Introduction

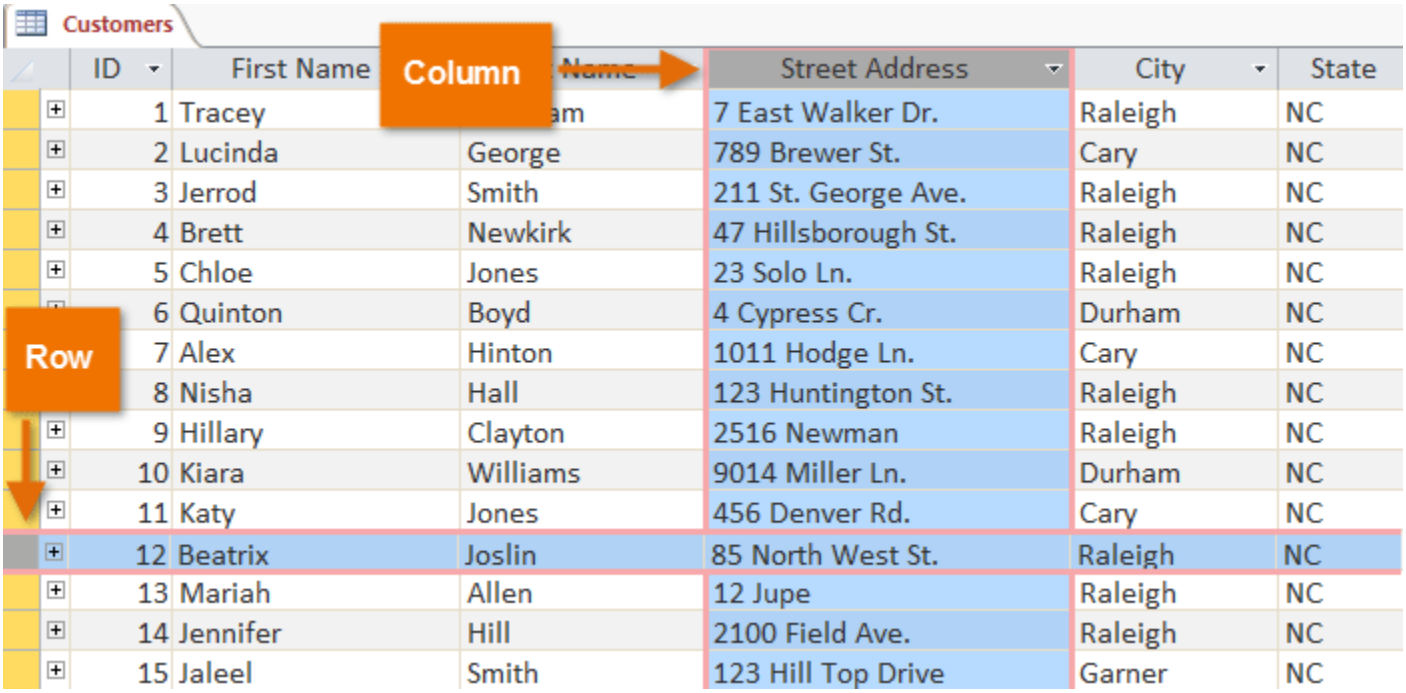
Databases in Access are composed of four objects: **tables**, **queries**, **forms**, and **reports**. Together, these objects allow you to enter, store, analyze, and compile your data however you want.

In this lesson, you will learn about each of the four **objects** and come to understand how they interact with each other to create a fully functional relational database.

