



SNS COLLEGE OF TECHNOLOGY

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Department of MCA

DBMS Introduction

Course Name : 19CAT609 - DATA BASE MANAGEMENT SYSTEM

Class : I Year / II Semester

Unit II – Relational Model





Relational Model



- **History of Relational Model**
- **Terminologies**



History of Relational model



- The relational Model was proposed by E.F. Codd to model (in 1970)
- Uses concept of mathematical relation
- First commercial implementations of the relational model oracle DBMS, (SQL/DS) Sytem (IBM)

- Some popular Relational Database management systems are:
 - DB2 and Informix Dynamic Server – IBM
 - Oracle and RDB – Oracle
 - SQL Server and Access – Microsoft

- Standard for commercial RDBMS ---> SQL Query Language

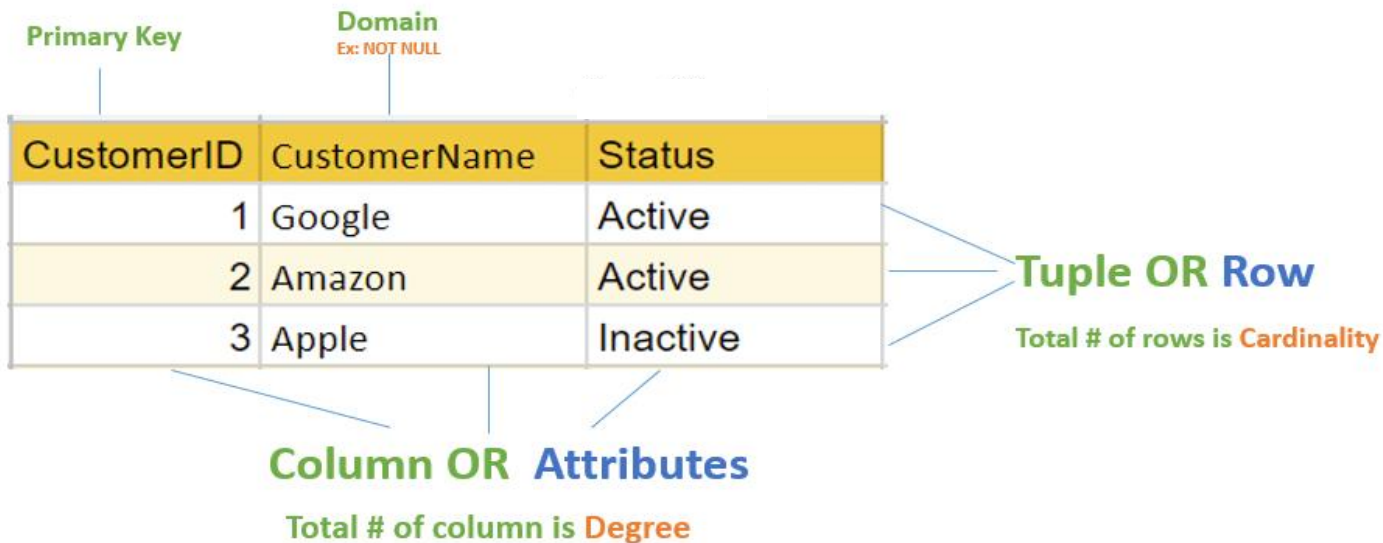


Relational Model



- Relational model can represent as a table with columns and rows. Each row is known as a tuple. Each table of the column has a name or attribute.

