

International Association of Administrative Professionals and Greg Creech present –

Building a Relational Database using Microsoft

Access

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 Instructor
- ✓ CompTIA Certified Technical Trainer

Wednesday, July 31, 10:00 AM – 12:00 PM



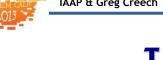


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Oops! and Legal Stuff

While I have made every effort to ensure the accuracy of this document, including grammar and instructions, I make mistakes. (Surprise!) If you find an error or want to provide constructive feedback, please contact me. Thank you! Enjoy Your new Office and this document.

Greg Creech *Techedutainment Services, Inc.* P. O. Box 1431 Pine Lake, GA 30072

www.gregcreech.com

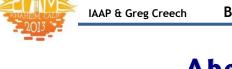
Association Memberships, Certifications, and Awards:

- ✓ International Association of Administrative Professionals Atlanta Chapter
- ✓ American Society of Training and Development Member Atlanta Chapter
- ✓ Society for Human Resources Management Atlanta Chapter
- ✓ Microsoft Office User Specialist Certification Instructor
- ✓ A+ Certified through CompTIA
- ✓ Microsoft Certified Technical Trainer
- ✓ 2007 Top Non-Credit Programs (my Microsoft[®] Office Suite) by University Continuing Education Associations' Southern Region
- ✓ 2009 Faculty Award for the Association of Continuing Higher Education (for my work at Emory University)

Access [®] is a most excellent product from Microsoft [®] Corporation and is part of the Office [®] Suite (including Office 2007/2010 [®] of products and services, including Word, Excel, PowerPoint, Access, Outlook, and other fantastic programs that help me to be productive and profitable.

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About Greg Creech and IAAP

On January 5, 1981, I entered the world of being an administrative professional as the only male Steno Clerk in Columbia, SC at Southern Bell. As my manager, Becky Davis, introduced me to all of the women, one funny woman exclaimed: "Well, there goes the steno pool; they let a rooster in the hen house!" Later in the day, I used an IBM Selectric typewriter to type a proposal. As it typed, I noticed the silence in the room and looked up to see everyone staring at me. The funny woman said: "I've never seen a man that could type like that. Who would've thought." I could type 70 WPM with no mistakes. I worked in Sales and Marketing at AT&T in many clerical, administrative, and management positions. My longest responsibility for over 10 years was as a Compensation Manager in Sales and Marketing for various sales organizations , and in 1998, I took an early retirement buy out package as an Operations Manager. AT&T supported my comedy, musical, and motivational presentations internally and externally, too, so I had the best of both worlds: administrative position and entertaining presenter. I continue to enjoy at&t as a customer and supplier as I train on and develop Access databases for at&t.

Since 1998, I have pursued my passion and love of technology, education, comedy/humor, music, and administration. In April, 2006 for Administrative Professional Day, I presented my musical, humorous stress management speech at Midlands Technical College with over 650 admins in my home town of Columbia, SC. Four months later, I and Mary Stuckey, my neighbor, were at a neighborhood meeting and she informed me that she was being installed as President - Georgia Division of IAAP. Mary and I have been neighbors for 9 years at that point and we never knew of our administrative connections. I told her about my presentations and programs. In November, 2006 at an IAAP Educational Seminar in Macon, GA I presented my humorous, musical presentation on business communication, stress management, and career development entitled "SMILE". I joined IAAP in 2007. The presentation was a hit and I have been blessed by frequently presenting at chapter meetings, conferences, and other events. Being at EFAM is an absolute dream come true for me and I owe much thanks to my sisters in Georgia chapters for all of the good recommendations, referrals, prayers, and compliments. I hope you enjoy my presentations as much as I enjoy presenting them.

About the Session and manual

This handout is a sample of a much larger Access book/manual that I have written and have available for purchase at my website - www.gregcreech.com. I concentrate on Access 2007, as many of the features transfer to Office 2010. In October 2010, the IAAP Dogwood Chapter sponsored an Admin education seminar and LaTonya Blount had me speak on Microsoft's Access. I built an IAAP chapter membership database in the class and now offer the database for you to learn and use - there will be future versions for you to practice "Access for Admins" and to use for your chapter/organization. As an Admin Clerk in the 1980's knowing relational databases got me promoted and honored plus I avoided layoffs as a manager that controlled Access and other databases that I developed for my branches and areas. This session compresses a week's worth of learning in two hours. You may not be able to build a database from scratch after this session but you will know the database objects' purpose, design, and properties plus you have this manual and database sample to help. You may order my full 350 + manual through my website - I'll have an extensive overhaul of the manual for Office 2013/365 available in the September, 2014.

I am updating all of my manuals, materials, files, and videos to Office 2013/Office 365, so look for my updated materials over the next year (or so) for Access, Excel, PowerPoint, Word, OneNote, Outlook, Windows 8 and combinations of applications. You may view descriptions and purchase my materials through <u>www.gregcreech.com</u>. I have free handouts, like this one, and other materials available at my website, too. Finally, since 1981 I have built, greatly modified/enhanced, and developed Access databases for many organizations including these:

- Emory University Divisions including Department of History, Psychology, and Psychiatry, Candler School of Theology, Facilities Management, Emory Center for Injury Control, Emory/Grady Trauma Center, and School of Medicine
- ✓ The Carter Center
- ✓ The Epstein School
- ✓ Children's Health Care of Atlanta
- ✓ AT&T

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Databases: What a concept Databases from concept to reality

What databases are and what databases are not

"This database, that database, and the other database," we hear the word database in our everyday language, now. What used to be a little known term to most people, except database administrators and programmers, the term is now commonplace and can mean different things to different people.

Databases are tracking mechanisms and designed to ensure accuracy and integrity with the data it tracks. **Databases** can act in different ways to resemble **spreadsheets**, **word processing** and other types of programs; however, **databases** are not designed to be graphic or presentation programs nor are they designed to replace word processing and spreadsheet applications. Although some spreadsheet and word processing programs allow you to create tables that can contain tracking data, these databases are very simple (comparatively speaking) and cannot be relational databases.

I have misused *spreadsheet applications*, such as *Excel* to become tracking systems. This is a common mistake. *Spreadsheet applications* are deceptively simple in being used as tracking systems; however, they offer little in data integrity and are not as easy to extrapolate data or to perform certain tasks, such as sorting by multiple areas. Spreadsheets cannot produce powerful and attractive reports and forms without extensive programming. However, data analysis, statistics, and other number crunching features make using *Excel* or other spreadsheet applications popular with a database, such as *Pivot Tables and Scenario Manager*.

On the other hand, databases have been misused as spreadsheet programs and "number crunchers". For scientific data and complex business calculations as well as dynamic charts, spreadsheet programs are the best solution. With *Open Database Connectivity (OBDC)* we are able to transport data from databases to other programs and other databases with relative ease. We will examine this later in our course.