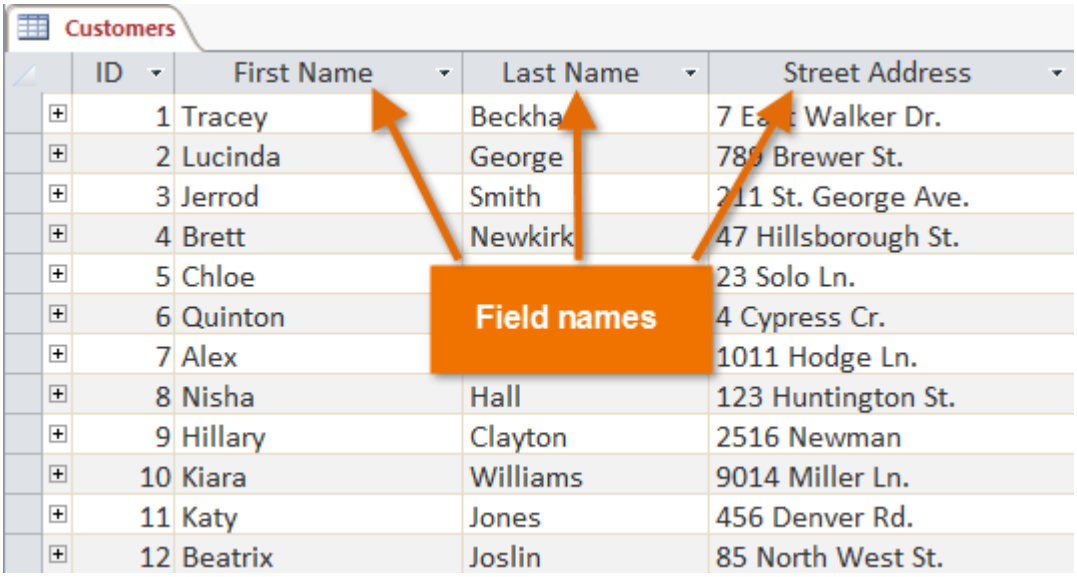
Tables

By this point, you should already understand that a database is a collection of data organized into many connected **lists**. In Access, all data is stored in **tables**, which puts tables at the heart of any database.

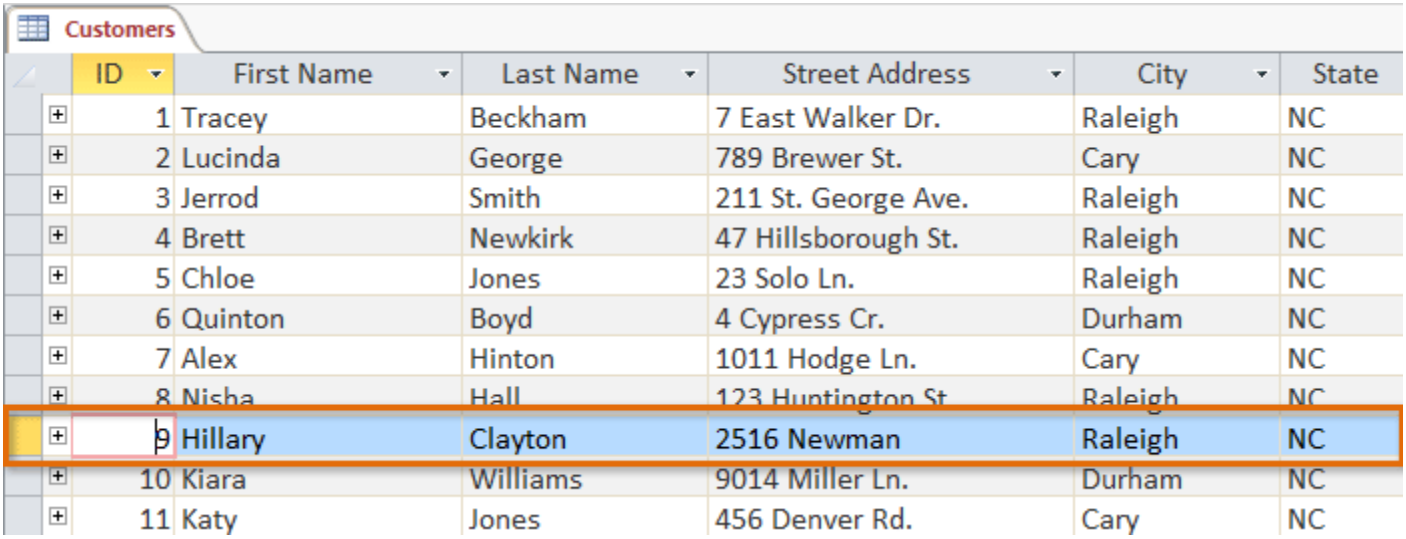
You might already know that tables are organized into vertical **columns** and horizontal **rows**.



