

- ## Limitations of File-based Approach
- **Separation and isolation of data**
 - **Duplication of data**
 - **Data dependence**
 - **Incompatible file formats**
 - **Fixed Queries/Proliferation of application programs**

Database Management Systems

What is DMBS?

- A database management system (DBMS) is software that enables the developer
 - to define a database by specifying its logical (and perhaps physical structure) and
 - to create, modify, delete and retrieve data held in the database, subject to automatic security and integrity checks performed by the DBMS.

Database Management System (DBMS)

Property: **Prop**(Property Number, Street, Area, City, Post Code, Property Type, Number of Rooms, Monthly Rent, Owner Number)

Owner: **Own**(Owner Number, First Name, Last Name, Address, Telephone Number)

Realtor: **Real**(Realtor Number, First Name, Last Name, Address, Telephone Number, Preferred Type, Marketing Base)

Lease: **Leas**(Lease Number, Property Number, Realtor Number, Payment Method, Deposit, Rent Start Date, Rent Finish Date)

Components of DBMS Environment

Roles in the Database Environment

- **Data Administrator (DA)**
- **Database Administrator (DBA)**
- **Database Designers (Logical and Physical)**
- **Application Programmers**
- **End Users (native and sophisticated)**

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Database Approach


- **Data definition language (DDL).**
- **Data manipulation language (DML).**
- **Controlled mechanism**
- **A view mechanism.**


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History of Database Systems

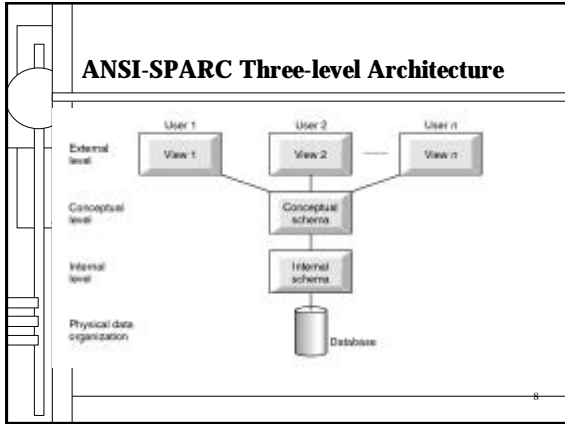
- **First-generation**
 - Hierarchical and Network
- **Second generation**
 - Relational
- **Third generation**
 - Extended Relational
 - Object-Oriented

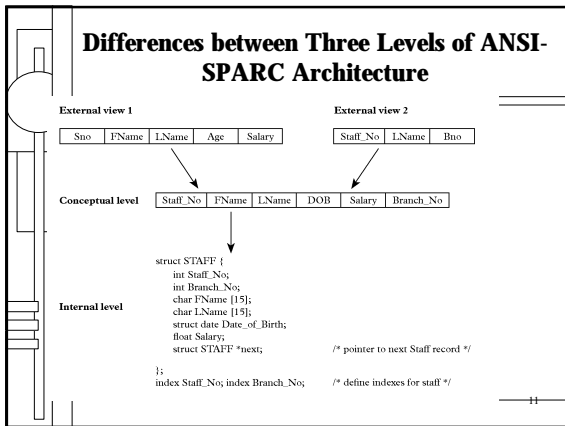
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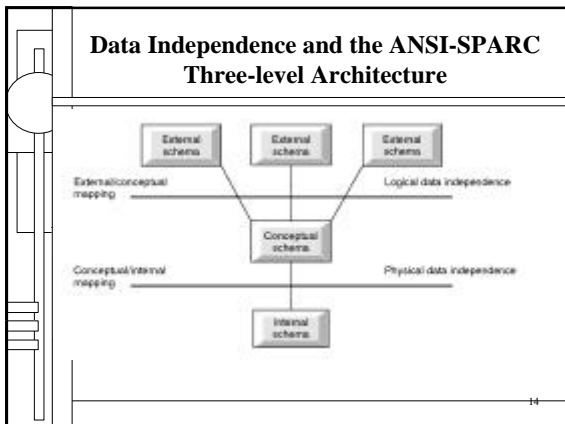
	Advantages of DBMS
	<ul style="list-style-type: none">• Control of data redundancy.• Data consistency• More information from the same amount of data.• Sharing of data.• Improved data integrity.• Improved security.• Enforcement of standards.• Economy of scale. <p style="text-align: right;">21</p>

