# View of data

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DB System : Collection of interrelated data and a set of programs that allow users to access and modify these data.

- major purpose of a database system is to provide users with an abstract view of the data.
  - Data models: A collection of conceptual tools for describing data, data relationships, data semantics, and consistency constraints.
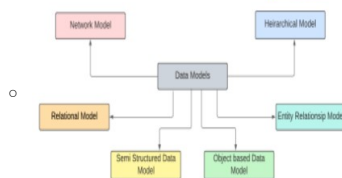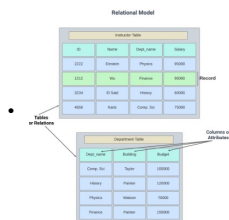

  - Data abstraction: Hide the complexity of data structures to represent data in the database from users through several levels of data abstraction.
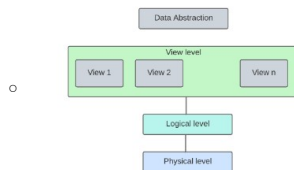
Structure of db is defined by : its data model (tools to describe data, relationships, semantics, and consistency constraints)

Data Models

Relational Model

- Uses a collection of tables to represent both data and the relationships among those data.
- Table= relations
- Each table has multiple columns, and each column has a unique name
- It is an example of a record based model
- Record-based models are so named because the database is structured in fixed-format records of several types.
- Each table contains records of a particular type. Each record type defines a fixed number of fields or attributes.
- Each row of the table represents one piece of information
- The columns of the table correspond to the attributes of the record type.
- Most widely used model

Entity- Relationship Model

- The entity-relationship (E-R) data model uses a collection of basic objects, called entities, and relationships among these objects.
- An entity is a "thing" or "object" in the real world that is distinguishable from other objects.
- Widely used in db design

Semi Structured Data Model

Example of XML data

- Permits the specification of data where individual data items of the same type may have different sets of attributes (in other data models, every data item must have same set of attributes)
- JSON and Extensible Markup Language (XML) are widely used semi-structured data representations
- No separation between data and schema (amount of structure depends on user purpose)
- It can represent the information of some data sources that cannot be constrained by schema.

Object based data model

- Rise of OOPS led to creation of this data model but most dbms use OOPS
- Standards exist to store objects in relational tables. Database systems allow procedures to be stored in the database system and executed by the database system.
- Extending the relational model with notions of encapsulation, methods, and object identity