

# CHAPTER 1: DATABASES

“Has everyone noticed that all the letters of the word ‘database’ are typed with the left hand? The layout of the QWERTY typewriter was designed, among other things, to facilitate the even use of both hands. It follows, therefore, that writing about databases is not only unnatural, but a lot harder than it appears.”

– Dan Galvin

**O**rganizing data is nothing new. Telephone books, stock market reports, telephone books, and the register in your checkbook are all examples of organized data.

## WHY NOT A SPREADSHEET?

Many people manage data in spreadsheets. For small data sets—say, hundreds of records—a spreadsheet may be appropriate. After all, Excel—like Access—allows you to:

- organize data in tables;
- sort and filter data;
- use calculations to manipulate data; and,
- generate reports in multiple formats.

Plus, Excel is a widely-used application, so you already may know how to use many of its features. If you are managing simple lists, Excel may be appropriate. Still, Excel was not designed to manage large amounts of data, especially when that data is interrelated.

For most situations, an Access database is faster, more flexible, more reliable and more appropriate if:

- you have large amounts of data (up to 65,535 characters per “cell”);
- the data is interrelated (Access is a relational database, able to link data in multiple tables in complex relationships);
- you share data over a network (Access supports up to 255 concurrent users);
- you need run select and filter data according to complicated rules; or,
- user-level permissions and other security measures are important to limit access or editing privileges to different users in different ways.

Data integrity is more reliable with a database. Entering data is easier and, generally, more user-friendly.

## THE TABLE CONCEPT

A database organizes data in a specific way—in a table of rows and columns, similar to a spreadsheet. Each row is called a **record**; each column is called a **field**. If you were to organize your addresses into a table, it might resemble Figure 2. Each name, address, and phone number constitutes a record. Figure 2 displays seven records and six fields: LastName, FirstName, City, State, ZIP, and Phone.

LASTNAME	FIRSTNAME	CITY	STATE	ZIP	PHONE
Anderson	Bill	Ames	IA	50010	555-7459
	Cher	Hollywood	CA	99452	
Smith	David	Waco	TX	64209	555-9999
Spies	Wayne	New Haven	CT	06511	555-5982
Aldrich	Howard	Chapel Hill	NC	02788	555-4882
Spies	Les	Hudson	IA	50192	555-9245

Figure 2

Each record contains related data, grouped in columns, or fields. Not *every* record has data in *every* field. For example, Cher is a mononym, and I don’t know her phone number; these fields are blank.

## SORTING

Of course, a database is a lot more than just storing data. The ability to sort data is a key feature of databases. In Figure 3, records have been rearranged in telephone book style—sorted alphabetically by last name and then by first name (e.g., Les Spies appears before Wayne Spies.)

LASTNAME	FIRSTNAME	CITY	STATE	ZIP	PHONE
	Cher	Hollywood	CA	99452	
Aldrich	Howard	Chapel Hill	NC	02788	555-4882
Anderson	Bill	Ames	IA	50010	555-7459
Smith	David	Waco	TX	64209	555-9999
Spies	Les	Hudson	IA	50192	555-9245
Spies	Wayne	New Haven	CT	06511	555-5982

Figure 3

## SELECTING

Let's say you were planning a trip to Iowa. Instead of pawing through your address book, wouldn't it be nice if you had a magic address book that could display only your friends in Iowa, without deleting the others? Your magic address book might then resemble Figure 4.

LASTNAME	FIRSTNAME	CITY	STATE	ZIP	PHONE
Anderson	Bill	Ames	IA	50010	555-7459
Spies	Les	Hudson	IA	50192	555-9245

Figure 4

In addition to sorting, the ability to select only those records that meet certain criteria is one of the most important functions of a database.

## FLAT-FILE DATABASES

Another example of a database that you use every day is your checkbook register, seen in Figure 5. Each time you write a check, you record the check number in the first column (the Check field), the date you wrote it in the second (the Date field), a description in the third (the Description field) and so on. Figure 5 shows a check register with six fields and four records.

CHECK	DATE	DESCRIPTION	DEPOSIT	WITHDRAWAL	BALANCE
1882	3/1/04	Les Spies		158.98	357.21
1883	3/2/04	B. Anderson		20.00	337.21
	3/2/04	Paycheck	400.00		737.21
1884	3/3/04	Drugstore		13.11	724.10

Figure 5

A table, with data organized in records and fields, is the essential element of a database. A database with only one table, such as the address book in Figure 2 or the check

book in Figure 5, is called a "flat-file" database. Spreadsheets are essentially flat-file databases.

## RELATIONAL DATABASE

Unlike a flat-file database, a *relational* database has the ability to link related data from one table to data in another. This would give you the ability to link your address book to your check register. That way, you could pull out related information from both—such as the names *and* addresses of all those to whom we had written checks over \$100.

