Introduction to Databases, Chapter 1
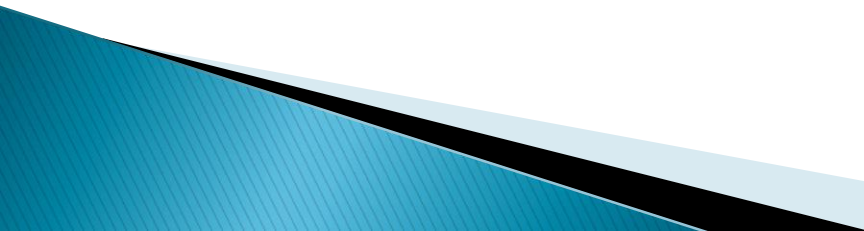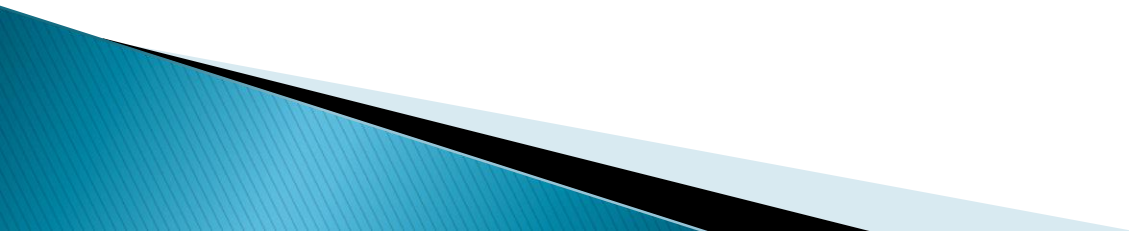
File-Based Approach

Limitations:
- Separation and isolation of data in different files
- Duplication of data in different files
- Program-data dependence
- Incompatible file formats between the data and the programming language used to process the data
- Fixed queries/proliferation of application programs
- No provision for security or integrity
- No provision for recovery
- Access to files was limited to one at a time

Database Approach

Database approach:

- Embed a definition of the data in the database so the application programs don't need to handle it (this is the system catalog also called the data dictionary and it holds meta data)
- Embed control over access and manipulation of the data in the database

Views
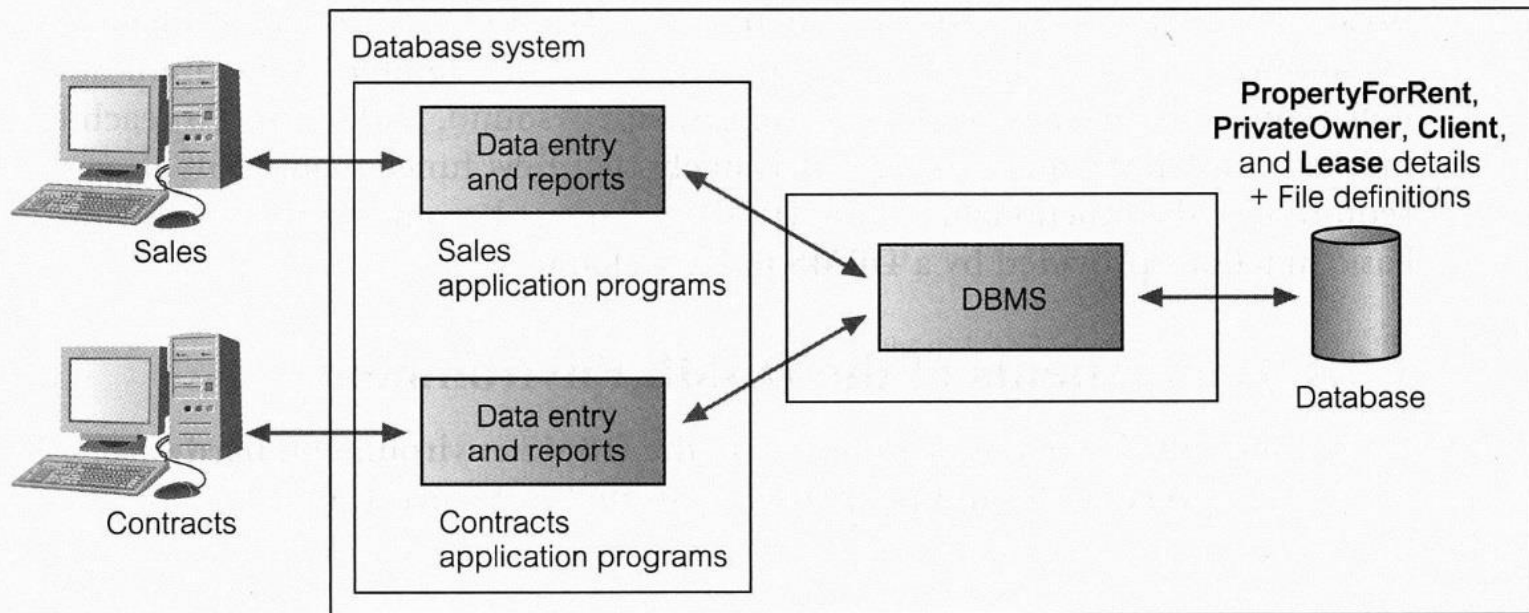
PropertyForRent (propertyNo, street, city, postcode, type, rooms, rent, ownerNo)
PrivateOwner (ownerNo, fName, lName, address, telNo)
Client (clientNo, fName, lName, address, telNo, prefType, maxRent)
Lease (leaseNo, propertyNo, clientNo, paymentMethod, deposit, paid, rentStart, rentFinish)

Figure 1.7 Database processing.