Table also called Relation

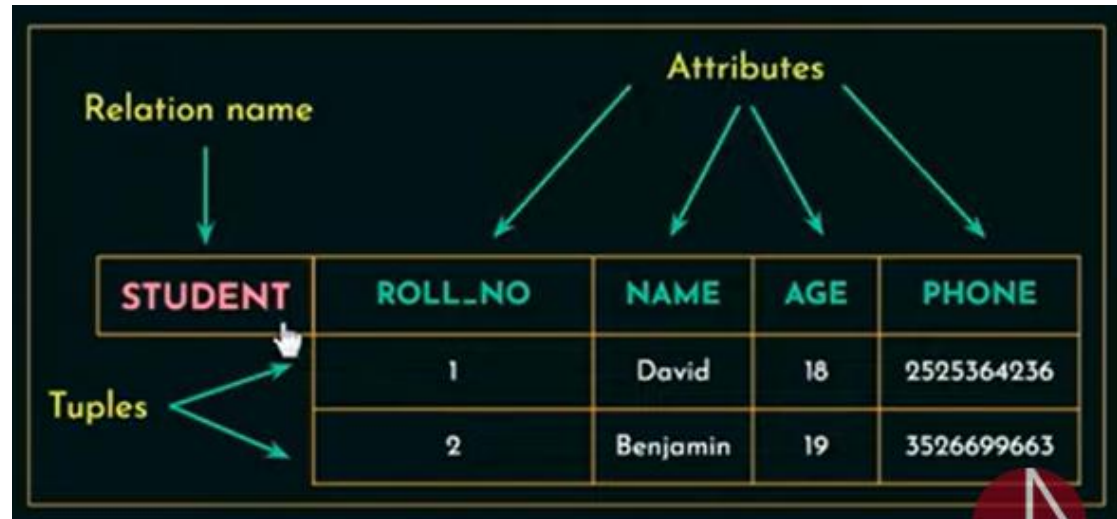




Relational Model



- Relational Model represents data as a collection of tables.
- A table is also called a relation.
- Each Row ---> Tuple
- Column Headers ---> Attributes





Relational Model



- **Domain**
- A set of atomic values allowed for an attribute.
- **Ex 1. Name** : String of characters that represent name of person
- **Ex 2. Employess_ages** : Possible ages of employees of a company
(Values between 20 and 70 years old)

Domain Constraints

Roll.no	Name	Age	→ Domain
1	Arya	21	Age must be greater than 18 and must be an integer
2	Bran	19	
3	John	24	
4	Max	24	



Relational Model

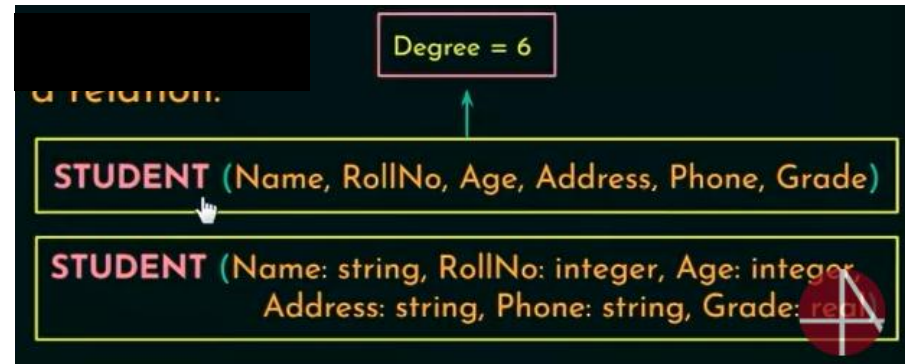


❖ Relation Schema:

- Describes a relation
- Made up of a relation name R and a list of attributes A1, A2, A3, An.

❖ Degree (or arity) of a relation:

- Number of attributes in a relation shema





Relational Model



❖ Cardinality:

- Total number of tuples present in a relation.

❖ Relational Database Schema:

- Is a set of relation schemas and a set of integrity constraints.

❖ Relation state or (Relation Instance)

- Set of Tuples at a given time.

STUDENT	ROLL_NO	NAME	AGE
	1	Harry	19
	2	Ben	22
	3	Kathy	20

Cardinality = 3



Relational Model



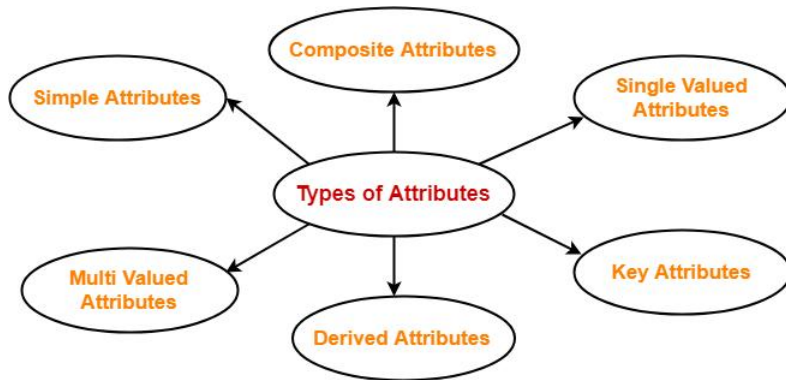
1. Attribute
2. Tables
3. Tuple
4. Relation Schema
5. Degree
6. Cardinality
7. Column
8. Relation instance
9. Relation key
10. Attribute domain



