What is a Database

- A database describes a collection of data organized to allow storage, access, retrieval and the use of data.
- Contains at least one table
- Thought of like a manual file cabinet
- In large organizations it is the job of the DBA to administer the database.

What is Microsoft Access?

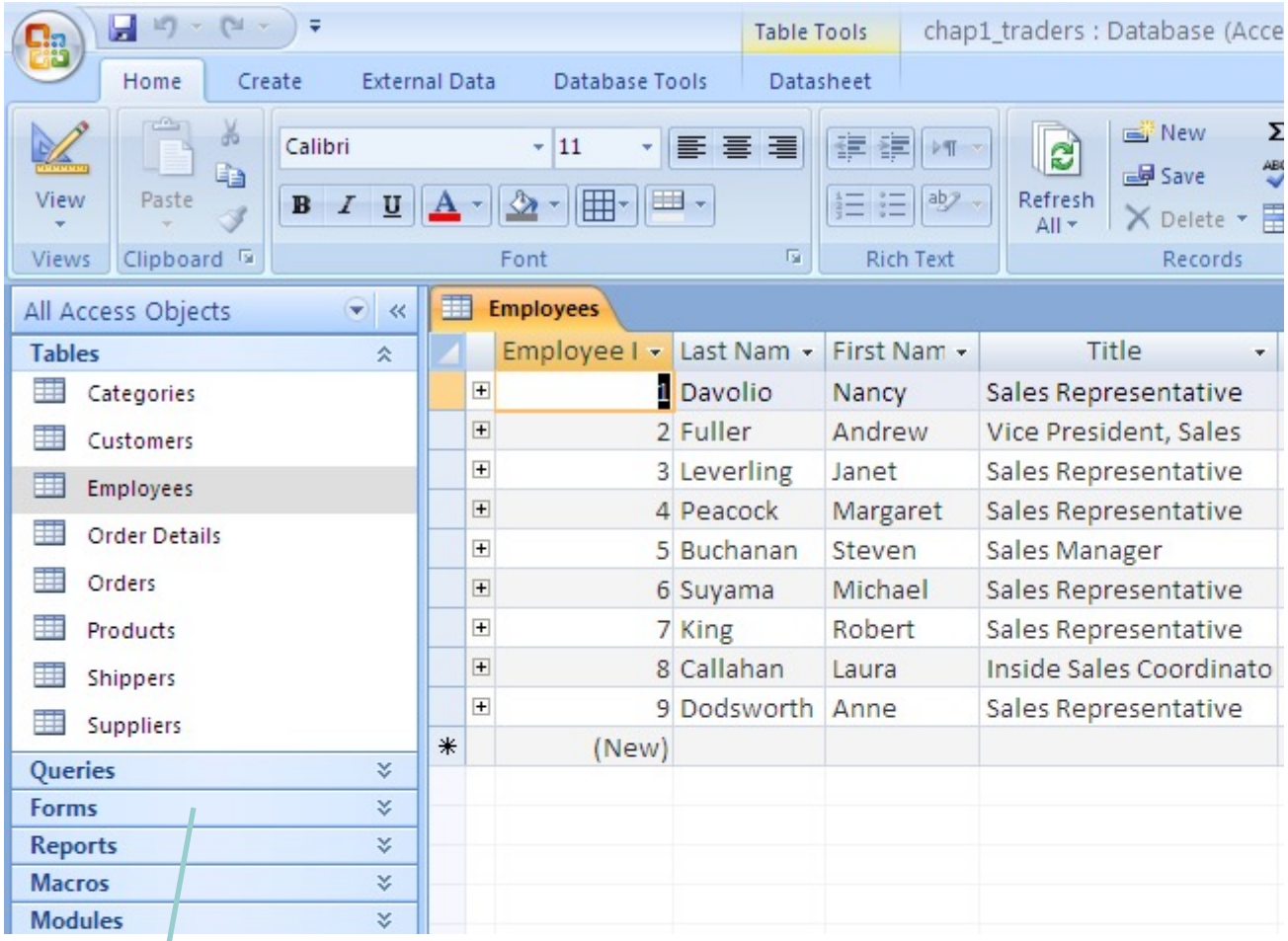
- A database management system.
- A DBMS is a software tool that allows you to use a computer to create databases, add, change, and delete data in a database.
- Other DBMS's include DB2, Oracle, SQL Server, Sybase

Why Access

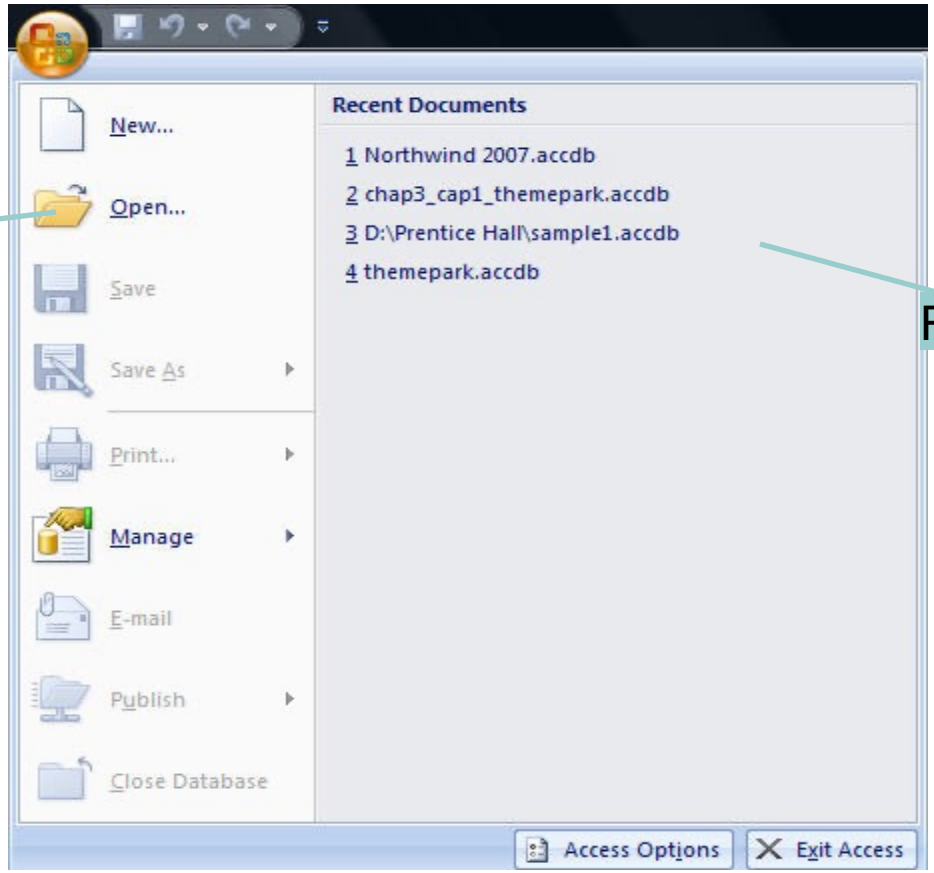
- Easy to learn
- Low cost
- Readily available
- Design principles we will learn can also be applied to enterprise level database management systems.