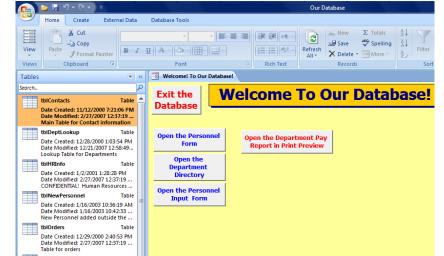


The ability to quickly add, change, and delete data and view the changes instantaneously help make databases popular in today's environment. Once upon a time, years ago when databases had to be refreshed overnight or the good-old days of batch programs. Some of these databases still exist; however, on-line databases, networking, and other technological advancements are making life and business easier and quicker to update. *Databases* that once required extensive programming and tons of code are more easily accomplished and *Access* is a great application for database management.





- 1. Please open the 2007 Access DB.accdb.
- 2. Access opens at the Main Menu welcoming you to the database.
- Press the F11 key on your keyboard - this opens the Navigation Pane at the Tables view.
- 4. In your list of tables, double click the item tblPersonnel or select the item tblPersonnel



and click the View Button and from the list select Datasheet View. Pictured at right is the Datasheet view of tblPersonnel.

View Paste Format Painter		Refresh Rich Text	New ∑ Totals Save ♥ Spelling Delete Records	2↓ X↓ Filter V Toggle Filter Sort & Filter	Find Find Eind Find Find	(Seeing is believing
Datasheet View	Welcome! To Our Database!	tblPersonnel	Records	Sort & Filter	Find	
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Design View Table		11 1/7/2001 Lady 1 1/15/2001 Greg 21 8/15/2002 Tom	Colburn	389 Pine Ridge 1333 LaVenture	Decatur G Chamblee G Alpharetta G	the

and terms will help us in our learning). With tblPersonnel open in Datasheet view: Let's get acquainted with some of the terminology of databases and Access.





Field – A field is the lowest level of data in a database. Fields consist of information about the item you are tracking. For example, if you are tracking people or human resource data some of the fields you would want to include would be First Name, Last Name, Social Security Number, and so on. We will study fields and types of fields in detail and look at some of the "intelligence" we can give to fields. In tblPersonnel the SSN, the First Name, and the Last Name are fields and are pictured below.

Record – A record is a collection of fields for an item you are tracking. For example, a record consists of all the fields for a person if you are tracking associates in a company. One associate should have one record in a the tblPersonnel table in order to be included in the company's other tables and database objects. Kermitt Frogg's record is the first one we see.

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	tblContacts	Table 🔺		000-00-0011	57	1/8/2005	Kermitt	Frogg	1 Lilly Pad Road		Lake City	FL	32222-0002	k
	Date Created: 11/12/2000 7:21:0			± 002-20-2022	47	12/26/2004	Maxwell	Smart	1567 Secret Hic	Suite 30	Atlanta	GA	30319-3040	g
	Date Modified: 2/27/2007 12:37	:19		1010-45-0239	62	1/15/2005	Morticia	Addams	1358 Mockingb		Jacksonville	FL	27272-7033	n
	Main Table for Contact information				24	10/1/2002	Janis	Smith	60 5th Ave	Suite 61	New York City	NY	01234-	j:
_	tblDeptLookup	Table		 ① 033-05-3894 	45	12/23/2004	Marilyn	Monroe	1359 Hollywoo	Apt 3A	Los Angeles	CA	01980-	n
	Date Created: 12/28/2000 1:03:5 Date Modified: 12/21/2007 12:5			055-12-8945	56	1/8/2005	Betty	Jones	909 Gervais Str		Columbia	SC	29069-4445	b
	Lookup Table for Departments			• 062-38-4992	39	1/10/2003	Space	Ghost	613 Christophe	Apt 103	New York City	NY	03849-3998	s
	tblHRInfo	Table		± 066-99-2837	25	9/1/2002	Roger	Rabbit	789 Bunny Trail		Columbus	OH	44188-	n
	Date Created: 1/2/2001 1:28:28 Date Modified: 2/27/2007 12:37:			• 072-34-0993	38	1/1/2003	Bruce	Springstung	61 Ivy Road		Atlanta	GA	30303-	b
	CONFIDENTIAL! Human Resour			± 135-71-2940	58	1/16/2005	Benjamin	Frankling	1601 Pensylvar		Atlantic City	NJ	01122-	b
	tblNewPersonnel	Table			48	12/26/2004	Dolly	Levi	157 Levi Lane		Yonkers	NY	07384-9998	d
	Date Created: 1/16/2003 10:36:1			251-15-2323	15	1/13/2001	Mark	Murphy	951 Woodlawn		Duluth	GA	30097-	n
	Date Modified: 1/16/2003 10:42 New Personnel added outside t			± 252-82-0304	49	12/26/2004	Georgia	Peach	51 Ivy Street	Suite 3200	Atlanta	GA	30303-	g
_	tblOrders	Table		± 259-38-9488	40	1/15/2003	Martin	Landing	1556 Martin Wa		Decatur	GA	30322-	n
	Date Created: 12/29/2000 2:40:5			323-12-3487	2	1/2/2001	Martha	Smith	90 Ivy Lane	Apt 1A	Decatur	GA	30123-	N
	Date Modified: 2/27/2007 12:37			323-98-5789	10	1/3/2001	Mary	Martin	1600 Peachtree		Atlanta	GA	30301-	n
_	Table for orders			⊞ 341-24-9949	61	1/30/2005	Simple	Simon	1356 Easy Stree		Atlanta	GA	30319-9444	s
	tblPersonnel	Table		348-19-2352	54	1/3/2005	Cookie	Monster	135 Sesamy Str		Atlantic City	NJ	55555-	с
	Date Created: 1/2/2001 1:17:26 Date Modified: 2/27/2007 12:37				5	1/1/2001	Newman	Howard	1358 Waverly V		Atlanta	GA	30342-	N
	Main Database Table of Associa			382-93-8472	12	1/5/2001	Sally	Smith	398 Freedom P		Atlanta	GA	30309-	S

Table – A table contains or holds the data. Tables can limit the types of data in fields and can assist in integrity and accuracy of data. Generally, tables do not perform calculations and are simply data collectors for our input or other means of acquiring data, such as tape feeds and downloading from other databases and servers. Fields comprise the records, records comprise the tables, and tables comprise the database. That's it; that's a database

Database and Relational Databases - A database can be one, stand-alone table that can contain many fields of information. This is the simplest, yet least powerful type of database and is often referred to as a "flat" database. Flat file databases do not track historical data very well. Relational databases on the other hand are many tables that are linked through common





fields and can ensure greater accuracy and less input of data. Relational databases increase flexibility of data and allow ease of collecting and maintain historical data. We will examine

Database Objects - Many Database management systems (DBMS), such as Access[®], contain objects. These objects generally are: Tables, queries, forms, and reports. These objects provide functionality and power to your database information. We will examine each of these objects in detail and other database elements using Access[®] as our database management tool. Database management systems are one stop shopping, you have your tables, queries, forms, and reports in one convenient package rather than separate applications that huge databases require. Access in not appropriate for large databases, but is terrific for small and medium size databases with limited users.

both types of databases, but we will concentrate our study on relational databases.