Relational Model



Attribute: It contains the name of a column in a particular table. Each attribute A_i must have a domain, $dom(A_i)$



Attributes

Schema

StudentID	Name	Phone	DOB
111335555	Matt	555-4141	06/03/70
111224444	Troy	556-9123	01/02/76
999775555	Sean	876-5150	10/31/81
444668888	Christy	219-7734	02/14/84

Tuple



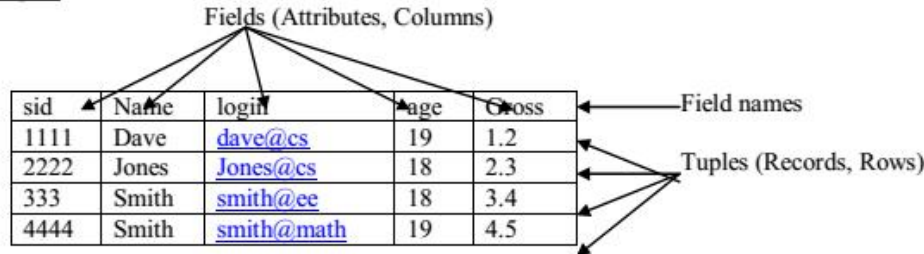
Relational Model



Relational instance: In the relational database system, the relational instance is represented by a finite set of tuples. Relation instances do not have duplicate tuples.

Example Instance of Students Relation

Example:



sid	name	login	age	gpa
53666	Jones	jones@cs	18	3.4
53688	Smith	smith@eecs	18	3.2
53650	Smith	smith@math	19	3.8

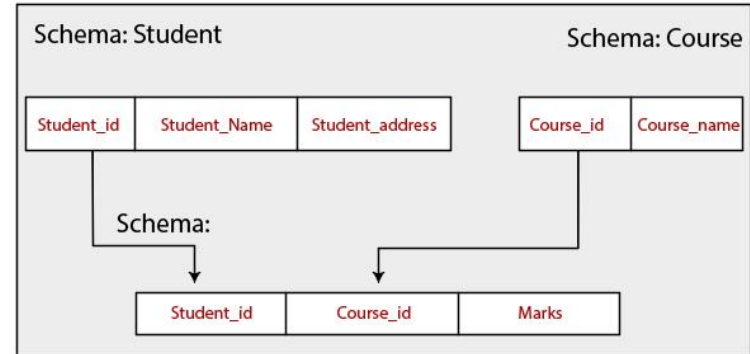
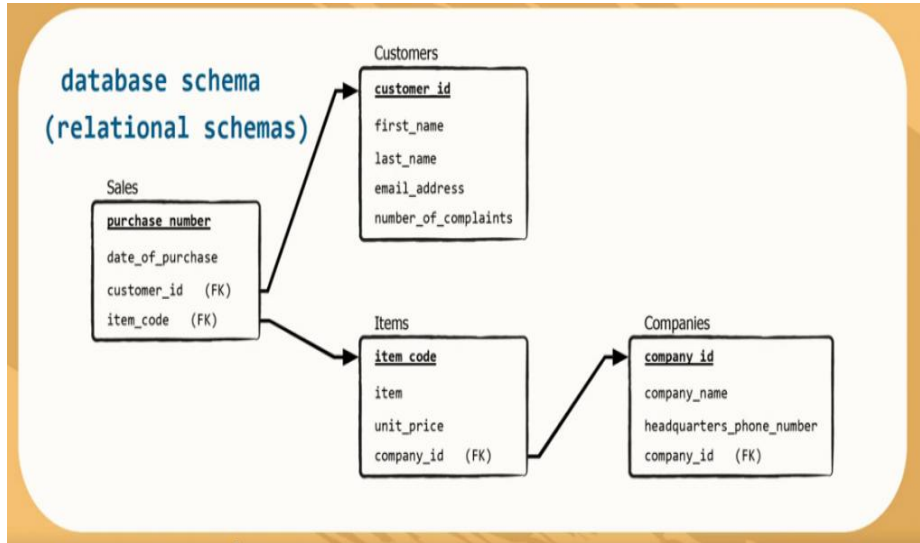
- Cardinality = 3, arity = 5 , all rows distinct
- Do all values in each column of a relation instance have to be distinct?