Objects in MS Access DB

- Tables
- Queries
- Reports
- Forms



Open a Database

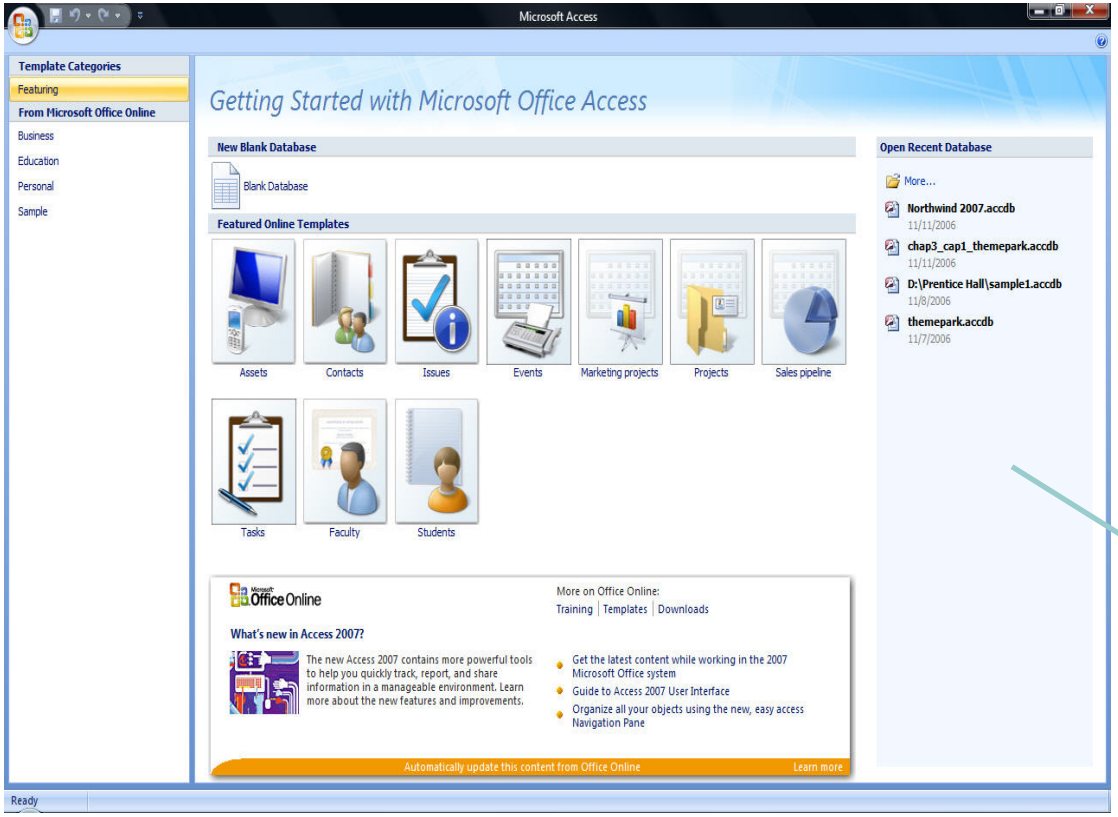


Open

Recent Documents list

- Choose Open to browse for a file or choose a database from the Recent Documents list