Relationships - Relational databases are databases in which common fields of information join tables. For example, you can have a Social Security Number as a field in two tables and retrieve information from both tables through using the Social Security Number. The relationships we will study are one-to-one and one-to-many relationships. We will overview many-to-many relationships but not concentrate on these types of relationships. Briefly, oneto-one relationships ensure that one record in one table has a (and only one) matching record in another table – generally, you should not have a Social Security Number twice in the same table nor have two SSN's in a related one-to-one table. One-to-Many relationships allow one record in one table and many records in another table. For example, in a State Table – all States are listed once and another table is linked to the State Table to have the states lookedup; thus, this "many" table can have a state listed several times. We will create, view and discuss these types of relationships in detail.

Types of Databases

Simply put a *database* is a collection of records containing fields of data. The process is: *fields* comprise *records*, *records* comprise a *table*, the *table(s)* comprise the *database*, and that is where the process can stop – with one table. More complex databases are relational databases that can have automated fields looked up from other databases or objects. Databases can be as "simple" as you like or as complex as your process, tracking, and user interface demand.

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There are two primary types of databases a stand-alone or flat database and a relational database. Stand-alone or flat databases can be created in spreadsheet, word processing, and contact management applications. These databases have one huge table that do not link to other tables and do not possess the look-up capabilities, data integrity, and other power that relational databases have. We will concentrate on relational databases.

Relational databases use field linkages to connect tables and data. This provides for ease of use, data integrity, and information accuracy.

Database Planning and Plotting

Before you begin building your database, understand the process and the data you wish to automate or to ensure accuracy. Write in detail the process that is currently used and how the altered and changed process may be more productive and timely. What automation process can replace manual operations? Two popular methods of detailing a process are flow charts and storyboarding. I like using both to help map the process and the creativity of building a database. Flow charts provide symbols for types of decisions and brief descriptions of the process. Storyboarding is a process that uses pictures, graphs, and descriptions to assist in database creation and process documentation. Either method or a combination of methods is appropriate.

As I storyboard and use flow charts for my databases and processes, I begin building the database understanding that this will not be the final product. *Access* offers great ways to document your database and assist in the planning and plotting process though descriptions. I prefer to use a combination of several process including storyboarding and flow charts with database creation in *Access* to ensure that no surprises will occur as the database approaches production and extensive testing.

Document your process and database from its inception. As soon as the digital or program database begins, so should your paper and documentation manual. Please do yourself a favor and begin your paper manual and database methods and process as soon as you begin creating your database. This will help in the future. I like to begin building my database as soon as possible with the understanding that this WILL NOT be my ultimate database – the first database is my "play" or "trial and error" database. However, I use some of the objects and other components from old databases.



There are many data gathering questions that should be addressed and that should be answered as you begin the database creation and storyboarding/flow charts. Here only a few of the questions to ask as you begin your database planning and plotting:

- ✓ What are the fields of information?
- ✓ What type of data is in the fields?
- ✓ Where is the data coming from manual input, automated tape feeds, importing?
- ✓ How many users will the system have?
- ✓ Do you have repeating information?
- ✓ What errors have occurred in a manual process that automation can help alleviate?
- ✓ What type of security is needed?

Your Important Notes 1:



Database Objects

Access, like other Database Management Systems (DBMS), includes tables, queries, forms, reports, and macros as its objects. In programming, several program languages (COBOL, Visual Basic) can be used to build tables while other program languages can be used to build queries (Structured Query Language or SQL). Database Management Systems allow for us to build databases and objects without being programmers. The objects that Access contain and that we will cover in detail in this entire (a 40 + hour course) Accessing the Possibilities course are:

- ✓ Tables,
- ✓ Queries,
- ✓ Forms,
- ✓ Reports,
- ✓ Macros.

Briefly here is a description of each object:

<u>**Tables</u>** – Tables are our data collectors and containers. They hold our data and can add intelligence to our database, such as validation rules and input masks.</u>

Queries – Queries extrapolate information based upon criteria. Queries are used for calculation fields and functions. Action queries can change, add, or delete data in tables. <u>Forms</u> – Forms are designed for viewing tables and queries on a monitor. Forms allow us to add, edit, delete, and manipulate fields. Forms can contain powerful functions and calculations. Forms can support multiple tables and queries using forms with subforms. <u>Reports</u> – Reports are designed for printing. Reports can summarize, group, and sort data for printing and viewing. Reports can contain functions and advanced operations as well. <u>Macros</u> – Macros are programmed shortcuts that allow us the create automation of many types. Macros can provide message box, analyze data, and automate navigation as well as many, many other uses.

Now, let's get to work and enjoy our process of learning Access.





Navigation Pane

With the 2007 Access DB file open, use these items as we overview using the Navigation Pane.

Our primary tool for maneuvering in our database is the *Navigation Pane*, which replaces the former Database Window in previous versions of Access. If the *Navigation Pane* does not appear when you open a database, in this case the **2007** Access DB file, you may press the *Function 11 (F11) key* on your keyboard to hide/unhide or to minimize and maximize the Navigation Pane.

Tables

Search.

Tables

Search...

Name AutoCorrect

Date Created: 6/30, Date Modified: 6/3

Date Created: 11/1

tblDeptLookup

tblContacts

A Hot Tip! You may Click the double arrows as circled at right the minimize and maximize (open/close) the Navigation Pane, too. 🛩

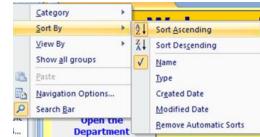
When you right click on the *Navigation Pane* Title/Shutter Bar the menu at right appears. You can view your database objects in many ways and sort them in different ways, too. I have the cascading menu for the Category item visible at right.

- 1. Click each one of these items and notice how your Navigation Pane Category changes.
- 2. Also, Sort your Navigation pane in various ways as displayed here.
- 3. Next, your View By options will help in seeing Details or a List of your database objects. The Details provide the Date Created, Date

Modified, and a Description of your Database Objects. We will use this a lot in our course and providing **Descriptions and properties for our** objects. But with List and Icon views you can see more in less space as

pictured at right and the details view is displayed above and throughout this document.





😪 🤜 Welcome! To Our Database!

Form

open the

Directory

Depa

HR Group

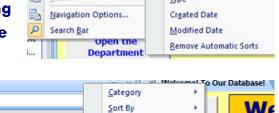
Object Type

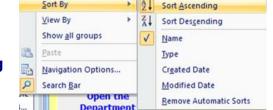
Created Date

Modified Date

Tables and Related Views

Repor









Category

Sort By

<u>V</u>iew By

Paste

Search Ba

Date Created: 11/1 Date Modified: 7/1 Main Table for Con

Date Created: 12/28/2000 1:03:54... Date Modified: 12/21/2007 12:58:... Lookup Table for Departments

Name AutoCorrect Save F

tblContacts

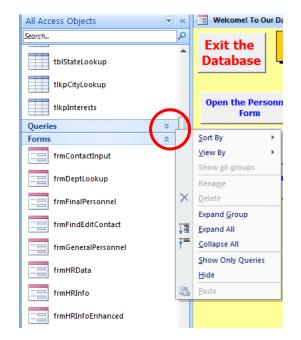
tblHRInfo

tblDeptLookup

Show all groups

When you click Show all groups as displayed here, all of your database objects appear in the Navigation Pane. You may minimize or maximize your group using the Shutter arrow. The short cut menu pictured here for your group activates when you right click on the shutter/title bar of the database object, such as Queries which is minimized here. These short cut menus will save you lots of time and frustation in using a huge database in Access.