In Access, rows and columns are referred to as **records** and **fields**. A **field** is more than just a column; it's a way of organizing information by the **type** of data it is. Every piece of information within a field is of the same **type**. For example, every entry in a field called **First Name** would be a name, and every entry in field called **Street Address** would be an address.

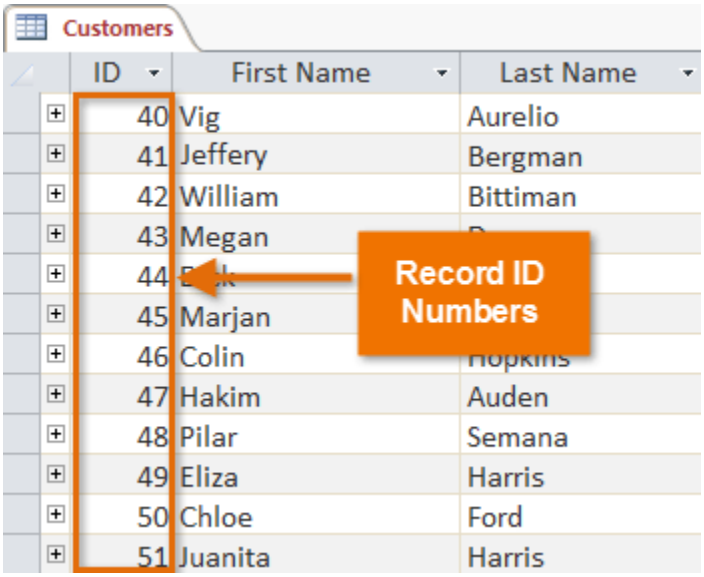


Likewise, a **record** is more than just a row; it's a unit of information. Every cell in a given row is part of that row's record.



Notice how each record spans several fields. Even though the information in each record is organized into fields, it belongs with the other information in that

record. See the **number** at the left of each row? It’s the **ID number** that identifies each record. The ID number for a record refers to every piece of information contained on that row.