Open a Database

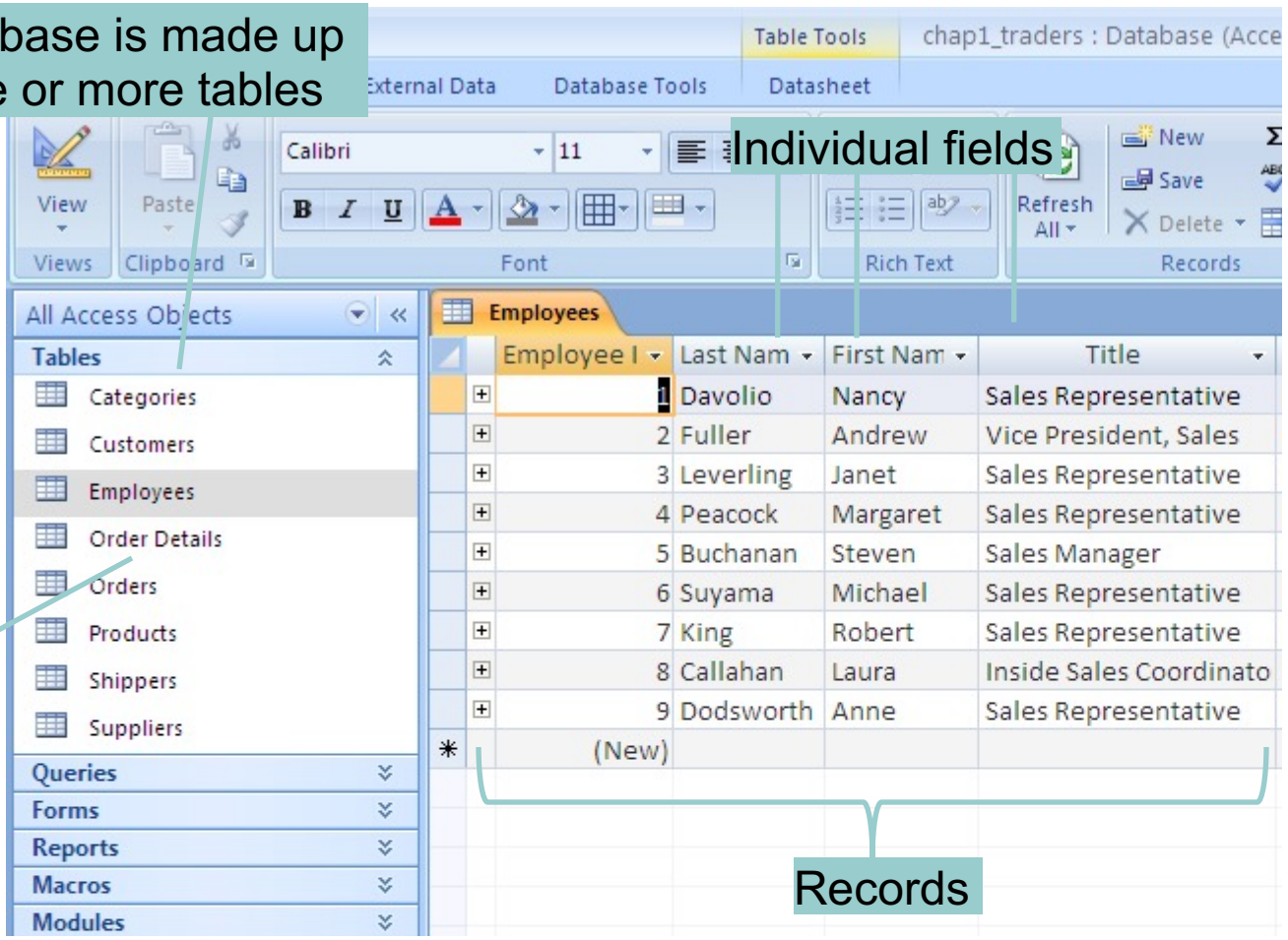


Open Recent Database list

- Choose a database from the Open Recent Database List or click More to browse for other databases

Database Terminology

- Field
- Record
- Table
- Database



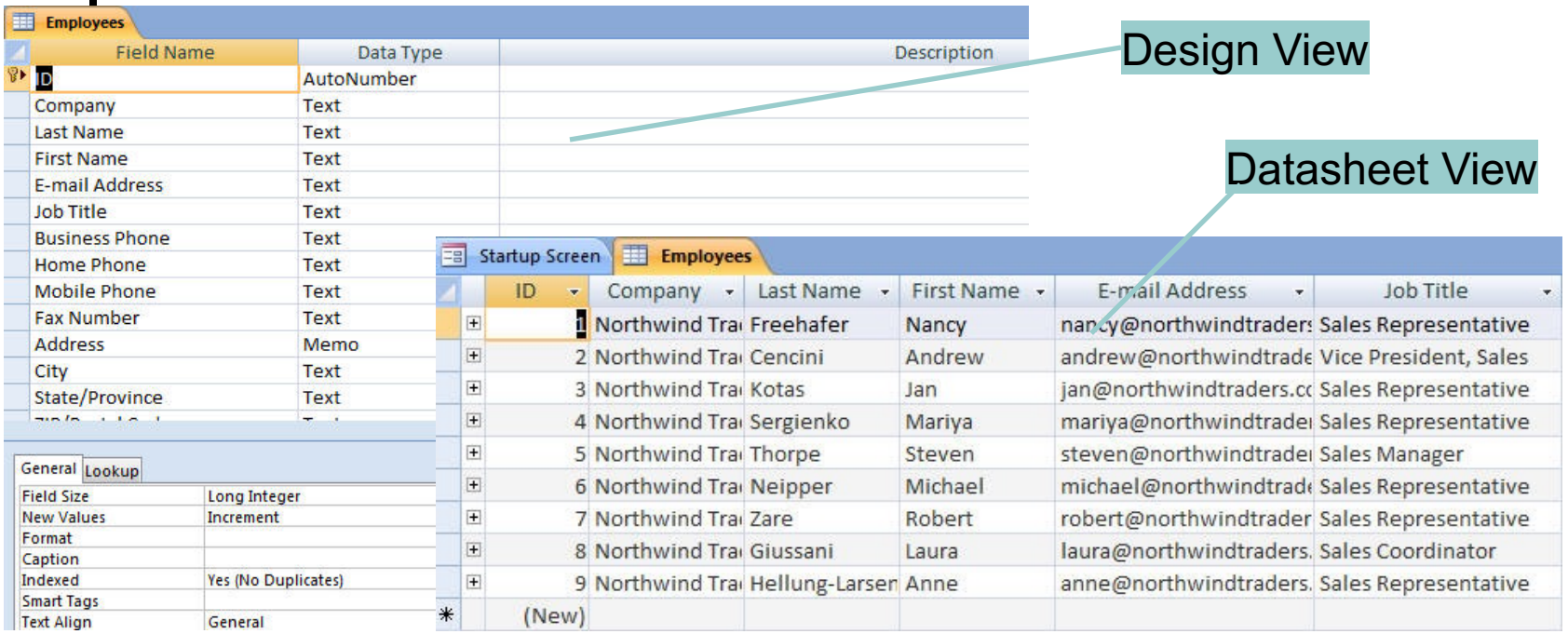
- A database consists of one or more tables. Each table consists of records which contain information about a single entity. An example of one complete record would be the name, author, isbn#, published date and publisher of textbooks. Each set of information regarding one book is considered to be one record. The name, author isbn#, published data and publisher in the above example are the individual fields that make up one record.

What is a Table

- A set of records.

- Different Views of tables:
  1. Design view used to create fields
  2. Datasheet view used to add, edit, or delete records
  3. Pivot table view used to summarize data about groups of records.
  4. PivotChart view creates a chart from the associated PivotTable view.