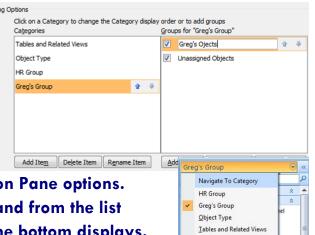
Using the Navigation Pane, change your views, your sorts, and groups.



- 1. Right Click on the Title/Shutter bar of your Navigation Pane and open the Navigation Pane Options displayed here.
- 2. From here you may create your own, new group. I have accomplished this for the HR Group. To add items to your group simply click and drag the item in the Navigation Pane

from one group to your new group.

 Create your own Group by clicking the Add Item in your Categories and Name it your first name and group. Next, add a Group to your Categories as displayed here.



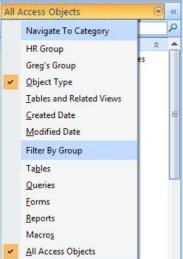
Created Date
 Modified Date
 Filter By Group
 Greg's Ojects
 Unassigned Objects
 Show All
 frmMenu
 frmMyMenu1
 frmMawUpdate
 frmPayData
 frmPersonnel

- 4. Click OK to save and close your Navigation Pane options.
- 5. Click the Navigation Pane Objects arrow and from the list Choose your group. Ensure Show All at the bottom displays.



- Find duplicates for tblPersonne
- frmDeptLookup
- frmFindEditContact frmGeneralPersonnel
- 🗐 frmHRInfo
- frmHRInfoEnhanced frmMenu

frmMeManud



Access creates a short cut to these items. I am clicking and dragging items from the Unassigned Objects to Greg's Objects.

Click the Navigation Pane's Shutter/Title bar and from the menu Click Object Type and All Access Objects. We will use this extensively in our course, but this introduces you to the new Navigation Pane.

Your Important Notes 🮜 :



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Object Wizards

Access contains Wizards for Forms, Reports, and Queries. We will build our objects from "scratch" as well as use the Wizards. While the table templates are excellent, it does not use the Leszynski Naming Conventions (LNC which we learn about later) and may not fit your custom needs. The Table Templates do provide the foundation for a table but will require you to know how to customize the tables and fields for your needs. We will build our tables without a template so that you can have full knowledge and control over your tables, no matter how they are initially constructed through a template, wizard, or not.

Database Creation 101

When you open *Access* you should see the *Getting Started window for Access 2007*. From here you can open existing databases or create new database.

Let's create our database to use throughout this course; here are the steps:

- 4. At the Getting Started pane, Click the Blank Database button.
- 5. Type in your first name and the word database as the File name as pictured at right. I am



naming mine YourDatabase and I changed the directory of where this database is stored using the folder button next to the File Name area.

- Click Create. Time to be Dr. Frankenstein and create our own monster of a database! I will refer to this database in the documentation as YourDatabase.
- 7. The Tables Tools Window appears ready to build tables.
- 8. Close your database we will overview an existing database and then begin building our tables and your tremendous database.





Using An Existing Database

Let's use our 2007 Access DB file and take a look at some of the items we will create and customize.

9. Open the 2007 Access DB database.

10. The 2007 Access DB database opens at the Welcome screen which we will construct at the end of our course. Press the F11 key to activate your Navigation Pane. Note that all tables begin with the "tbl" prefix tab and have no spaces in the names. Why?

A Hot Tip! First, I use and encourage you to employ the *Leszynski Naming Convention*. *Leszynski Naming Convention (LNC)* is a popular naming convention for database objects, fields, and other database utilities.

A consultant named Leszynski developed this naming convention and additional information is available at several websites. Please perform a search using your favorite Internet search tool on Leszynski Naming Convention –

several resources should be available. You will see the acronym LNC as well; the LNC is used by Access database administrators, developers, and Visual Basic Programmers and is very helpful in documenting your database. This naming convention has a three-character prefix and helps users and programmers understand types of objects

Tables 💿	~<	 3	Welcome! To C	Our Database!	-	tblPersonnel
Search	2		SSN	 Sales ID 	Ŧ	Hire Date
tblContacts Table		ŧ	000-00-001	1	57	1/8/20
Date Created: 11/12/2000 7:21:06 PM		Ŧ	002-20-202	2	47	12/26/20
Date Modified: 2/27/2007 12:37:19		ŧ	010-45-023	9	62	1/15/20
Main Table for Contact information		ŧ	011-88-789	9	24	10/1/2
tblDeptLookup Table		ŧ	033-05-389	4	45	12/23/2
Date Created: 12/28/2000 1:03:54 PM Date Modified: 12/21/2007 12:58:4		ŧ	055-12-894	5	56	1/8/2
Lookup Table for Departments		ŧ	062-38-499	2	39	1/10/2
tblHRInfo Table		ŧ	066-99-283	7	25	9/1/2
Date Created: 1/2/2001 1:28:28 PM		٠	072-34-099	3	38	1/1/2
Date Modified: 2/27/2007 12:37:19 CONFIDENTIAL! Human Resources		ŧ	135-71-294	0	58	1/16/2
tblNewPersonnel Table		٠	193-93-840	0	48	12/26/2
Date Created: 1/16/2003 10:36:19 AM	=	٠	251-15-232	3	15	1/13/2
Date Modified: 1/16/2003 10:42:33 New Personnel added outside the		٠	252-82-030	4	49	12/26/2
tblOrders Table		٠	259-38-948	8	40	1/15/2
Date Created: 12/29/2000 2:40:53 PM		٠	323-12-348	7	2	1/2/2
Date Modified: 2/27/2007 12:37:19		ŧ	323-98-578	9	10	1/3/2
Table for orders		ŧ	341-24-994	9	61	1/30/2
tblPersonnel Table		ŧ	348-19-235	2	54	1/3/2
Date Created: 1/2/2001 1:17:26 PM Date Modified: 5/17/2008 12:02:56		ŧ	353-28-940	2	5	1/1/2
Main Database Table of Associate		ŧ	382-93-847	2	12	

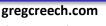
Prefix Characters	Database Objects
tbl	Table
qry	Query
frm	Form
sfrm	Sub-Form
rpt	Report
mcr	Macros

and fields at a glance. For the objects that w e will use, the naming convention is:

A Hot Tip! Second, there are no spaces in object and field names. Many database applications cannot operate properly with spaces in objects, fields, and other types of programming names.

