RGPV 2019

Q. What do you mean by data modelling ? Compare different data models ?

Ans. Data modeling is a way to create data model for the data to be stored in a database. A data model a collection of conceptual tools for describing data, data relationships, data semantics, and consistency constraints. A data model provides a way to describe the design of a database at the physical, logical, and view levels.

Feature	Conceptual	Logical	Physical
Entity names	✔	✔	✔
Entity relationships	✔	✔	✔
Primary keys		✔	✔
Foreign keys		✔	✔
Column names			✔
Column data types			✔

The data models can be classified as:

1. Relational Model
2. Entity-Relationship Model.
3. Object-Based Data Model
4. Semi-structured Data Model
5. Network Data Model
6. Hierarchical Data Model

1. Relational model:

- The relational model uses a group of tables to represent both data and the relationships amongst those records.
- Each table has more than one column, and each column has a unique name. Tables are also referred as relations.

- Each table contains records of a specific type. Each record type defines a fixed number of fields, or attributes.
- The columns of the table correspond to the attributes of the record type.
- The relational data model is the most widely used data model.

2. 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.

3. Object-Based Data Model:

- Object-oriented programs (especially in Java, C ++, or C #) have become the preferred method of software development.
- This has led to the development of an object-focused data model that can be seen as an extension of the ER model with input ideas, methods (functions), and object.
- An object-related data model incorporates features of an object-focused data model and a data-related data model.

4. Semi-structured Data Model:

- The semi-structured data model permits the specification of data in which individual data items of the same type may have different sets of attributes.
- This is in contrast to the data models mentioned earlier, in which every data item of specific type must have the identical set of attributes.
- Extensible Markup Language (XML) is extensively used to represent semi-structured data.

5. Network Data Model:

- A network data model is a data model that allows multiple records to be linked to the same owner.
- The model can be seen as an upside down tree wherein the branches are the member information connected to the owner, that is the lowest of the tree.
- The multiple linkages which this information permits the network data model to be very flexible.
- Further, the relationship that the information has within the network data model is defined as many-to-many relationship because one owner file may be linked to many member documents and vice versa.

6. Hierarchical Data Model:

- Hierarchical Data Model involves parent/child relationship.
- In Hierarchical Data Model, parent can have more than one child.
- In Hierarchical Data Model, child can have only parent.
- Hierarchical data model visualize as upside/down tree.

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