1.What is Data Model

* Data model is a collection of concepts to describe the structure of a data base
* Data model address the structure of organizing data
* Data model defines how much logical structure of data base is moduled ,processed and stored

Types of Data Model

1. Hierarchical Data Model
2. Network data model
3. Relational data model
4. Object oriented Data Model
5. Entity -Relationship Data Model
6. Hierarchical Data Model

It is a data model in which the data is organized into tree structure .

* The structure represents information using parent and child relationship
* Each parent can have many different childrends but each child have only one parent
* It support data sharing,data impendence and it provides security
* Difficult to manage and structure dependent

manager

Assistant manager-2

Assistant manager-1

Team lead

Employess

B.Network data model

In network model parents can have serval childerns and childrens can have many parents

* A set represents one to to many relationship between parent and child
* It supports data base integrity
* Ddl,dml commands

Complex implementation

manager

Assistant manager-2

Assistant manager-1

Clerk1

Clerk2

C.Relational Data Model

In the Relational Model the data is maintained in the form of Tables

* Table contains rows and columns
* Data in 2 tables is related throught common columns and not throught pointers
* Structured independence
* Easier data base design,implementation and management and use
* It requires large data base management software oriented

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| Item cost |  | NEEDED |
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| Magazines 150 |  | 3 |
| Notebooks 25 |  | 1 |
| Paper pads 40 |  | 1 |
| Pens 5 |  | 3 |
| Pencils 9 |  | 2 |
| Highlighter 10 |  | 2 colors |
| Scissors 12 |  | 1 pair |

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| ITEM | persons |
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| Magazines | 15 |
| Notebooks | 17 |
| Paper pads | 1 |
| Pens | 3 |
| Pencils | 2 |
| Highlighter | 20 |
| Scissors | 19 |

d.Object oriented data model

An object oriented Data Model is a data modling approach that represents data as object ,similar to OOPS ..every object have Properties,relationship,and behaviours and orders or product

This model is a combination of an object-oriented database model and a relational database model. Therefore, it blends the advanced functionalities of the object-oriented model with the ease of the relational data model.

The data modeling process helps organizations to become more data-driven. This starts with cleaning and modeling data. Let us look at how data modeling occurs at different levels.

Entity Relationship Model

E-R Model is a visual representation of data that describes how data is related to each other

* It is a graphical representation of Entities,Attributes and Relationships
* It Represents Entities relationship diagram

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Data Modeling Process

Data modeling is a process of creating a conceptual representation of data objects and their relationships to one another. The process of data modeling typically involves several steps, including requirements gathering, conceptual design, logical design, physical design, and implementation. During each step of the process, data modelers work with stakeholders to understand the data requirements, define the entities and attributes, establish the relationships between the data objects, and create a model that accurately represents the data in a way that can be used by application developers, database administrators, and other stakeholders.

Levels Of Data Abstraction

Data modeling typically involves several levels of abstraction, including:

* Conceptual level: The conceptual level involves defining the high-level entities and relationships in the data model, often using diagrams or other visual representations.
* Logical level: The logical level involves defining the relationships and constraints between the data objects in more detail, often using data modeling languages such as SQL or ER diagrams.
* Physical level: The physical level involves defining the specific details of how the data will be stored, including data types, indexes, and other technical details.