN	name
mi1y	111-11-1111	Mickey
mi2e	222-22-2222	Minnie
do3d	333-33-3333	Donald
da4y	444-44-4444	Daisy
do5d	555-55-5555	Donald

Identify primary key

Recap: Keys

List properties of primary keys

Recap: Relational Model

Does the following table satisfy the characteristics of relational model?

id	name	year	country
123	Mickey	1992	USA
456	Minnie	1992	USA
789	Donald	1994	USA
567	Humpty	2016	USA
567	Humpty	2016	USA

Recap: Relational Model (2)

Does the following table satisfy the characteristics of relational model?

id	name	year	country
123	Mickey	1992	USA
456	Minney	1992	USA
789	Donald	1994	USA
567	Humpty	banana	USA

Recap: Relational Model (3)

Does the following table satisfy the characteristics of relational model?

id	name	year	country
123	Mickey	1992	country: note USA: Some info USA: Another info
456	Minnie	1992	USA
789	Donald	1994	USA
567	Humpty	2016	USA

Recap: Relational Model (4)

How are these data actually stored?

id	name	year	country
123	Mickey	1992	USA
456	Minnie	1992	USA
789	Donald	1994	USA
567	Humpty	2016	USA