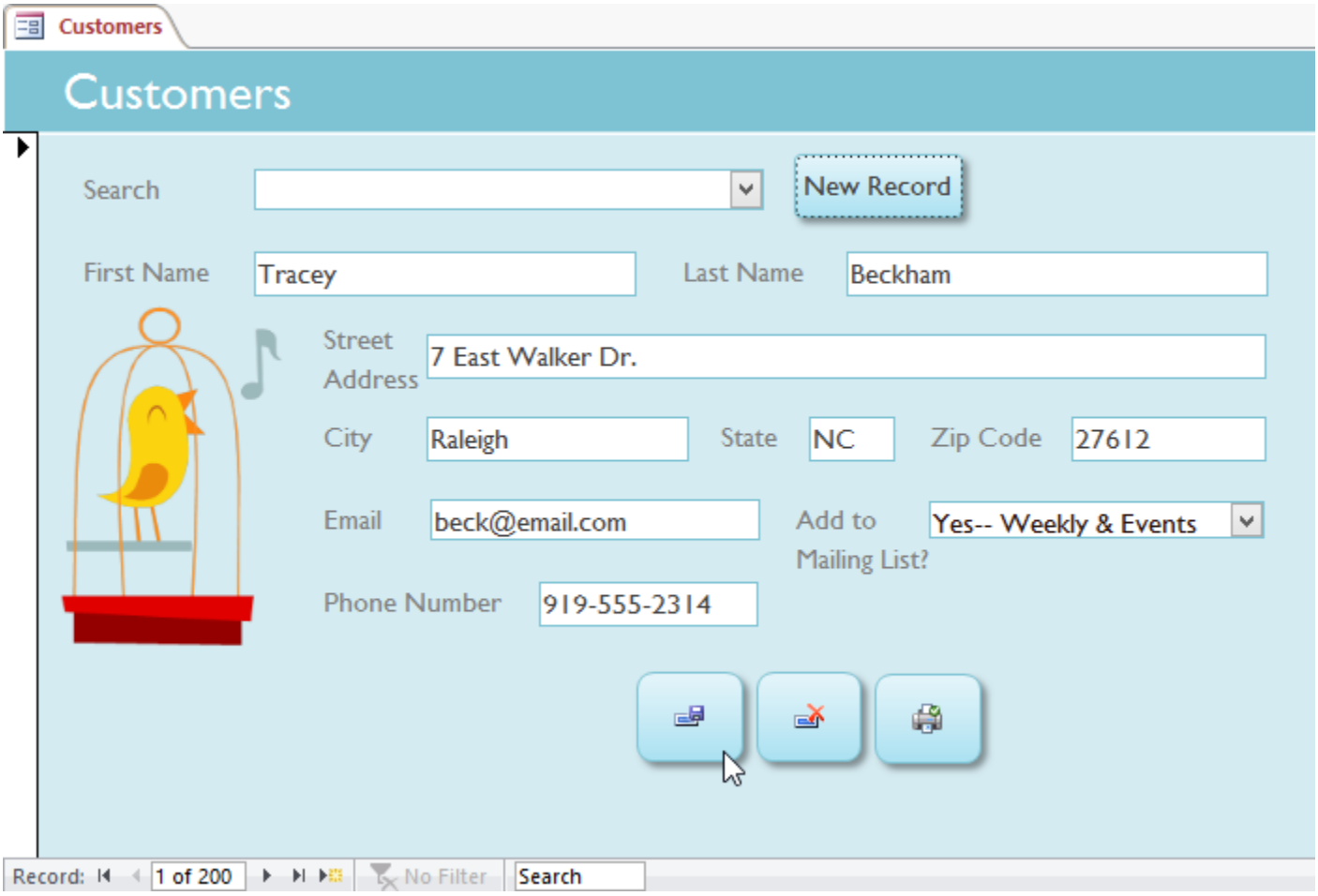
Tables are good for storing **closely related information**. Let's say you own a bakery and have a database that includes a table with your customers' names and information, like their phone numbers, home addresses, and email addresses. Because these pieces of information are all details on your customers, you’d include them all in the same **table**. Each customer would be represented by a unique **record**, and each type of information about these customers would be stored in its own field. If you decided to add any more information—say, a customer's birthday—you would simply create a new field within the same table.

Forms, queries, and reports

Although tables store all of your data, the other three objects—**forms**, **queries**, and **reports**—offer you ways to work with it. Each of these objects interacts with the **records**stored in your database's tables.

Forms

Forms are used for **entering**, **modifying**, and **viewing** records. You likely have had to fill out forms on many occasions, like when visiting a doctor's office, applying for a job, or registering for school. The reason forms are used so often is that they're an easy way to guide people toward entering data correctly. When you enter information into a form in Access, the data goes exactly where the database designer wants it to go: in one or more related tables.