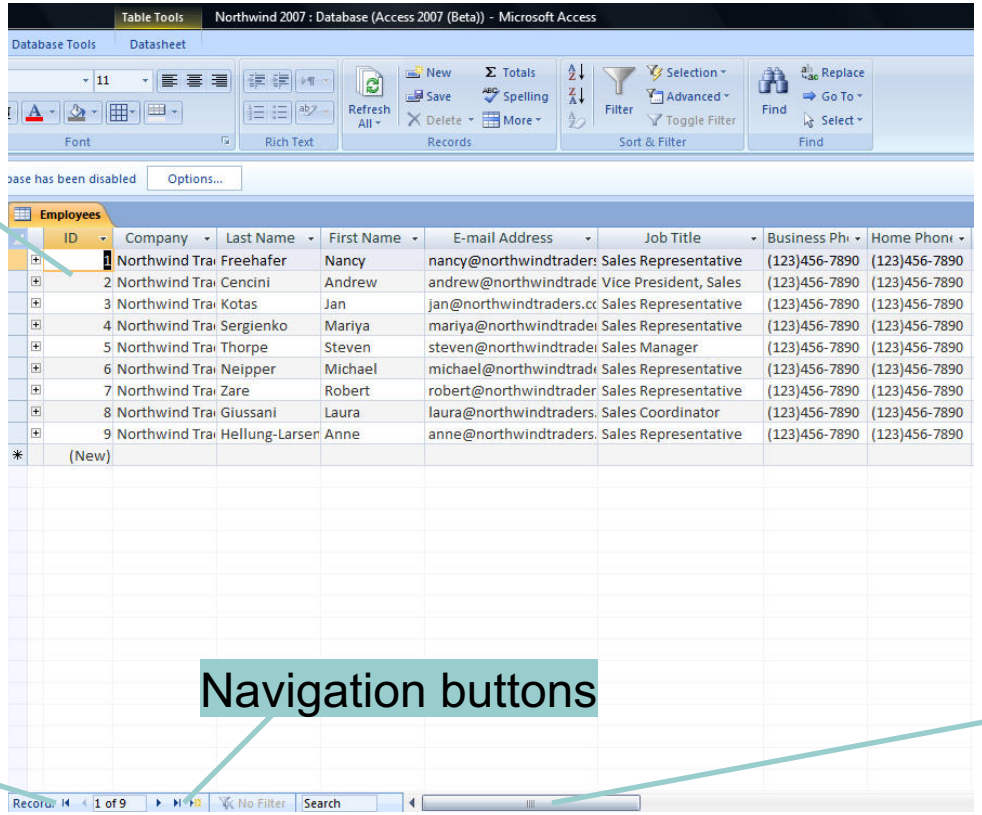
Work with Table Views



- Datasheet View – used to add, modify, delete and view records
- Design View – used to create and modify the fields in a table

Datasheet View

Primary key field



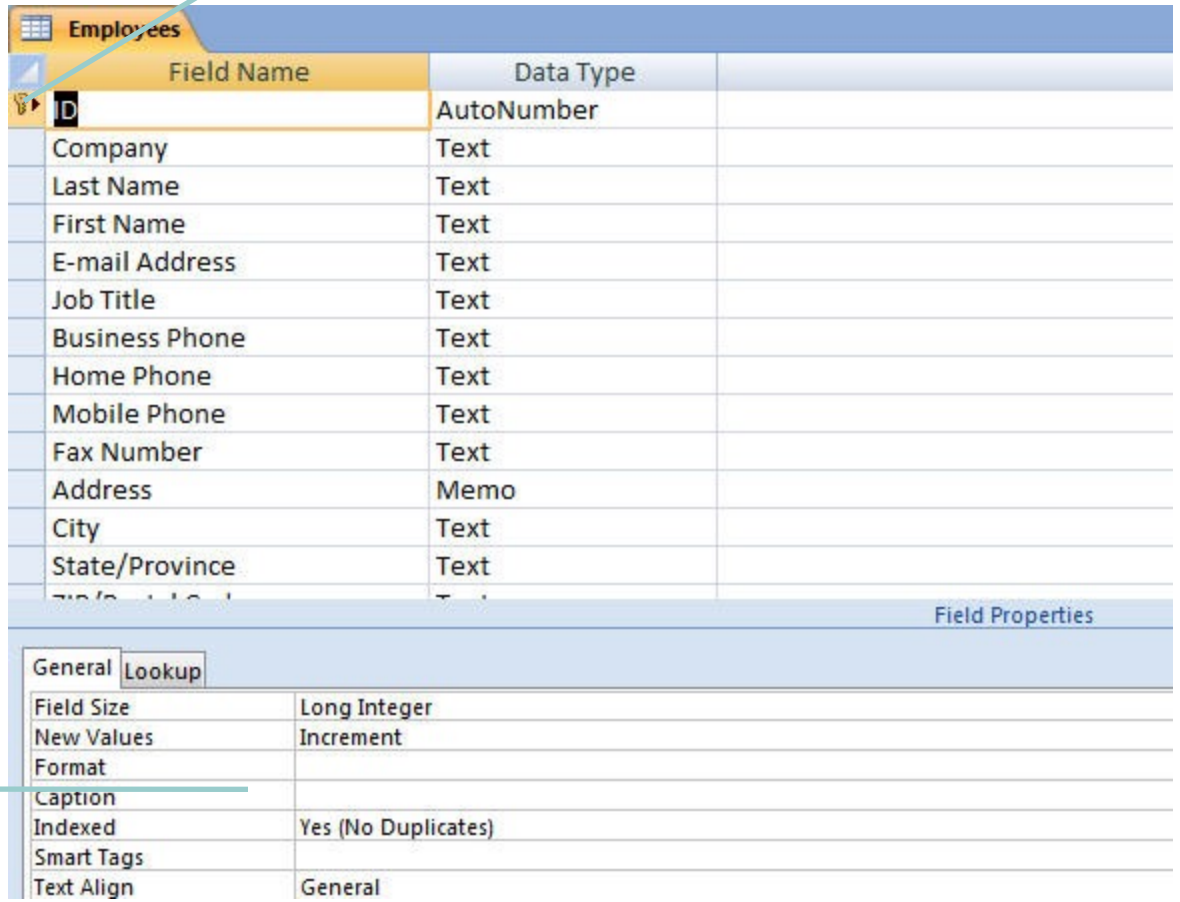
Navigation bar

Navigation buttons

Scroll bar

Design View

Key symbol identifies primary key field



Set field properties in the lower pane

Primary & Foreign Keys

- **Primary Key (PK)-** is the Field that Uniquely identifies each record in a table. It is needed for searching the database.
- Some times if there is no unique value in a table the database designer may use a auto number in Access to use a unique serialized number as the primary key.
- Examples: SIN, Student Number, heath card number.

