








COMPONENT OF RELATIONAL DATABASE STRUCTURAL TERMINOLOGY

01	RELATION (table) 	A relation is a table with column and rows
02	RECORD (tuple) 	A tuple is a row of a relation and sequence of attributes i.e. <i>a row in the relation table.</i>
03	CARDINALITY 	The cardinality of a relation is the number of tuples it contains/in relation
04	ATTRIBUTE (field) 	An attribute is a named column in the relation table.
05	DEGREE 	The degree of a relation refers to the number of attributes in each tuple
06	PRIMARY KEY (PK) 	Primary Key (PK) is an attribute (or a combination of attributes) that uniquely identifies any given entity (row)
07	DOMAIN 	A domain is the set of allowable values for one or more attributes

Each attribute in the model should be assigned domain information which includes:



01

Data Type - Basic data types are integer, decimal, or character. Most data bases support variants of these plus special data types for date and time.

02

Length - This is the number of digits or characters in the value. For example, a value of 5 digits or 40 characters.

03

Date Format - The format for date values such as **dd/mm/yy** or **mm/dd/yyyy** or **yy/mm/dd**.

04

Range - The range specifies the lower and upper boundaries of the values the attribute may legally have.

05

Constraints - Are special restrictions on allowable values. For example, the **LeavingDate** for an Employee must always be greater than the **HireDate** for that Employee.

06

Null support - Indicates whether the attribute can have null values.

07

Default value (if any) - The value an attribute instance will have if a value is not entered.



DOMAIN relational database

- a) A domain is the set of allowable values for one or more attributes.
- b) It is Pool of value of specific attribute of relation.
- c) A domain is a named set of scalar values, all of the same type.

Example **DOMAIN** :

- Example 1: Domain of P# is the set of character strings of length 6.
- Example 2: Domain of WEIGHT is the set of small integers less than 10,000.
- Example 3: Domain of QTY is the set of integers less than one billion.
- Example 4: Domain of GENDER is the set of character string MALE or FEMALE.



Example Attribute DOMAIN

Attribute	Domain Name	Meaning	Domain Definition
branchNo	BranchNumbers	The set of all possible branch numbers	character: size 4, range B001–B999
street	StreetNames	The set of all street names in Britain	character: size 25
city	CityNames	The set of all city names in Britain	character: size 15
postcode	Postcodes	The set of all postcodes in Britain	character: size 8
sex	Sex	The sex of a person	character: size 1, value M or F
DOB	DatesOfBirth	Possible values of staff birth dates	date, range from 1-Jan-20, format dd-mmm-yy
salary	Salaries	Possible values of staff salaries	monetary: 7 digits, range 6000.00–40000.00

Table: EMPLOYEES

columns

The diagram illustrates the structure of the EMPLOYEES table. A bracket on the left labeled 'rows' points to the six data rows. A bracket at the top labeled 'columns' points to the six header columns. Below the table, three labels with arrows identify specific columns: 'Primary Key Column (PK)' points to EMPLOYEE_ID, 'Foreign Key Column (FK)' points to DEPARTMENT_ID, and 'Unique Key Column (UK)' points to PAYROLL_ID.

