Database Design Key Terms

Data:

Data is defined as facts or figures. The word data comes from the Latin word “datum” which means “something given”. The word datum is technically correct singular form of data but is not used normally. Instead “data” can be used for a singular fact or a collection of facts.

Information:

If data is the atom, information is the matter. Information is the set of data that has already been processed, analyzed, and structured in a meaningful way to become useful. Once data is processed and gains relevance, it becomes information that is fully reliable, certain, and useful.

Difference between Data and Information:

- Data is a collection of facts. Information is how you understand those facts in context.
- Data is unorganized, while information is structured or organized.
- Information is an uncountable noun, while data is a mass noun.
- The word information is used with a singular verb, while data is used with a plural verb.
- Data is not typically useful on its own, but information is.
- Data generally includes the raw forms of numbers, statements, and characters. Information doesn’t have to.
- Information depends on data.

Types of DBMS:

1) Relational DBMS
2) Network DBMS
3) Hierarchical DBMS
4) Object-Oriented DBMS

RDBMS:

This model represents the database as a collection of relations in form of rows and columns.
Some popular Relational Database Management systems are-
DB2 and Informix Dynamic Server-IBM
Oracle and RDB- Oracle
SQL server and Access- Microsoft

Relation: Table is also known as relation.
Field/ Attribute: Attributes are the properties which define a relation. For exp: Emp_Id, NAME, Salary etc.
Tuple/ Row/ Record: Single row of a table.
Column/ Attribute: Set of values for specific vertical column.
Degree: Total number of attributes in the relation.
Cardinality: Total number of rows in the table.
Relational Integrity Constraints: Conditions which must be present for a valid relation. These constraints are divided into three main categories- Domain, Key and Referential integrity constraints.

Domain constraint: Enforces valid entries for a given column by restricting the type, the format, or the range of values. Exp. NOT NULL

Key Constraint: An attribute that can uniquely identify a tuple in a relation is called the key of the table. Exp, Primary Key

Referential integrity Constraint: Where relation refers to a key attribute of a different o same relation. Exp, Foreign key.

Normalization:

It is the process of organizing the data in the database. It is used to minimize the redundancy and anomalies from the database table. Simply, it divides the larger table into smaller table and links them using relationship.

Types of Normal forms:

There are four types-
1NF, 2NF, 3NF and BCNF

1NF:
A relation is in 1NF if it contains an atomic value. It means that an attribute of a table cannot hold multiple values.

2NF:
A relation will be in 2NF if it is in 1NF and all non-key attributes are fully functional dependent on the primary key.

3NF:
A relation will be in 3NF if it is in 2NF and no transition dependency exists.

4NF (BCNF):
A relation will be in 4NF if it is in Boyce Codd normal form and has no multi-valued dependency.

5NF:
A relation is in 5NF if it is in 4NF and not contains any join dependency and joining should be lossless. It is also known as Project-join normal form.

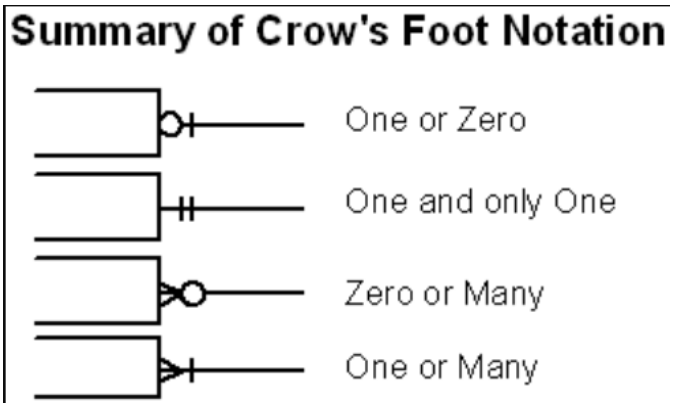
ERD (Entity Relationship diagram):

ERD or ER model is a structural diagram used in database design to show relationships between various entities.

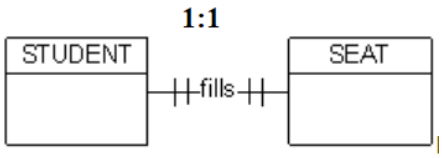
Cardinality:

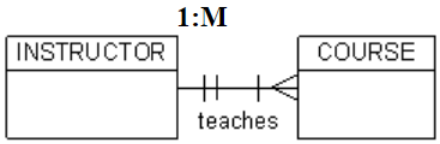
Cardinality defines the possible number of occurrences in one entity which is associated with the number of occurrences in another. For example, ONE team has MANY players. When present in an ERD, the entity Team and Player are inter-connected with a one-to-many relationship.

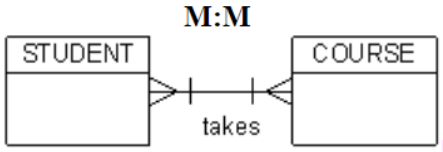
Crow’s foot notation:

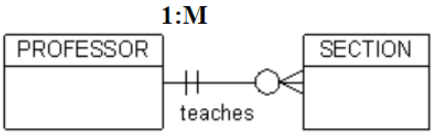


Relations :









SQL

For SQL syntax and commands, Visit **SQL (javatpoint.com)**