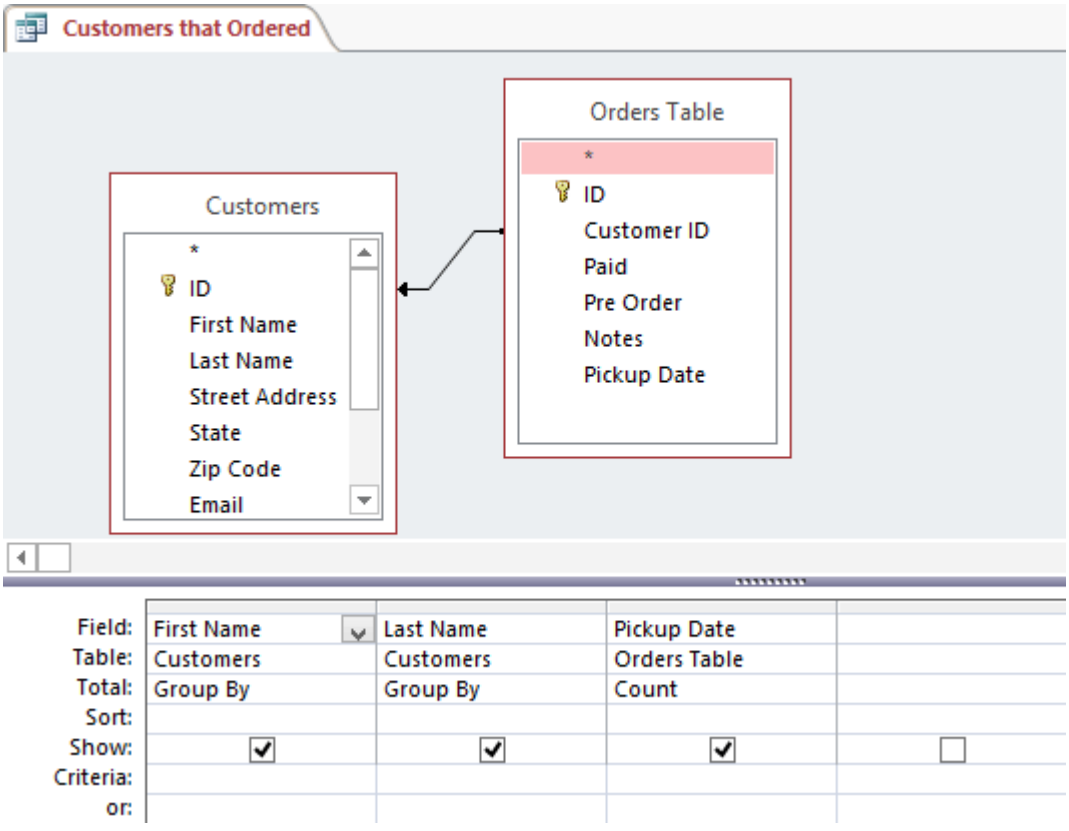


Forms make entering data easier. Working with extensive tables can be confusing, and when you have connected tables you might need to work with more than one at a time to enter a set of data. However, with forms it's possible to enter data into multiple tables at once, all in one place. Database designers can even set restrictions on individual form components to ensure all of the needed data is entered in the correct format. All in all, forms help keep data consistent and organized, which is essential for an accurate and powerful database.

Queries

Queries are a way of **searching** for and **compiling** data from one or more tables. Running a query is like asking a detailed **question** of your database. When you build a query in Access, you are **defining specific search conditions** to find exactly the data you want.

Queries are far more powerful than the simple searches you might carry out within a table. While a **search** would be able to help you find the name of one customer at your business, you could run a **query** to find the name and phone number of every customer who's made a purchase within the past week. A well-designed query can give information you might not be able to find just by looking through the data in your tables.