Modeling Data

Model the data in a database using a UML class diagram or an Entity-Relationship Diagram (ERD)

Entity-Relationship Diagram	UML Class Diagram	Meaning
Entity (also called relation or table)	Class	Distinct object or concept
Attribute	Data elements or attributes (No method elements)	Property of an entity
Relationship	Relationship	Association between two entities

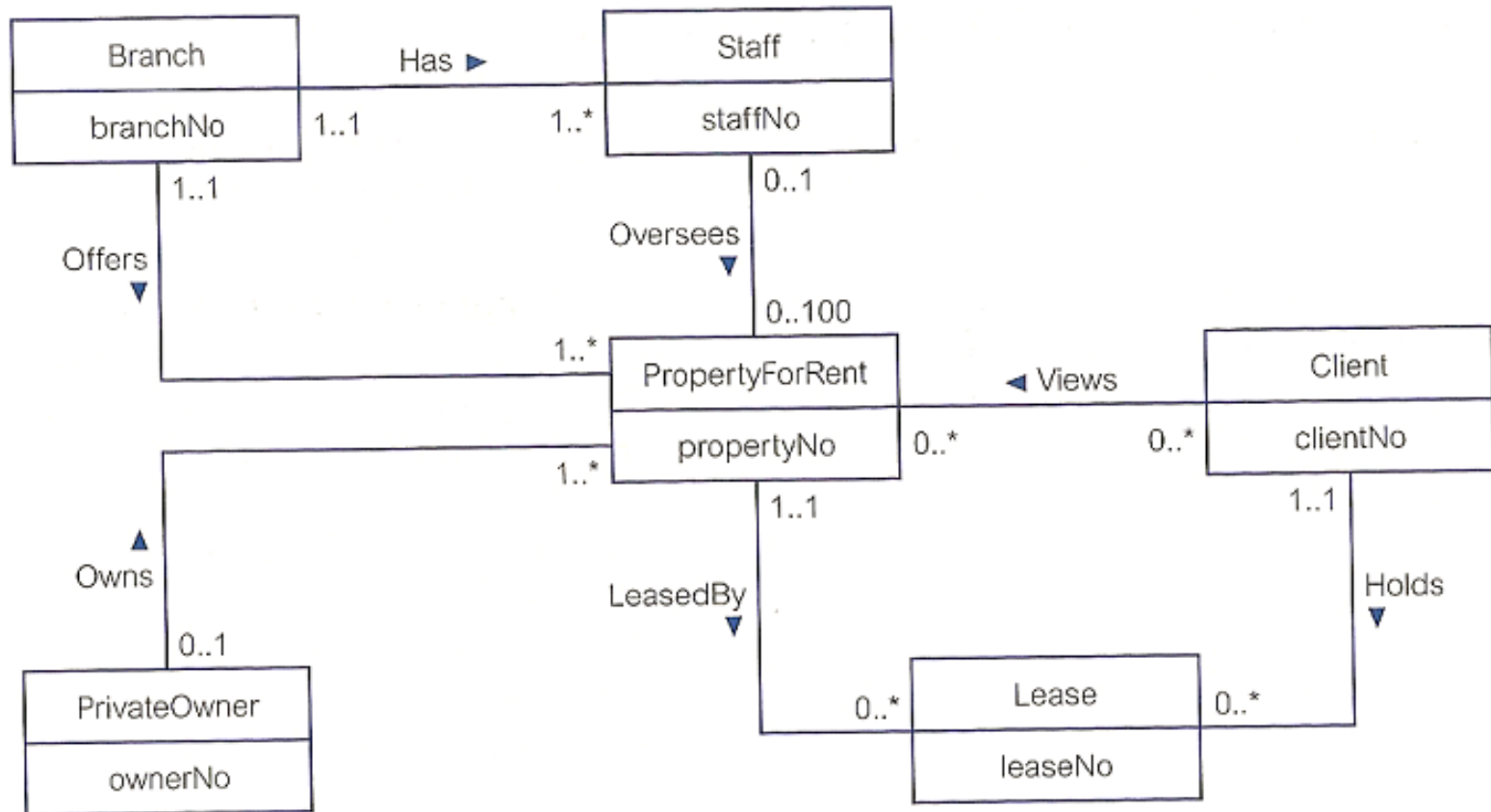# Example Entity–Relationship Diagram (UML)

Figure 1.6 Example Entity–Relationship diagram.

Example Entity–Relationship Diagram (UML)

Hotel Reservations Database

Hotel	
PK	**hotelNo**
	hotelName street city state zip

Booking	
PK **PK** **PK**	**hotelNo** **guestNo** **dateFrom**
	dateTo typeRequest

Guest	
PK	**guestNo**
	guestName guestAddress

Room	
PK **PK**	**roomNo** **hotelNo**
	type price