Primary & Foreign Keys

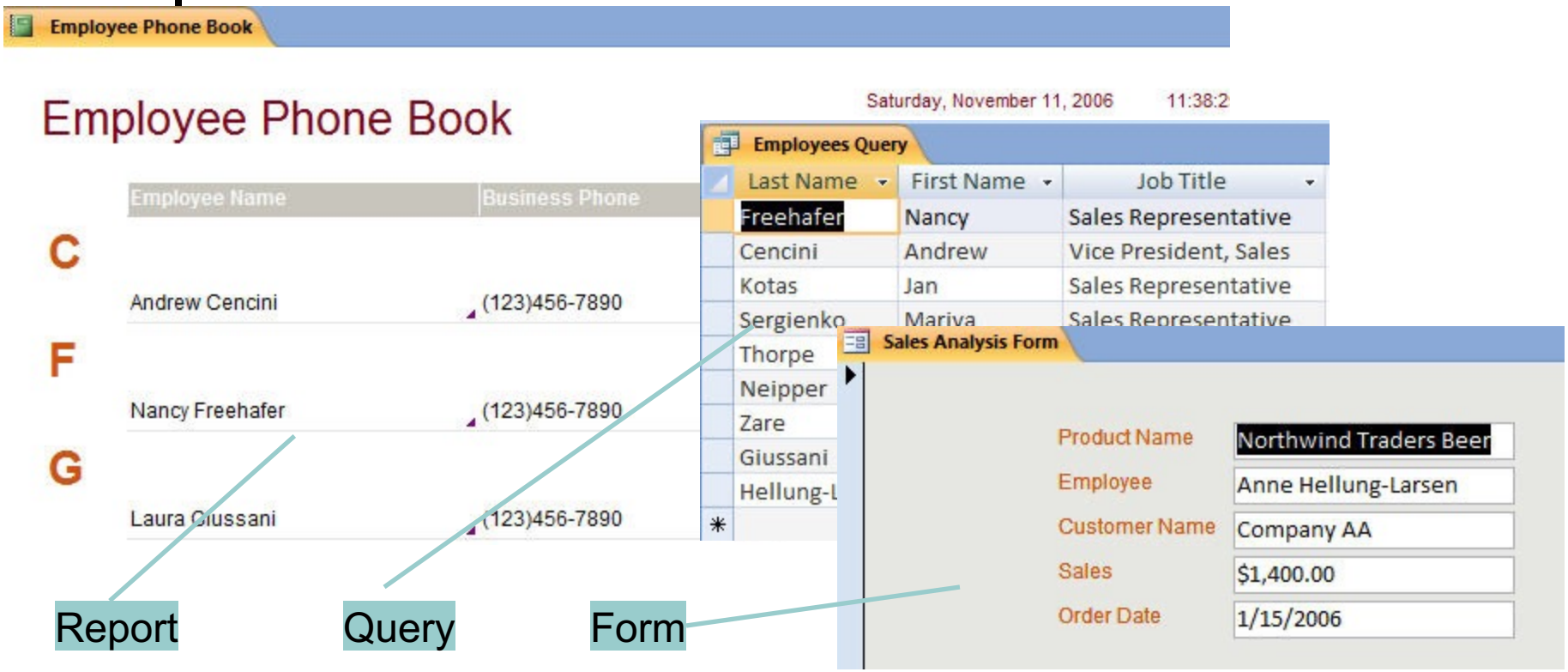
- **Foreign Key (FK)-** A field in one table that is a primary key in another table. It is with these values we can build relationships between tables.
- The values of an FK must satisfy one of two conditions:

  - any FK-value is a value appearing in the referenced table.
- **Non Key-** a regular field in a database.

Data Types

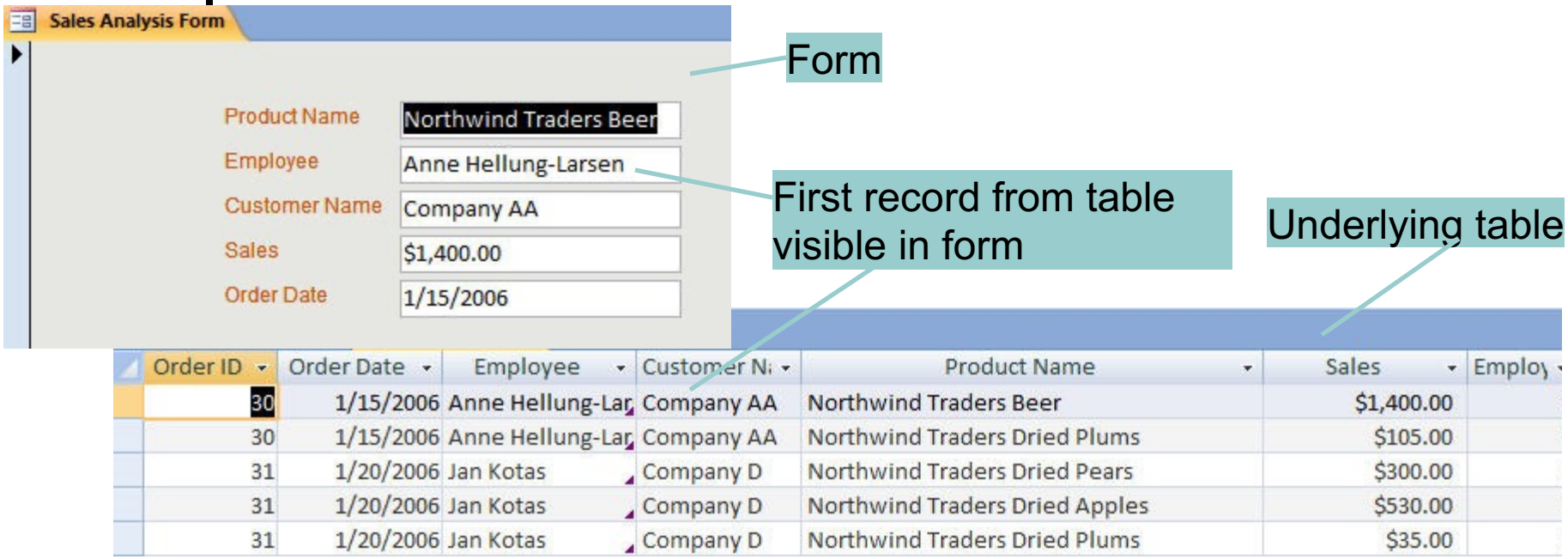
- AutoNumber – automatically increment numeric numbers
- Text – for text/words type of data
- Number – for numeric data
- Date/Time
- Currency
- OLE Objects, Hyperlink, Attachment, Memo, Yes/No

