Types of Databases and Database Applications   
• Traditional Applications:   
 Numeric and Textual Databases   
• More Recent Applications:   
 Multimedia Databases   
 Geographic Information Systems (GIS)   
 Data Warehouses   
 Real-time and Active Databases   
 Many other applications   
 Data Model   
A model is an abstraction process that hides superfluous details. Data modeling is   
used for representing entities of interest and their relationship in the database.   
Data model and different types of Data Model   
Data model is a collection of concepts that can be used to describe the structure of a   
database which provides the necessary means to achieve the abstraction. The structure of   
a database means that holds the data.   
/barb2right data types

/barb2right relationships   
/barb2right constraints   
Types of Data Models   
1. High Level- Conceptual data model.   
2  
. Low Level – Physical data model.   
3. Relational or Representational   
4. Object-oriented Data Models:   
5. Object-Relational Models:   
   
1. High Level-conceptual data model: User level data model is the high level or   
conceptual model. This provides concepts that are close to the way that many   
users perceive data.   
2 .Low level-Physical data model : provides concepts that describe the details of how   
data is stored in the computer model. Low level data model is only for Computer   
specialists not for end-user.   
3. Representation data model: It is between High level & Low level data model   
 Which provides concepts that may be understood by end-user but that are not too   
far removed from the way data is organized by within the computer.   
The most common data models are   
1. Relational Model   
 The Relational Model uses a collection of tables both data and the relationship   
among those data. Each table have multiple column and each column has a unique   
name .   
Relational database comprising of two tables   
Customer –Table.

Customer-Name Security   
Number Address City Account-  
Number   
Preethi 111-222-3456 Yelhanka Bangalore A-101   
Sharan 111-222-3457 Hebbal Bangalore A-125   
Preethi 112-123-9878 Jaynagar Bangalore A-456   
Arun 123-987-9909 MG road Bangalore A-987   
Preethi 111-222-3456 Yelhanka Bangalore A-111   
Rocky 222-232-0987 Sanjay Nagar Bangalore A-111   
Account –Table   
Account-Number Balance   
A-101 1000.00   
A-125 1200.00   
A-456 5000.00   
A-987 1234.00   
A-111 3000.00   
Customer Preethi and Rocky share the same account number A-111   
Advantages   
1. The main advantage of this model is its ability to represent data in a simplified   
format.   
2. The process of manipulating record is simplified with the use of certain key   
attributes used to retrieve data.   
3. Representation of different types of relationship is possible with this model.   
2. Network Model   
The data in the network model are represented by coll e ction of records and   
relationships among data are represented by links, which can be viewed as pointers.   
Preethi 111-222-3456 yelhanka Bangalore   
   
   
   
   
   
 A-101 1000.00   
A-111 3000.00

The records in the database are organized as collection of arbitrary groups.   
Advantages:   
1. Representation of relationship between entities is implemented using pointers   
which allows the representation of arbitrary relationship   
2. Unlike the hierarchical model it is easy.   
3. data manipulation can be done easily with this model.   
   
3. Hierarchical Model   
A hierarchical data model is a data model which the d a ta is organized into a tree like   
structure. The structure allows repeating information using parent/child relationships:   
each parent can have many children but each child only has one parent. All attributes   
of a specific record are listed under an entity type.   
   
Advantages:   
1. The representation of records is done using an ordered tree, which is natural   
method of implementation of one–to-many relationships.   
2. Proper ordering of the tree results in easier and faster retrieval of records.   
3. Allows the use of virtual records. This result in a stable database especially when   
modification of the data base is made.

4 Object-oriented Data Models   
• Seve  
ral models have been proposed for implementing in a database system.   
• One set comprises models of persistent O-O Programming Languages such as   
C++ (e.g., in OBJECTSTORE or VERSANT), and Smalltalk (e.g., in   
GEMSTONE).   
• Additionally, systems like O2, ORION (at MCC – then ITASCA), IRIS (at H.P.-   
used in Open OODB).   
5 O bject-Relational Models   
• Most Recent Trend. Started with Informix   
• Universal Server.   
• Relational systems incorporate concepts from object databases leading to object-  
relational.   
• Object Database Standard: ODMG-93, ODMG-version 2.0,ODMG-version 3.0.   
• Exemplified in the latest versions of Oracle-10i,DB2, and SQL Server and other   
DBMSs.   
• Standards included in SQL-99 and expected to be enhanced in future SQL   
standards.