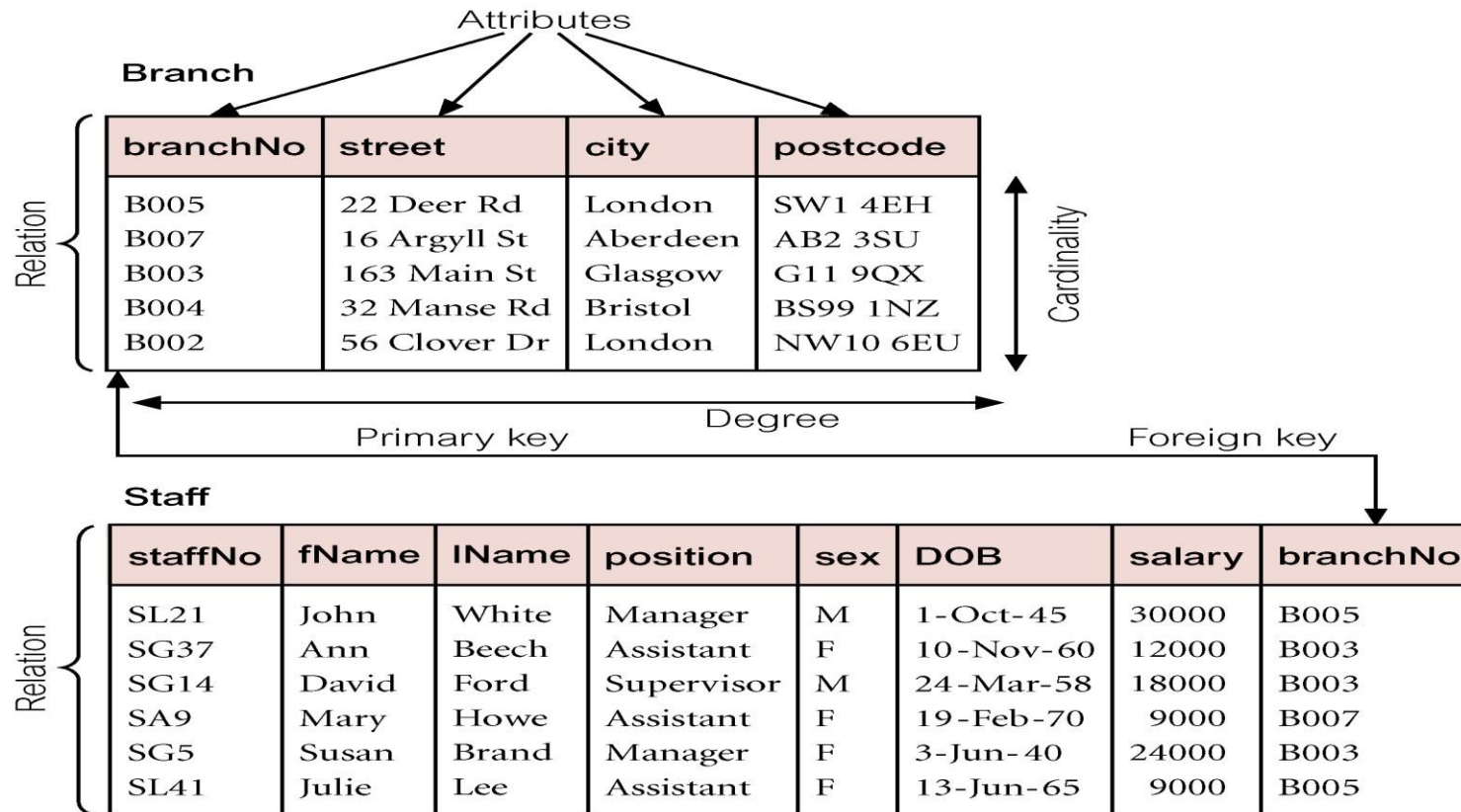
EMPLOYEE_ID	LAST_NAME	FIRST_NAME	DEPARTMENT_ID	PAYROLL_ID	NICKNAME
100	SMITH	DANA	10	21215	Dana
310	ADAMS	TYLER	15	59877	Ty
210	CHEN	LAWRENCE	10	1101	Larry
405	GOMEZ	CARLOS	10	52	Chaz
378	LOUNGANI	NEIL	22	90386	Neil

Primary Key Column (PK)

Foreign Key Column (FK)

Unique Key Column (UK)

Relational Database Model Terminology



Relational Database

Example 1

Diagram illustrating a Relational Database table structure and data:

CustomerID	FirstName	LastName	Birthdate
XY001	John	Doe	April 18, 1929
BR092	Mary	Green	March 4, 1980
PD500	Francesca	de la Gillebert	September 12, 1959
WI308	John	Green	March 4, 1980

Annotations:

- Table (relation):** The entire table structure.
- Column (attribute):** Individual columns (CustomerID, FirstName, LastName, Birthdate).
- Row (tuple):** Individual rows of data.
- Primary key:** The CustomerID column.
- Data value:** Individual data entries within the cells.

Relational Database

Example 2

Alternative Terminology Relational Model

Formal terms	Alternative 1	Alternative 2
Relation	Table	File
Tuple	Row	Record
Attribute	Column	Field

PROPERTIES OF RELATIONAL DATABASE

A relational database has **SIX TABLE PROPERTIES**:

1. Values are atomic
2. Each row is unique
3. All of the values in a column have the same data type
Column values are of the same kind
4. Each column has a unique name
5. The sequence/order of columns is insignificant.
6. The sequence/order of rows is insignificant.