Forms, Queries, and Reports



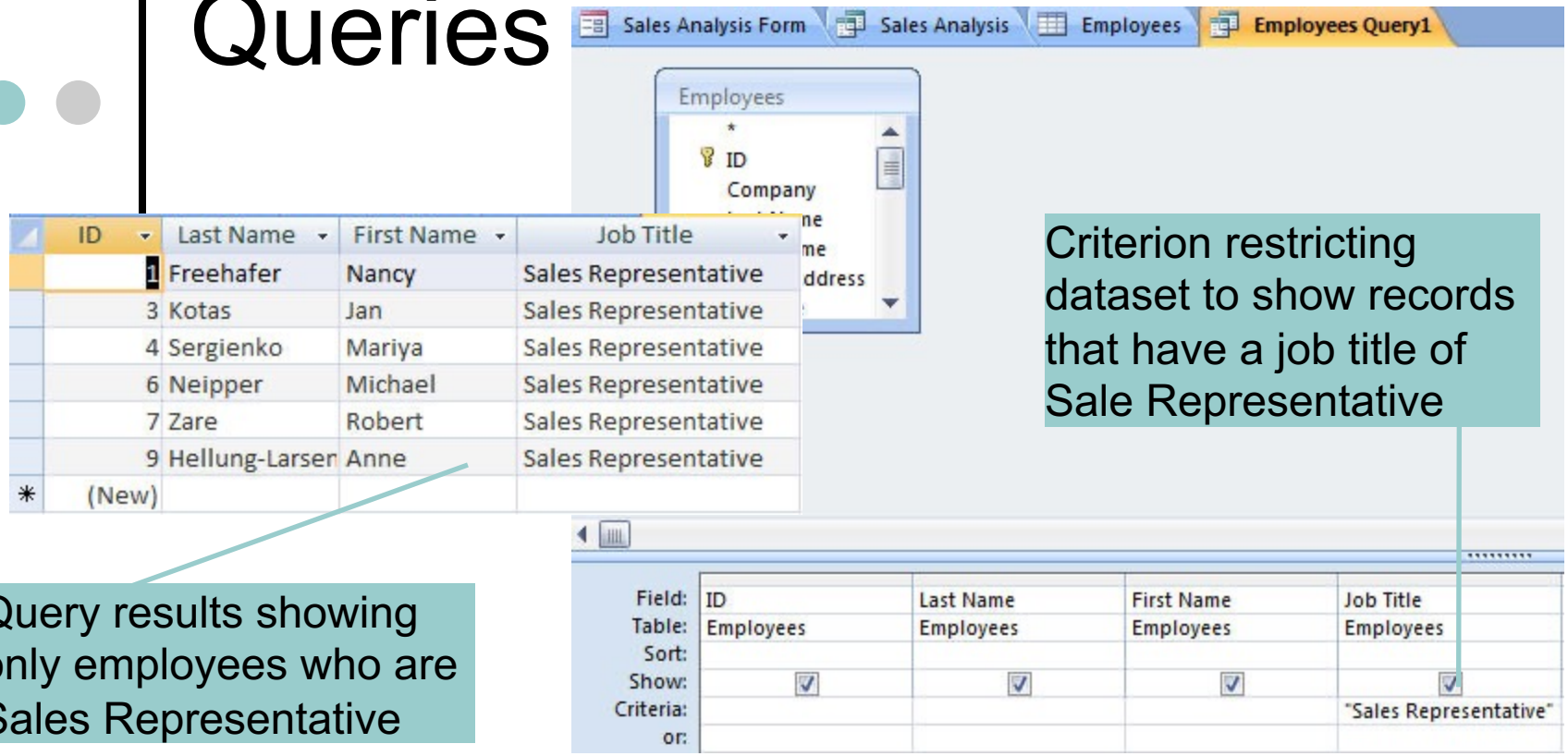
- Forms, queries, and reports are all based upon data contained in a table

Forms



- Forms allow us to create an interface that can be more user friendly and attractive than Datasheet View

Queries

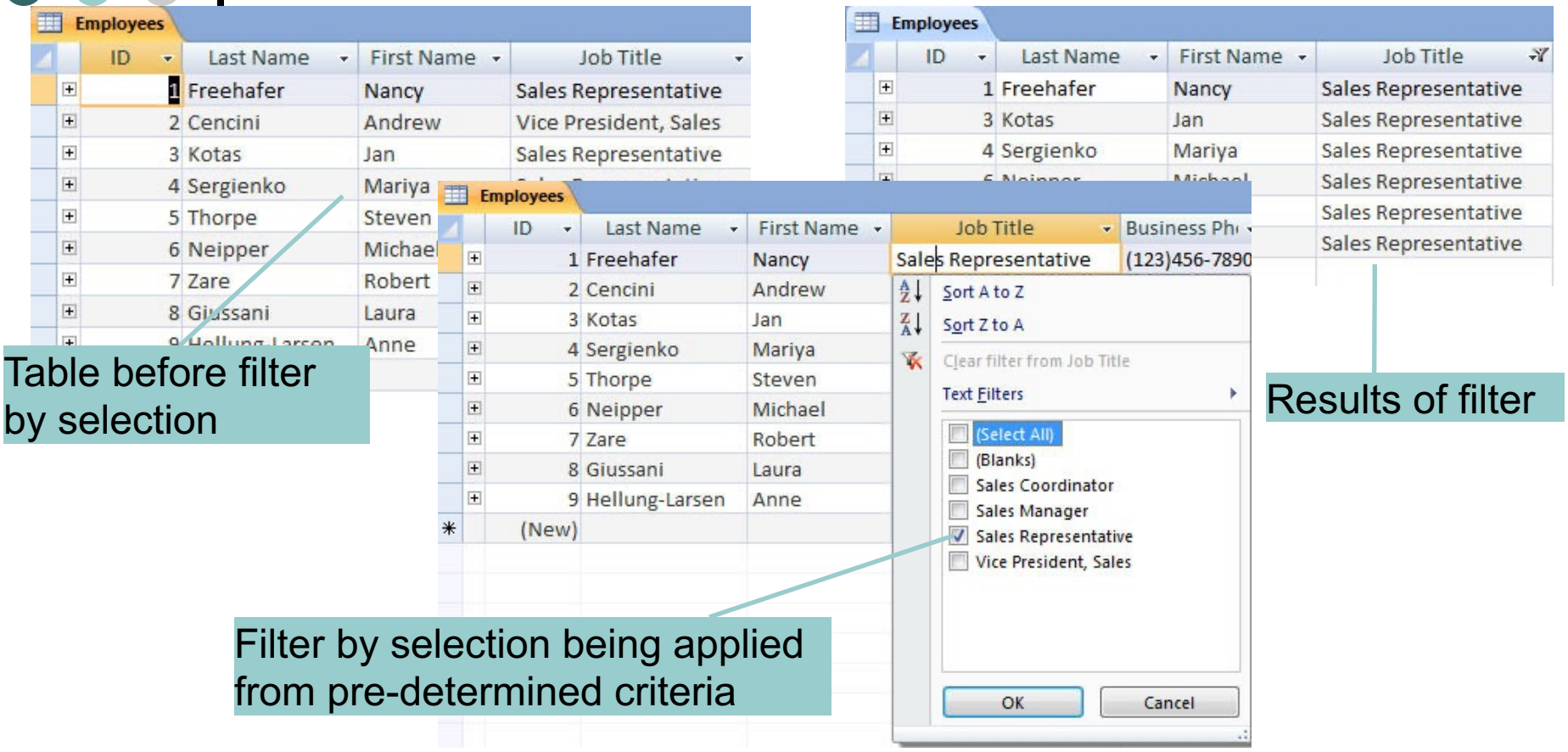


- Queries allow us to question data
- The answer to the query is a dataset
- The question asked is formed using criteria – the rules or norm that is the basis for making judgments