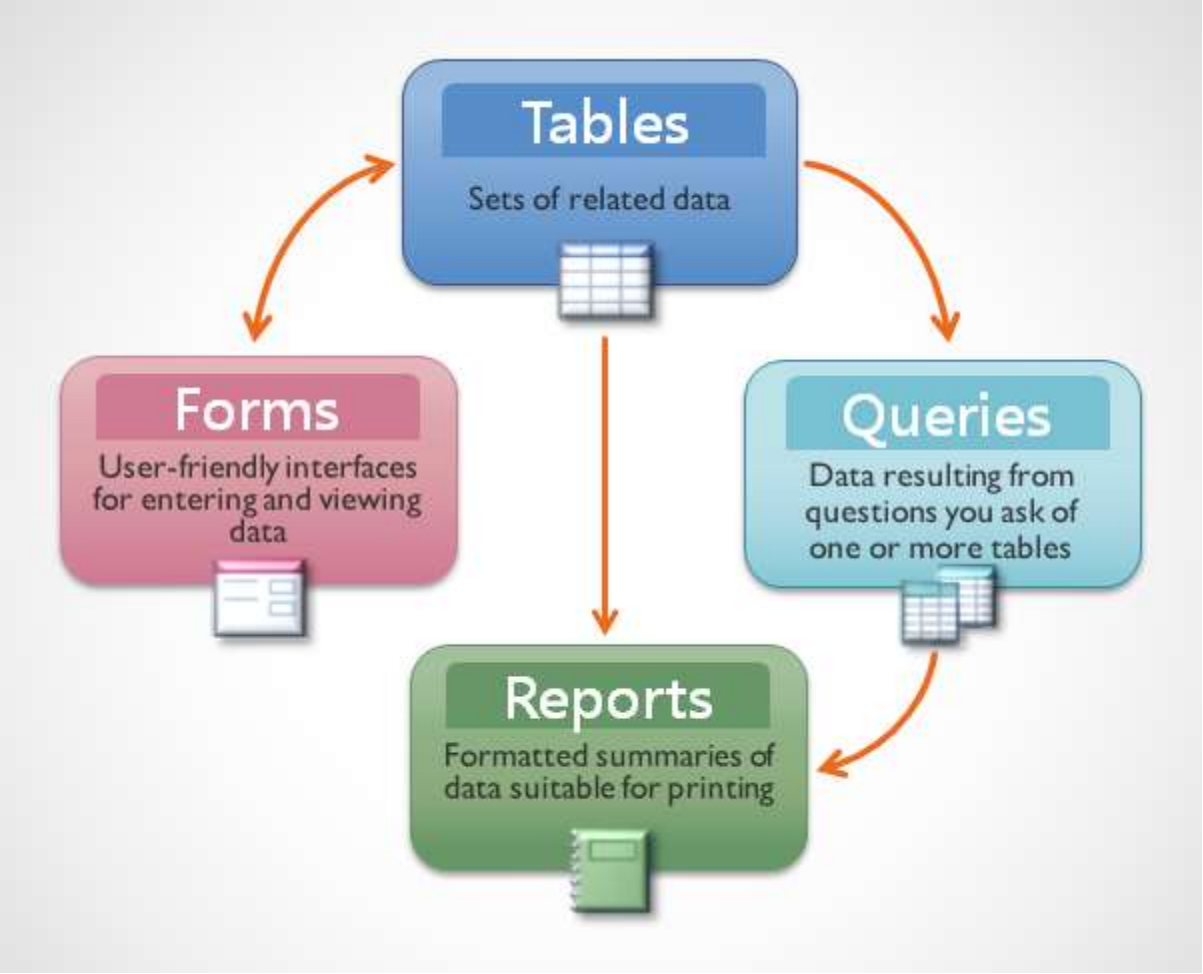
Reports

Reports offer you the ability to **present** your data **in print**. If you've ever received a computer printout of a class schedule or a printed invoice of a purchase, you've seen a database report. Reports are useful because they allow you to present components of your database in an easy-to-read format. You can even customize a report's appearance to make it visually appealing. Access offers you the ability to create a report from any **table** or **query**.