In order to ensure that your tables and other information can be used and exported to other applications, I encourage you *not* to use spaces in object and field names. Spaces are fine for

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captions, labels, titles, and descriptions. Also, special characters may not be used in field names such as *, ?, [,]. These characters are reserved for many database applications to use for other purposes. Refer to the documentation of your programming language or database application to get a complete listing of object and field name requirements. Access help can actually help you with naming of objects and items; we will see several of the "nasty" error messages when we do not use proper naming on our Access items..

<u>Table Overview</u>

This course will concentrate on *Tables*, a lot. My philosophy is if the data is wrong in a table then none of the other objects matter. If data is not correct in a table, then no matter how powerful the query or how pretty the form and reports– the data is still wrong and may compound database inaccuracy. Tables are an important mechanism for controlling data, accuracy, and integrity and tables contain our data; therefore, we will concentrate on tables and relationships for a good part of this course. If the table is deleted, the data is deleted, too!

As stated earlier, generally a *"Flat Database"* is a stand-alone or one table; *Relational Databases* have *tables* that contain the information and can be linked through *Primary* and *Foreign Key fields.*. *A table is simply a collection of data and should serve a specific purpose*. The table contains *records*; a record is a specific data collection for an item, i.e. our database contains a record for each person. The record is composed of *fields*; a field is a specific item for the record, for example the phone number is a field, the last name is a field, etc.



What tables are:

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- ☺ Data collectors and containers
- © Field Descriptors such as Text, Number, Date/Time
- Sield Formatters through input masks such as the dashes in Social Security Numbers
- Sield Parameter setters (defaults, requirements, other parameters)
- © Mechanisms for Relationships
- © Organizers of data through simple sorting and filtering

What tables are not:

- ⊗ Number crunchers
- ⊗ Reporting mechanisms
- ⊗ Complex Sorters and Filters
- Analytical tools
- ⊗ Calculating mechanisms

Important considerations in building a database and tables:

- Databases and tables do not operate well with empty fields, if possible have some sort of default value,
- ✓ Having many tables with few fields make database changes easier and more accurate,
- Repeating data should be in lookup tables, such as state names, departments, products, services, etc.
- Normalizing is a process to ensure that repeating data is placed in lookup tables, that empty fields are avoided, and that the database is able to enforce integrity rules. This process is designed for advanced users, programmers, and database designer/administrators. Our database will be normalized and developed correctly using look-up tables, validation rules, and ensure database integrity.

Your Important Notes 🮜:

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<u>Tables with Data (Not with Legs or</u> <u>Used for Multiplication)</u>

Datasheet View and Design View



Although we are using *Access*, tables are a part of any database application. *Tables* contain data but can be placed in a "design" or programming view in order to add fields, change field types, and accomplish other powerful field requirements. In *Access* there are several views for tables. We will concentrate on two important views for tables, *Datasheet View for viewing your actual data* and *Design View for manipulating and changing fields*. Note: In all of the database objects tables, queries, forms, and reports there is a *Design View* to "program" or alter your objects and individual items and fields. We will be using the *Design View icon* to put our objects in a design or programming mode.

In the *Navigation Pane*, the *Table* objects displays all of your tables. The Table objects allows you to view the contents of a table by selecting a Table and double clicking it to put the table in datasheet view.

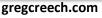
Open the tblPersonnel by double clinking tblPersonnel in the Navigation Pane.

The table opens in *datasheet view* at the *Home Tab* displaying your data. The *Datasheet View* resembles an *Excel Worksheet* with the field names across the top row and are considered Column Headers.

		T	able Tools			Our Database			
Da	atat	pase Tools	Datasheet						
ĩ	A	* 11 * 🖄 * 🌐	• E E	1		Refresh All + X De		ZI I Filter	Selection *
		Font		- G	Rich Text	Re	cords	Sort 8	k Filter
-8] v	Velcome! To Ou			tblPersonnel				
		SSN -	Sales ID	-	Hire Date 🔹	First Name 🔹	Last Name 🔹	Home Street +	Home Street +
	ŧ	000-00-0011		57	1/8/2005	Kermitt	Frogg	1 Lilly Pad Road	
	٠	002-20-2022		47	12/26/2004	Maxwell	Smart	1567 Secret Hic	Suite 30
	٠	010-45-0239		62	1/15/2005	Morticia	Addams	1358 Mockingb	
	٠	011-88-7899		24	10/1/2002	Janis	Smith	60 5th Ave	Suite 61
	٠	033-05-3894		45	12/23/2004	Marilyn	Monroe	1359 Hollywoo	Apt 3A
		055-12-8945		56	1 /8 /2005			909 Gervais Str	

The data for each field is contained in *cells*. Each *record* is *a row of information*.

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Home

Paste

Datasheet View

PivotTable View

PivotChart View

Design View

View

Create

Format

🔏 Cut 🗎 Copy

Information may be sorted *Ascending* or *Descending* by placing your cursor in a field and selecting the *Ascending* or *Descending Icon which are pictured above. Datasheet view* is a good mechanism for viewing your data, finding information, and performing simple sorts/filters. *The Datasheet view* may be printed and information may be input; however, *Reports* are the better utility for printing information and *Forms* are perfect for data input, editing, and viewing.

We will examine and work with *Datasheet View* more after we build tables and enter data.

Design View and Data Types

Click the Design View button and from the list select Design View. Access places tblPersonnel in design view.

The **Design View** of table allows powerful means of controlling the fields. In the **Design View** you can change field sizes, formatting, Validation rules, Default values etc; these are called **Field Properties**. Note the **field names**, the **data types**, and **descriptions** for each field. The **field type** is determined in this view such as text for alphanumeric fields, Date/Time types for dates, and numeric types. Note the **key** next to the **strSSN field** this is **the primary key** and may not be duplicated. You may establish **primary keys**,

which uniquely identify each record, such as Social Security Numbers in this Personnel Databases. The *key* next to this field in the *design view* signifies the *Primary key field*. You may assign a primary key by selecting the row of the field or fields you want to establish as the Primary Key(s) and clicking the *Primary*



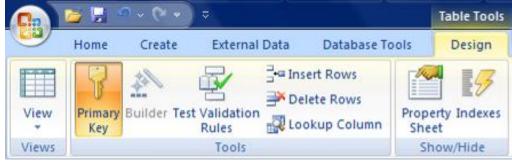
Key icon. The *Primary Key* are usually *indexed* or *sorted* by the database automatically. Database *indexing* assures that records retrieve quickly and that the information is in order.



Design View Tab - Table Tools

The *Design View Tab* in the *Table Tools*

contextual tab appears when you place your Table in Design View and contains these icons that we will use in this course –



Views for Datasheet, Primary Key, Validation Rules, Lookup Columns, Properties, and Indexes. The command buttons are pictured above.

Click on the *strSSN* field name, note the *Field Properties grid* at the bottom. This provides parameters for the field. Note the *caption* can have spaces and does not use the Leszynski Naming Convention. The *Indexed* row indicates that this field cannot have duplicates and that it is indexed. This is because this field is the *Primary Key*.

Click on the *strLastName* field, notice the *data type is text* and I have put in a description for each field. *In Access, the description appears at the bottom of the computer monitor in the status bar area when the table is in datasheet view or when using Forms to view, edit, or input data.* The *field properties* for this field display the field length to be 50 characters and that this field is required or the record cannot be input nor saved.