Filters

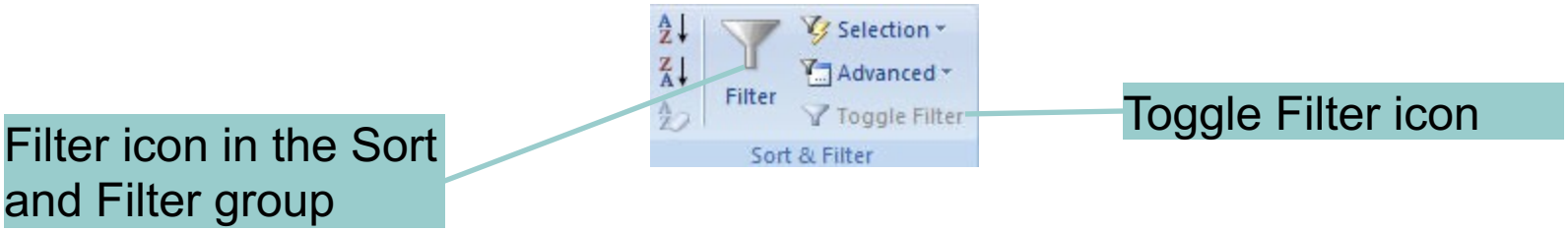
- Create a subset of records based on criteria.
- Do not change underlying table data
- Two types
  - Filter by Selection
  - Filter by Form

Filter by Selection



- Selects only the records that match pre-selected criteria

Applying and Removing a Filter



- Once a filter is applied, the Toggle Filter icon will be available
- The Toggle Filter icon can be used to apply and remove the current filter as many times as desired

Sorting Table Data

Employees

ID	Last Name	First Name	Job Title
2	Cencini	Andrew	Vice President, Sales
1	Freehafer	Nancy	Sales Representative
8	Giussani	Laura	Sales Coordinator
9	Hellung-Larsen	Anne	Sales Representative
3	Kotas	Jan	Sales Representative
6	Neipper	Michael	Sales Representative
4	Sergienko	Mariya	Sales Representative
5	Thorpe	Steven	Sales Manager
7	Zare	Robert	Sales Representative

Last Name field sorted ascending

Employees

ID	Last Name	First Name	Job Title
7	Zare	Robert	Sales Representative
5	Thorpe	Steven	Sales Manager
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6	Neipper	Michael	Sales Representative
3	Kotas	Jan	Sales Representative
9	Hellung-Larsen	Anne	Sales Representative
8	Giussani	Laura	Sales Coordinator
1	Freehafer	Nancy	Sales Representative
2	Cencini	Andrew	Vice President, Sales

Last Name field sorted descending

- Lists records in ascending or descending order according to one or more fields

Access or Excel?

Use Excel when:

- Your data is of a manageable data size
- There is no need for relationships between data
- You are primarily creating calculations and statistics

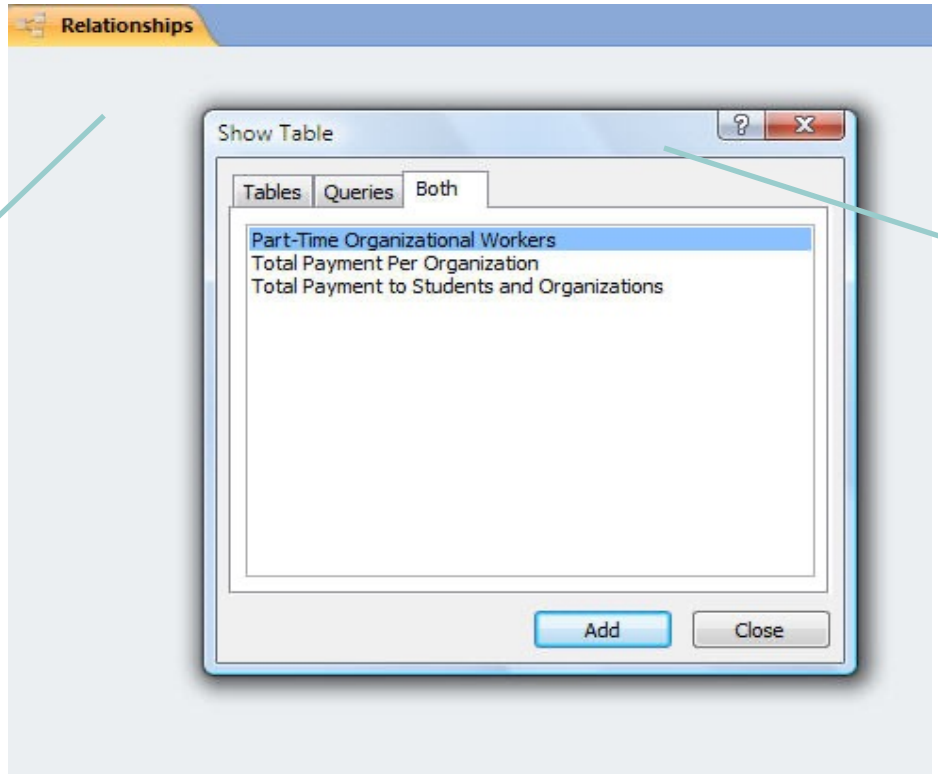
Use Access when:

- You are working with large amounts of data
- You need to create relationships between your data
- You rely on creating reports to analyze data

Relational Database - RDBMS

- Relational database management systems allow data to be grouped into tables and relationships created between the tables
- This is much more efficient than the opposite of an RDBMS which is a flat file. Flat files store data in one single file with no special groupings or collections