## DATABASE OBJECTS

Although Access is often referred to as "a relational database," it is more properly known as a "Database Management System," or DBMS. An Access DBMS is a collection of related data and the objects associated with that data. There are seven classes of objects:

- **Tables** contain data—the heart of a database.
- **Queries** are the brains of a database. Queries are questions that you ask of your database.
- **Forms** are the interfaces appearing on the screen.
- **Reports** are similar to Forms, but instead of appearing on the screen, Reports are printed.
- **Pages**, new to Access 2000, enable you to publish information to the Web easily.
- **Macros** offer a low level of database automation.
- **Modules** offer a high level of automation, based on Visual Basic.

All of these objects, along with their associated data, exist within a single \*.MDB file.

## FLOPPY DISKS

That single \*.MDB file will get very big, very fast. That's one reason why Access doesn't like floppy disks. Here's another: a database on a floppy runs very slowly.

Finally, because of the way that it saves data, if you place a database on a floppy disk, you must not remove that floppy until you have closed Access—the entire program—completely. If you want to share your database with someone, you can't just swap disks, and try to Save or Save As, as you might in some programs. Instead, you must close Access, and then copy the database with Windows® Explorer or some other file management tool.

## CONVERTING V. ENABLING

Prior to Access 2000, Access databases were not backwards compatible. In other words, if you created a database in one version of Access, you could neither use it nor convert it for use in prior versions of Access. There was no “Save As” feature to allow you to save it as a previous version. Indeed, the Save As feature doesn’t save the database at all, but merely exports a piece of it.

If you had a database created by an *older* version of Access and wanted to open it in a *newer* version:

**Step 1:** From the pull-down menu, select File, Open; navigate to the old database and click .

**Step 2:** You have two choices; either:

- *enable* the old database for use in the new version of Access; or,
- *convert* the old database into the new version.

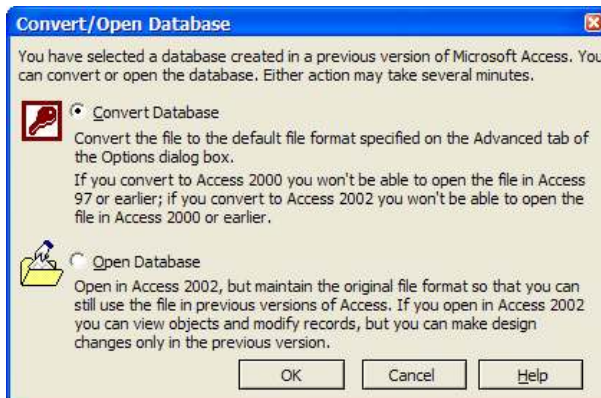


Figure 6

Unfortunately, “enabling” a database—bringing a database created in previous version of Access for use in a later version—did not allow you to modify its objects or controls. Even worse, you couldn’t apply many features of the new version to the old data. To make changes like these, you can’t just enable an old database; you must convert it.

Once converted to a new version, you could no longer convert it back to previous version of Access. This changed with Access 2000, which introduced a utility that converts databases to a previous version. To convert an Access 2000/XP/2003 database to Access 97:

**Step 1:** From the pull-down menu, select Tools, Database Utilities, Convert Database and select either:

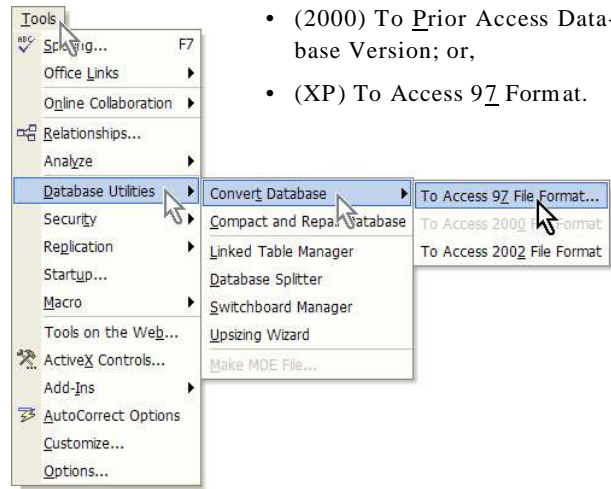


Figure 7

- (2000) To Prior Access Database Version; or,
- (XP) To Access 97 Format.

**Step 2:** Give it a new name and click .

As you’d expect when you convert a document to an earlier format, this process will eliminate features introduced after the old version.

## DEFAULT FILE FORMAT

Since converting is such a headache, if you work in a multi-version environment, you can tell Access to create files in a previous format by default:

**Step 1:** From the pull-down menu, select Tools, Options.

**Step 2:** On the Advanced tab, select the format you want under Default File Format:

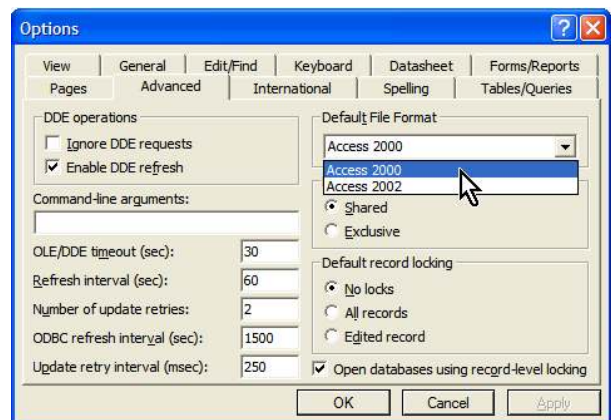

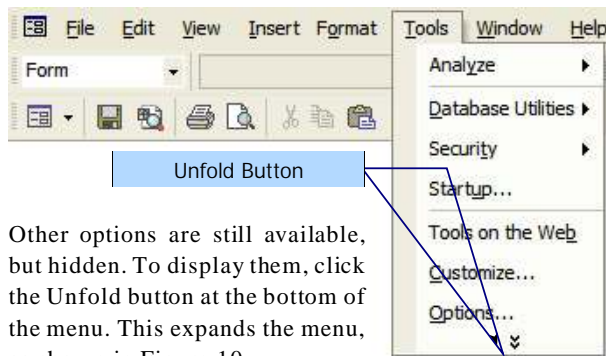


Figure 8

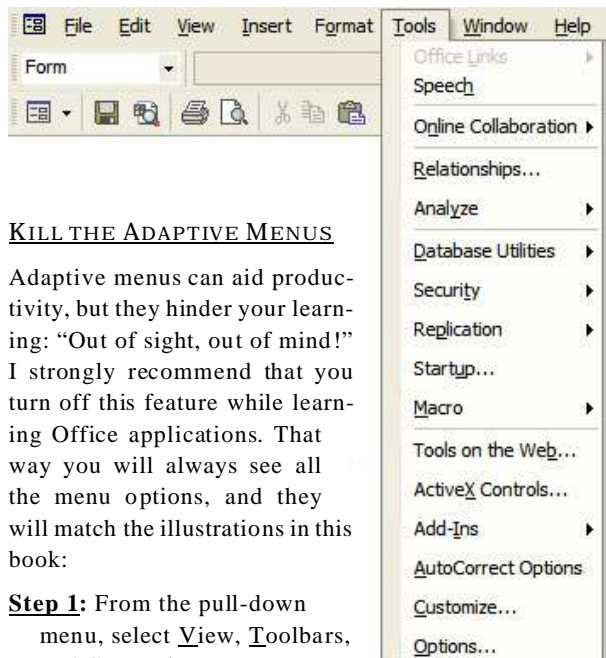
**Step 3:** Click  to apply your changes and close the dialog.

## LOOK LIKE THE BOOK

While it may or may not be true that the most important thing in America is to look like everyone else, it will help you if your interface looks like the pictures in this book. Access, like its Office brethren, has employed adaptive menus since 2000. This feature was designed to combat menu-bloat—ever-lengthening with new features from each new release—by hiding the items that you rarely use. It may not be a bad idea for veterans, but it's lousy for learners. Here's how they look in Access.



Other options are still available, but hidden. To display them, click the Unfold button at the bottom of the menu. This expands the menu, as shown in Figure 10.



### KILL THE ADAPTIVE MENUS

Adaptive menus can aid productivity, but they hinder your learning: “Out of sight, out of mind!” I strongly recommend that you turn off this feature while learning Office applications. That way you will always see all the menu options, and they will match the illustrations in this book:

**Step 1:** From the pull-down menu, select View, Toolbars, and Customize.

**Step 2:** On the Options tab, deselect the “Menus show recently used commands first” check box

in the Personalized Menus and Toolbars section shown in Figure 11.

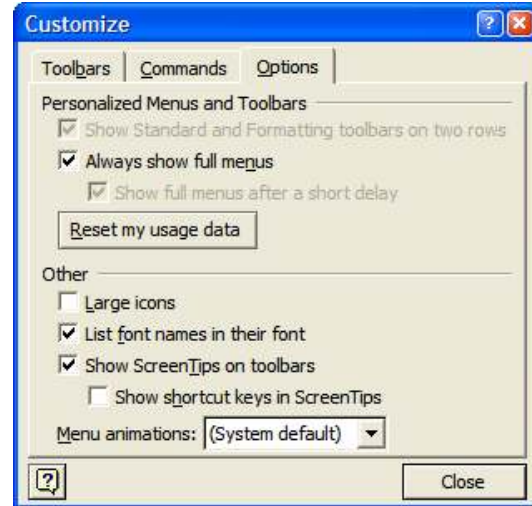


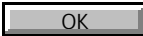
Figure 11

## THE WINDOWS® TASKBAR

Before Office 2000, when you opened an Office application, such as Microsoft® Word, you would get a Word icon in your Task bar. If you opened multiple documents, you only had one icon in the Task bar.

Starting with Office 2000, Microsoft changed this behavior. Now, when you open a second document in Word, you will see two Word icons. This also happens in Access. Every time you open an object, a new Access icon appears in the Task bar. For anyone half-fluent in Access, this only clutters your work. To turn off this dubious feature:

**Step 1:** From the pull-down menu, select Tools, Options.

**Step 2:** On the View tab, deselect the Windows in Taskbar check box and click .

Now, only one Access icon will appear on the taskbar, regardless of the number of Access windows are open.

## NOTES

Figure 10