First Name	Last Name	Phone Number	Pickup Date
Andrzej	Wujek	919-555-0450	12/4/2010
Dick	Whitman	919-555-5042	12/4/2010
Xy'nya	Bell	919-555-0758	12/9/2010
Xiaoxi	Zheng	919-555-2786	12/10/2010
Hakim	Auden	919-555-0045	12/14/2010
Zoey	Altman	919-555-6688	12/15/2010
Raphaelle	Duvalier	919-555-1547	12/15/2010
Zoey	Altman	919-555-6688	12/16/2010

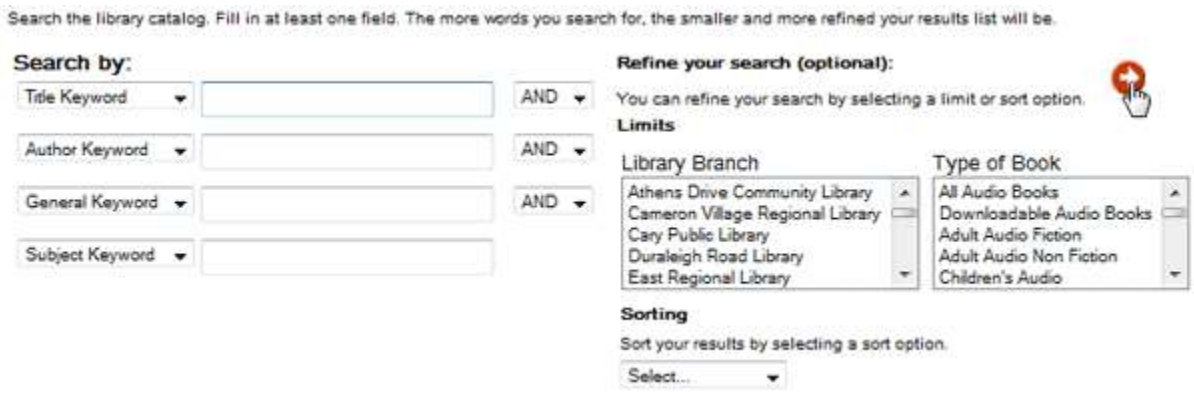
Putting it all together

Even if you have a good idea of how each object can be used, it can initially be difficult to understand how they all work together. It helps to remember that they all work with the same data. Every piece of data a **query**, **form**, or **report** uses is stored in one of your database **tables**.