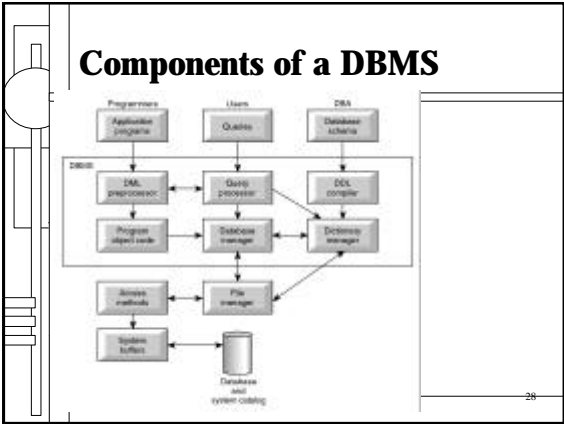
	Advantages of DBMS
	<ul style="list-style-type: none">• Balanced conflicting requirements• Improved data accessibility and responsiveness• Increased productivity• Improved maintenance through data independence• Increased concurrency• Improved backup and recovery services <p style="text-align: right;">22</p>

	Disadvantages of DBMS
	<ul style="list-style-type: none">• Complexity• Size• Cost of DBMS• Additional hardware costs• Cost of conversion• Performance• Higher impact of a failure <p style="text-align: right;">23</p>







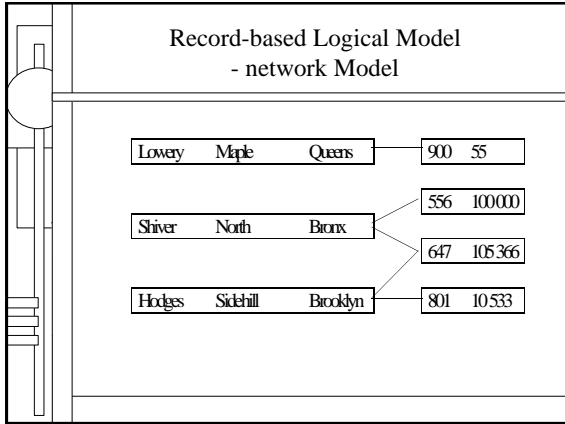


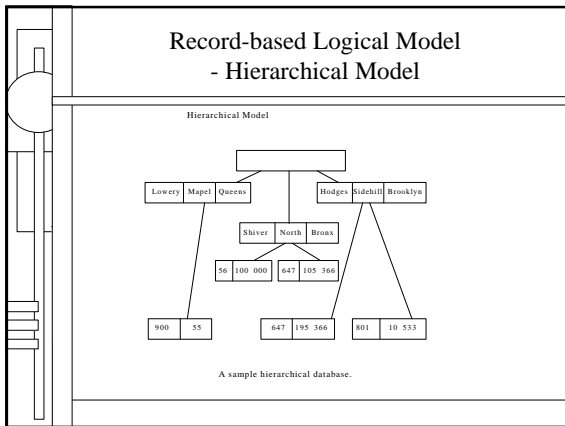
- ### Data Model
- **Object-based Data Models**
 - Entity-Relationship
 - Semantic
 - Functional
 - Object-Oriented
 - **Record-based Data Models**
 - Relational Data Model
 - Network Data Model
 - Hierarchical Data Model

Record-based Logical Model - Relational Model

<i>name</i>	<i>street</i>	<i>city</i>	<i>number</i>
Lowery	Maple	Queens	900
Shiver	North	Bronx	556
Shiver	North	Bronx	647
Hodges	Sidehill	Brooklyn	801
Hodges	Sidehill	Brooklyn	647

<i>number</i>	<i>balance</i>
900	55
556	100000
647	105366
801	10533





- ## Functions of a DBMS
- **Data Storage, Retrieval and Update.**
 - **A User-Accessible Catalog.**
 - **Transaction Support**
 - **Concurrency Control Services**
 - **Recovery Services**
 - **Authorization Services**
 - **Support for Data Communication**
 - **Integrity Services**
 - **Services to Promote Data Independence**
 - **Utility Services**
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