Data Types

The Data Types and LNC Tags are, except for numbers, currency, and Lookups,:

Data Type	Tag
Date/Time	dtm
Memo	mem
Ole	ole
Text	str
Yes/No	ysn
Hyperlink	hyp
Attachment	att



Since numbers can have multiple types of data and need more descriptions the Leszynski tags for specific types of numbers are:

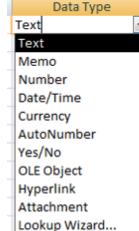
Data Type	Tag
Binary	bin
Byte	byt
AutoNumber	Ing
Currency	cur
Date/Time	dtm
Double	dbl
Integer	int
Long Integer	Ing
Single	sng

Click in the Data Types column and view the types of data. The data types and purpose are:

<u>*Text*</u> – This is used for characters, text, and numbers that are not used in calculations, such as Social Security Numbers and ZIP Codes, or where leading zeros are needed. 255 is the field size limit for Text

Number – Data, except monetary data, that will be used in calculations and are numeric or digits, such as a quantity field.

Currency – Monetary or financial numbers. Multiple formats are available for displaying types of currency.



tblPersonnel

Date/Time – Data that is a date and/or time value. Various date and time formats are available such as short date. An Important Note: J Formatting date fields as Date/Time and not as text or number is very important in order for the tables, queries, and other utilities to work properly in sorting, filter, and extracting date information. 🥒

Yes/No – Yes or No, True or False type of data – data can only be expressed in one of two choices. A check box is provided to select yes with a check or to leave blank for a no. You may also perform calculations and used functions based on Yes/No values.



<u>Memo</u> – For lengthy fields of information such as descriptions, notes, comments, etc. use the memo type. **Another Important Note** *A* **Memo Fields can store up to 65,536 characters!**

<u>AutoNumber</u> – Continuous numbers assigned by Access automatically. If you delete a record with an AutoNumber field, Access **will not** reuse that number.

<u>OLE Object</u> – Object Linking and Embedding object created in another application but used in Access such as jpg files.

Hyperlink – Allows you to format and edit hyperlink data quickly and easily. If you use this for hyperlinks and are connected to the Internet, clicking this will open the hyperlink of a web page. Hyperlinks can also be used as bookmarks for files within your database or server/PC.

NEW for 2007! <u>Attachments</u> – Allows you to insert files from other applications in Access. You may insert multiple files into one record and have a variety of file types, such as Word and Excel.

Lookup Wizard – This is an Access wizard that allows you to lookup data for input from another table. Although the strDeptCode field appears to be a Text field, it is in fact a lookup field from the tblDeptLookup table.

The *field properties* section is where we may provide *default values* and *validation rules*, such as data that must be within a certain range. Although we are viewing Access for this information, other database programs and applications contain similar Data Types and information.

Click view button and click the atasheet view. Close the table – tblPersonnel.



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Relationships: Overview

Relationships in databases, like human relationships, can be very complicated! Relationships are a part of all databases, including Access, SQL, etc. We will overview some of the more common relationships that databases can have. We will be working with relationships throughout our course and time together. We will overview relationships here and will create and change relationships as we build tables and work with queries. Don't worry that this may be overwhelming as you begin learning about Databases – we'll be developing and building our relationships as we construct our tables.

There are three types of relationships that databases can have to connect tables.

One-to-One Relationships – For every record in one table there is a matching record in another table. An example of this is a Human Resources table of employee data that lists general information about employees; the Social Security Number could be the *primary key*. Another Payroll table is linked to the Human Resources table through the Social Security Number or primary key. This is important so that a SSN is input correctly and consistently and the user selects the information from a list. These two tables cannot contain two records with the same SSN. In our database, the tblPersonnel and tblHRInfo have a one-to-one *relationship*. The tblPersonnel tracks demographic and basic information about people; the tblHRInfo provides pay information, hours, and ratings. In Access the *Relationships* Window displays the One-to-One Relationship between tblPersonnel and tblHRInfo. A record cannot be input in tblHRInfo until person exists in the tblPersonnel. As you develop your database give careful thought to the process of the data. One of the first questions to ask is: What table and data are needed first? Once you decide the logical process of data then construct relationships to assist the data accuracy of your process. I have decided that the tblPersonnel table is my main database table and people must be input here first before they can be used in other tables or parts of the database.

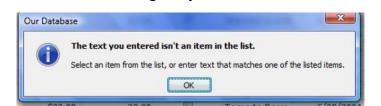
Important Note \mathcal{A} : Only one relationship may exist between the same tables. A table cannot connect to another table twice. The fields used as the key fields must be the same data type and size. You can have a table with multiple relationships but to other tables. We will accomplish this as we construct our tables. \mathcal{A}

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Let's examine our one-to-one relationship in the 2007 Access DB file.

- 1. Have the 2007 Access DB file open.
- 2. In the Navigation Pane view the Tables objects, double click the tblHRInfo table.
- 3. The table opens in datasheet view.
- 4. Click the New button as displayed at right.
- 5. In the first field, the caption reads Select Name.
- 6. Input a name that is not on the list and Access will give you an error message as displayed above alerting you that you must select an item from the list.
- 7. Press the ESC key twice to cancel your input.



OK Help

New

8. Next, Select Ghost Space from your list and enter information (If you input information that is not acceptable, such as inputting a pay rate less than \$5, Access will provide a message to guide you to input the correct value - we will learn this, too.)

The changes you requested to the table were not s Change the data in the field or fields that contain du

9. After you enter the correct information and attempt to move to another new record or save this Our Database

record Access provides the message box advising you

that this would produce a duplicate record.

- 10. Press the ESC key twice to cancel your input.
- 11. Our one-to-one relationships are working.
- 12. Close the tblHRInfo

One-to-Many Relationships - **One-to-Many relationships** exists when one field in one table appears many times in another field or table. Our database contains a one-tomany relationship between the tlkpStateLookup table and the tblPersonnel. In this example, the tlkpStateLookup table contains the states and other regions – a state can only be in the table once and the two digit state abbreviation (strST field) is the primary key thus preventing duplication. The tblPersonnel can have people in duplicating or many states, so this is the many part of the relationship. The field strST acts a lookup field and a relationship field. The one-to-many relationship displays with a 1 on the one side of the relationship and the

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infinity symbol on the many side of the relationship. With the creation of this relationship, the relationship allows us to update records or delete records automatically. For example, if I

change GA to GR in the tlkpStateLookup the records that contain GA in the tblPersonnel will automatically change. This is particularly helpful for major updates, such as department codes, pricing or product descriptions.

Let's see this in action and take note of our powerful relationships.