Using the Relationship Window

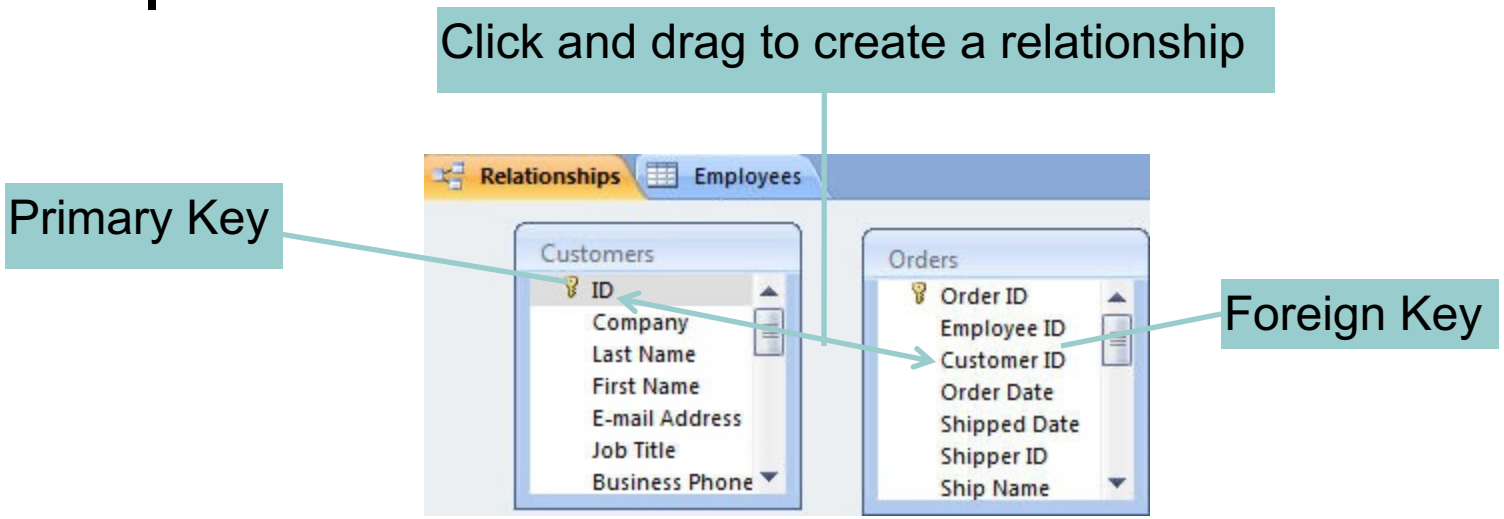


Relationship window

Show Table dialog box

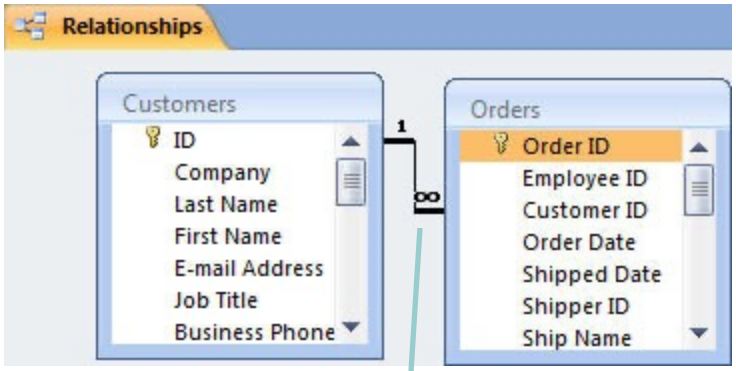
- Add the tables or queries from the Show table dialog box

Establishing Relationships



- In the Relationship window, click and drag a field name from one table to a field name in a related table

Establishing Relationships

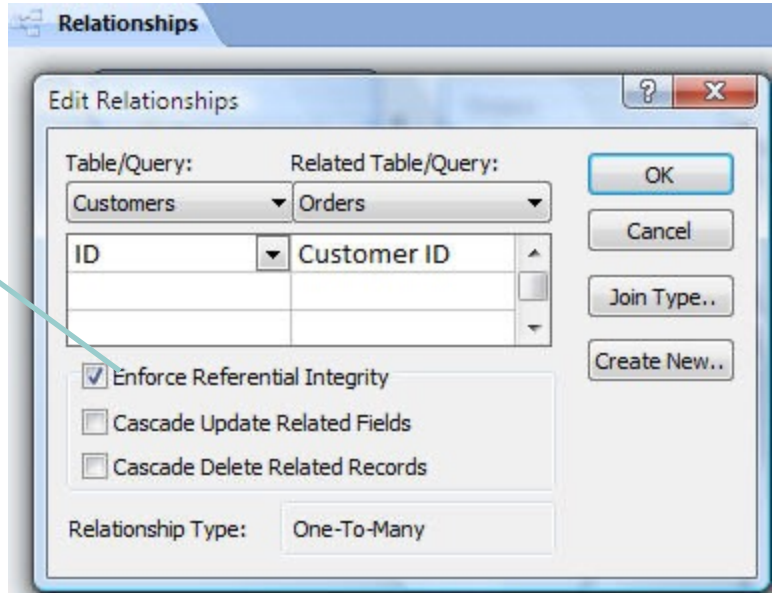


Infinity symbol notes referential integrity has been applied

- Enter the appropriate settings in the Edit relationships dialog box
- Click Create
- A join line will appear when one table is joined to another

Referential Integrity

Enforce Referential Integrity



- Referential integrity ensures that the data in a relational database maintains consistency when the data changes

TYPES OF RELATIONSHIPS

1. ONE TO ONE
2. ONE TO MANY
3. MANY TO MANY

CREATE A DATABASE NAMED LIBRARY

TABLES

BOOKS

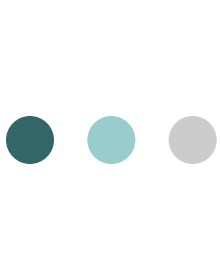
- BookID
- Title
- Author_First_Name
- Author_Last_Name
- Price

CUSTOMERS

- CustomerId
- First_Name
- Last_Name
- Phone
- Email

ORDERS

- OrderId
- BookId
- CustomerId
- Order_Date



QUERY

Pull information from more than one table at a time under specified conditona

Ansewrs to Questions on your Database..

Which customers ordered technology books ?

Query Design Basics

To make any query work you need to know the following:

1. What FIELDS do you want to see in the results?
2. Whch TABLES or queries hold the information you need?
3. What CONDITIONS do you want the data to meet?