Relational Model



Relational schema: A relational schema contains the name of the relation and name of all columns or attributes.

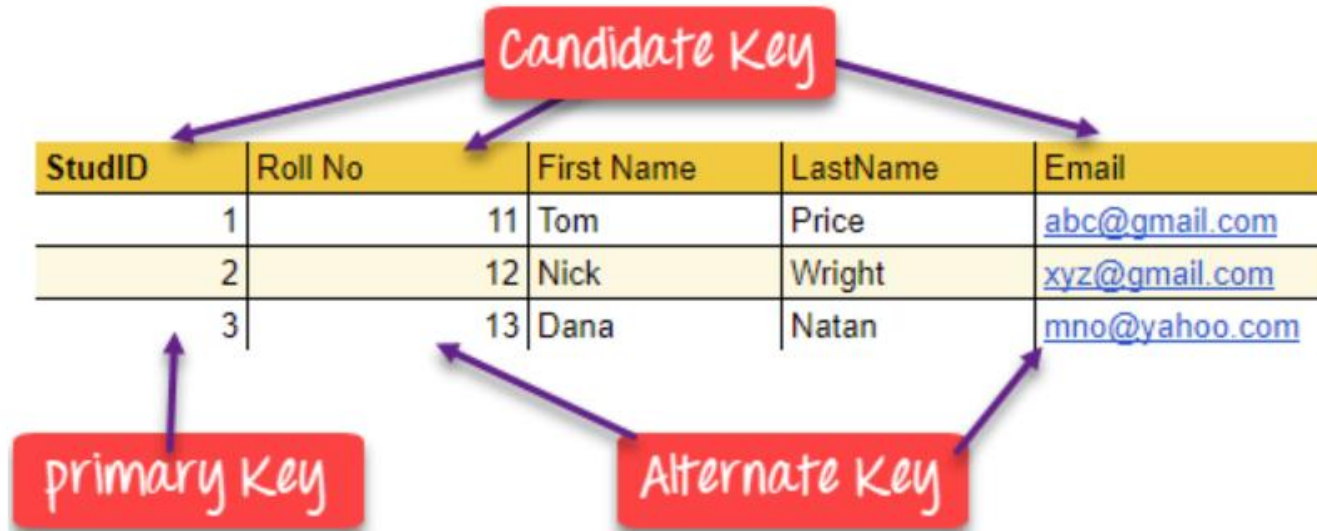




Relational Model



Relational key: In the relational key, each row has one or more attributes. It can identify the row in the relation uniquely.





Relational Model



- ❖ **Attribute:** Each column in a Table. Attributes are the properties which define a relation. e.g., Student_Rollno, NAME, etc.
- ❖ **Tables** – In the Relational model the, relations are saved in the table format. It is stored along with its entities. A table has two properties rows and columns. Rows represent records and columns represent attributes.
- ❖ **Tuple** – It is nothing but a single row of a table, which contains a single record.
- ❖ **Relation Schema:** A relation schema represents the name of the relation with its attributes.
- ❖ **Degree:** The total number of attributes which in the relation is called the degree of the relation.
- ❖ **Cardinality:** Total number of rows present in the Table.
- ❖ **Column:** The column represents the set of values for a specific attribute.
- ❖ **Relation instance** – Relation instance is a finite set of tuples in the RDBMS system. Relation instances never have duplicate tuples.
- ❖ **Relation key** – Every row has one, two or multiple attributes, which is called relation key.
- ❖ **Attribute domain** – Every attribute has some pre-defined value and scope which is known as attribute domain



References



<https://www.javatpoint.com/dbms-relational-model-concept>

<https://www.geeksforgeeks.org/relational-model-in-dbms/>

<https://www.javatpoint.com/dbms-relational-model-concept>

https://www.tutorialspoint.com/dbms/relational_data_model.htm