- 1. Open the tblPersonnel by double clicking tblPersonnel in the Tables Objects of the Navigation Pane.
- 2. Click in a record and tab to and notice the Home State field.
- A list box provides a way for you to choose the state this lookup list is coming from tlkpStateLookup. Notice all of the states with GA – this is the many side of our relationship. We have many people from GA in this table.
- 4. Double click tlkpStateLookup and the table will open in Datasheet View.
- 5. Scroll down and change GA to GR.
- 6. Close tlkpStateLookup by clicking the small II x or right clicking the tab and choosing Close from your menu. Access will save your data automatically!
- 7. Click back on your tblPersonnel Tab.
- Scroll to the Home State field and notice all of the changes to GR! This is part of our relationships – the ability to automatically update fields. Wow!
- 9. Re-open tlkpStateLookup and change GR back to GA.
- 10. Close the tlkpStateLookup.
- 11. Click back on your tblPersonnel and notice that GR is changed back to GA.

<u>Many-to-Many Relationships</u> – Many to Many relationships are tables that usually require a junction table to bring the two tables together. Fields are mapped to bring commonality to these tables. In essence, you create two one-to-many relationships. We will discuss these later.

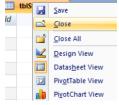
GA	Georgia	۱m	
HI	Hawaii	js	
IA	Iowa	m	
ID	Idaho	b	
IL	Illinois	S	
IN	Indiana	r	
KS	Kansas 👻	h	
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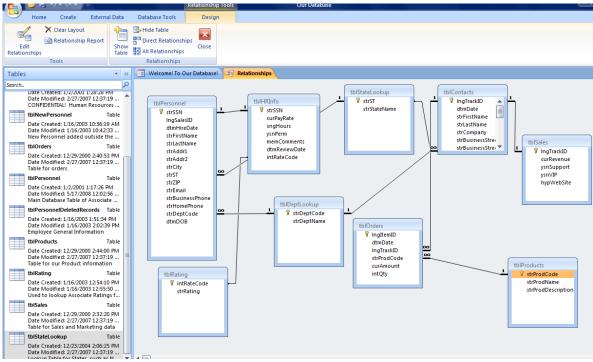


With all of your tables closed, Click the Database Tools tab and then Click the Relationships Command button.

 Access opens your Relationships Tab displaying your relationships. This looks very complicated, now, but we'll make sense of this as we construct our own relationships. A picture of my Relationships Tab displays below. The Design tab for Relationships appears, too.

Database Tool:	
Relationships	Property Sheet
	Show/Hide
related, suc	r the data in tables is h as ID fields or name ferent tables that

- 2. You can see the 1 symbol and the infinity symbols connecting the tables through certain key fields – these are one-to-many relationship. There are also 1 to 1 relationships.
- 3. We will use this throughout our course as we build tables and manipulate data through queries and joins.
- 4. Close the relationships window. If you are prompted to save it, please do so.



Time to put on your data geek hat and build our database!





<u>Primary Keys</u>

Primary Keys are important to databases as they link our tables and information together. Access 2007 assumes that you want to use AutoNumber as a Primary Key. While AutoNumber is a popular and easy field to use as a Primary key, it is not the only type of field to use and you must have a mechanism of checking for unwanted duplicates using an AutoNumber as a Primary key. The tlkpStateLookup is a good example – this table with AutoNumber as an ID allows us to create more than one state code when we only need one state listed once in this table. We will delete the AutoNumber field and create our own Primary key for tlkpStateLookup. Here's the importance of Primary Keys:

What do Primary Keys accomplish?

- The Primary Key fields are required and must have data in them; therefore, they cannot be empty.
- ✓ The Primary Key field acts as the major sort field for the table; this is termed – Index – (in Database jargon) and we will examine indexing and sorting later.
- ✓ The Primary Key ensures no duplication no record can have the same value in this field.

Other Important Notes for Primary Keys and Tables *A*:

You may assign more than one field as *Primary Key(s)*. Pressing the *Control Key* and selecting the rows/fields you want to assign as *Primary Keys*. If you have existing *Primary Keys*, You will need to select the *Primary Key* row and click the *Primary Key* icon to remove the *Primary key* then you can add your new *Primary Keys*.





<u>Forms</u>

Overview and Purpose

Forms are a method of inputting data, editing data, and viewing data. Forms are designed for the monitor and viewing data. Although forms may be printed, they are not designed for printing as much as reports. Forms can be based on Tables or Queries. The input is stored in the table(s) that is based upon the form architecture. Forms can be very complex as they can display information from several tables via sub-forms. Forms can restrict input, be read-only, or allow only certain information for display and updating. Calculations, functions, and advanced expressions may be coded into forms. Forms can be very simple, too. Forms help users view data and are popular on the Internet and ordering information on the World Wide Web using a database form. We would not want to order products or services without forms – trust me! Forms sure beat inputting and editing data in tables and queries; our eyes appreciate forms. Forms add functionality, ease of use, and automation. You may delete forms without deleting information in a table – Remember tables are our data containers.

Forms are used to build menus and navigation screens. Another popular use of forms is for menus, navigation, and "splash" screens. In this use of forms, forms are not tied to data in tables and queries. Menus and navigation screens often contain buttons or hyperlinks to other areas of the database and objects.





We will look at several types of forms and discuss their functionality. We will use **2007 Access DB** to view these forms.

Menu Forms

When you Open the **2007** Access DB file. A menu appears for you to click buttons. Press the **F11** Key to view the **Navigation Pane**. Trace to your **Form** objects and select **frmMenuForm1**. This is the form you are viewing. This form contains buttons that you may click to navigate to various parts of your database. These types of forms make maneuvering around a database organized and "user friendly". **Click on each button** to view the various database objects that you may open. After you click and view the object, then close the object. The Report will prompt you for dates and a department – enter dates as 01/01/2000 and 12/31/2008 and click OK for the Departments.

Generally, menu forms are not tied to tables or queries and contain no data; therefore, they do not impact data or tables. Access uses the term "*Switchboard*" for a menu type of form and contains a powerful *Switchboard Manager* program and wizard for developing a navigation menu or "switchboard." Forms are programmed using programming languages (Access uses a version of Visual Basic programming language for forms and reports.) These forms simply make life easier and our databases more organized. We will build our own customized Menu at the end of our course.

View Only or Read Only Forms

Next, Open the form *frmMenu* in the 2007 Access DB file. Using our *frmMenu* form or the Menu Form, Click the View Employee Data button.

This form is view or read only. Try changing data and try adding or deleting a record. The form allows you to move from field to field by Pressing your tab key but no changes may be made.

This form is based on the table tblPersonnel. All of the fields from the table are included on this form, EXCEPT the Social Security Number field. Since all associates may view this form, the SSN field has been omitted for confidentiality reasons. The records are sorted alphabetically for this form. You could perform searches, filters, and perform other functions using this form





layout. Click the Close this Form button. You return to the Main Menu – we will learn how to this later in our time together.

Multi-Table and Forms based upon Queries

Using the *frmMenu* or the Menu Form, click the View Payroll Data button. This opens the *frmPayData* with is based on the *qryPayData*. While this form appears simple, it is based upon a query, which has three linked tables to produce these results, and the query contains the calculations for the Weekly and Annual Pay. This form is read only because of the confidential nature of the information and because this form does not have all of the fields associated with the tables. Therefore, inputting new records could not be accomplished using this form because not all fields in the table could be input or updated. *Close the form*.