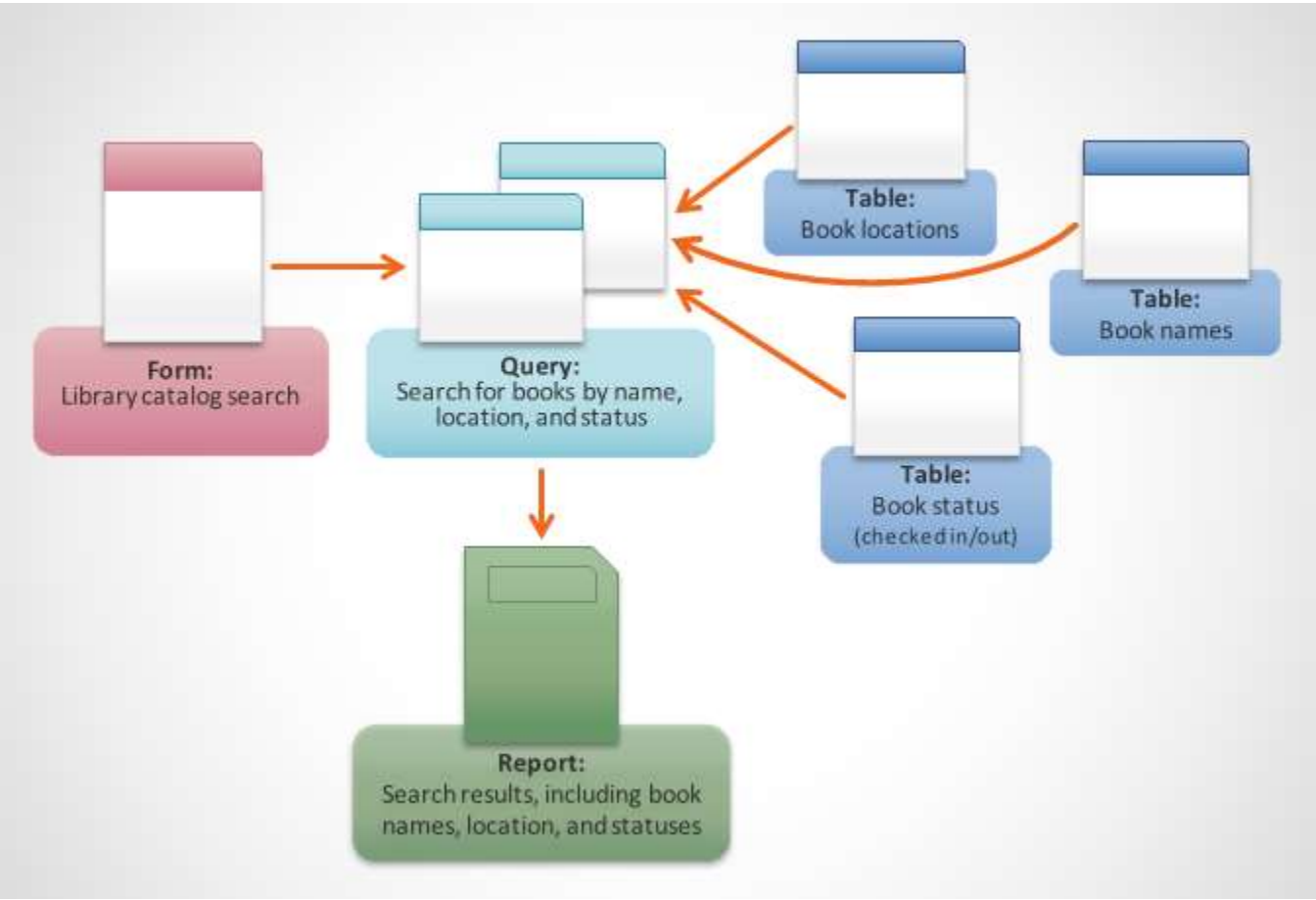


Forms allow you to both **add** data to tables and **view** data that already exists. Reports **present** data from tables and also from queries, which then **search for** and **analyze** data within these same tables.

These relationships sound complicated, but in fact they work together so well and naturally that we often don't even notice when we're using connected database objects. Have you ever used an electronic card catalog to search for a book at the library? Chances are, you entered your search in something that looks like this:



When you performed your search, you were entering your search terms into a **form** that then created and ran a **query** based on your request. When the query finished searching the database's **tables** for records that matched your search, you were shown a **report**that drew information from the query and the related tables—in this case, a list of books matching your search terms. You could represent the connections between the objects like this:



Let's say instead of using these tools you had to search within a giant table containing every book in the library system. The relevant records would likely be spread out across many tables: a table for book titles and descriptions, a table containing information on which books are checked in or out, and a table with each branch of the library, just to name a few.

You'd have to search at least three tables just to find a book, learn its location, and see whether it's checked in! It's easy to imagine how difficult it could become to find the right book. If you weren't careful, you might even mess something up by accidentally deleting or editing a record. It's easy to see how the database objects make this search much more manageable.

In our **Introduction to Databases lesson**, we discussed the concept of a **relational database**, which is a database that is able to understand how different sets of data **relate** to one another. Situations like the example above are exactly why people find relational databases so useful. Without a relational database, what should be a simple task—searching for a book and seeing if it's checked in and where—becomes incredibly complicated and time consuming. Knowing how to use the four Access objects can make even complicated tasks fairly user friendly.