Search and Edit Forms

Using the *frmMenu* form, click the *Find and Edit A Contact* button. Notice the *first field* at the top of the form "Choose a Contact Name:" – your cursor should be in this box ready for you to type a namer or ssing the drop down box select a name and click – Type Que and Suzie Que's information displays. The drop down box provides the user with the Last Name, First Name, and Company name sorted alphabetically by Last Name to assist in selecting the correct contact. Once you select a name and click it, the information for that person displays. Since this form is used only to edit existing contacts, new contacts may not be added nor exiting contacts deleted. Change information on a record. As you move from field to field making changes, Access automatically saves the information for you. This form is based on tblContacts. Close the form.

Input Forms

Using the *frmMenu* form, click the *Input A New Employee button*. The *Personnel Input Form* opens.

Notice the form opens at the SSN ready for input and that all of the fields are blank. This form does not allow the user to see any existing records. Notice that the state fields and hire date take the characteristics of the table, such as the drop down box for State and the default values for Hire Date. While forms can have the attributes of tables including validation rules and

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default values, there are times that you would not want tables to contain restrictions (when importing data for example); therefore, you can "program" or edit the form to limit data types and ranges for integrity and accuracy just like the table could.

This form is really two forms and follows the process of a record needing to be in the tblPersonnel first and then a record can be added to tblHRData; therefore, this form adds records to two tables and ensures integrity by not allowing duplicate SSNs to be input. *In the SSN field type 999-99-9999, tab to the Last Name field and type John, tab through all of the fields until you get to the error message that the field is a duplicate. Press the ESC key to clear the input.* Also, notice that when you input 999-99-9999 the information in the H R Data Input populated since the 999-99-9999 SSN already existed. *Now, input a record using your imagination to populate each field with data and notice that the Card field automatically populates based upon the Hire Date.* This field is used to send an anniversary card to associates 10 days after their hire date anniversary. This is a function in the form field. Also, notice that after typing a birth date, the form provides the age – this is a function we will learn and apply to a form similar to this.

As stated earlier, forms are a mechanism to add, edit, delete, and view data in tables. This form can be deleted and the records remain intact in the tables. However, forms can also contain functions that populate automatically and do not feed data to a table or query if this type of form were to be deleted the functions and data would disappear. Our *Age* and *Card field* are such expressions; these "fields" or expressions are a function built into the form. If the form goes away so does this data. *Close the form.*

As with other Access Objects, Forms have several views, but the there are two important views in Forms we will use a lot. These *two views are: Form View* for viewing your data using the form and *Design View* for modifying your forms appearance, functionality, fields, and much more.

Notes formats and Design View: You can easily change the format of a form in design view. In the design view select *AutoFormat* from the *Arrange Tab* and predefined formats will appear for you to select. *Forms* contain labels and fields. The label describes the input field and can be the same name as the field name.



In *Form View*, you can sort data and establish filters to view your information as you can in a query or table; however, the information will be presented in a fancy form view, not a plain datasheet view. You can find specific records based upon specific criteria. Aside from the attractive nature of forms, forms can ensure great data input accuracy and efficiency. *Forms* have controls that can restrict input and make input easy. To accomplish this, *Forms use Option Boxes, List Boxes, Check boxes, combo boxes, and a host of other controls in its Toolbox.* Default values can be assigned and input masks (just like tables) can make input consistent. *Forms* can contain *expressions* and *calculations,* like the age function, although calculations are great in queries and reports, too.

There are *Dialogue Forms*, too, that offer the end user choices and criteria for reports and other forms. You can customize *Dialogue Boxes* and *Message boxes* using forms, too.

Your Important Notes 🮜:





Form and Form Wizard

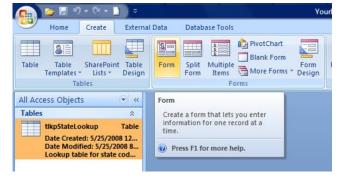
Basic Form

Inputting and editing information using the *Datasheet* view is functional but not pretty. Let's begin our study of *forms* by using the *Form* and the *Form Wizard* to input, edit, and view our state information. For a simple table, like *tlkpStateLookup*, using the *Datasheet View* is probably preferred, since there are only two fields and a finite number of states.

Here are the steps for producing a quick and easy form based upon a selected table or query.

- In the Table Objects section of the Navigation Pane, select your tlkpStateLookup,
- 2. Click the Create Tab,
- 3. Click Form button.

Access quickly produces a simple form for you to view your table



information and to input and to edit data. Throughout our course we will build several forms and look at all of the types of forms.

The *Form Layout Tools* offers two new tabs for Forms - *Format* and *Arrange*; the *Format* Tab for tlkpStateLookup is displayed below. We will use this tab and format our form and add functionality to the form in *Design View*.

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Home Create External Data Database Tools	Format Arrange
Calibri 11	ormatting If the Line Thickness * S %) 100 201 Findines 2 Color * S %) 100 201 S Date and Time 2 Line Color *
Views Font	Formatting Gridlines Controls AutoFormat
All Access Objects 💿 « 📑 tlkpStateLookup	×
Date Created: 5/25/2008 12: Date Modified: 5/25/2008 8:	tateLookup
State: AL	
State Name: Alab	ama

An Important Note: Notice that AL is the first state. Why is that when we input GA first? Answer: Because we made the strST field our primary key and

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Access will index (or sort) by this field by default unless we change the order using our sort command buttons. J

Please type in a few more state abbreviations and names. Also, attempt to input the same state abbreviation twice - we should not be able to input the same state code twice due to our Primary Key not allowing duplicates.

Also, notice that the status bar contains the descriptions from our Table's design view.

- 1. Click the Save icon and save the form as frmPlainStateForm.
- 2. Right Click on the Form in the Navigation Pane and trace to and click View Properties.
- 3. From the Properties box type in a description. I have entered Plain Form tied to tlkpStateLookup.
- 4. Click OK.
- 5. Close the form by Right Clicking on the tab and from the short cut menu, as displayed at right, click Close.

A Hot Tip! Right clicking on an Access obect's tab produces a

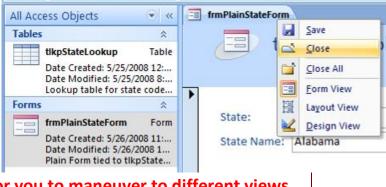
productive short cut menu. This

shortcut menu is a quick and easy way for you to maneuver to different views, save, and close your Access objects. *F*



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frmPlainStateF	Form Properties	×
General		
	frmPlainStateForm	
Type:	Form	
Description:	Plain Form tied to tlkpStateLookup	
Created: 5	/26/2008 11:03:06 AM	_
	/26/2008 11:03:06 AM	
Owner: A		
Attributes:	E Hidden	
	OK Cancel App	oly



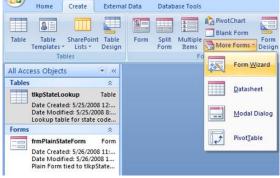
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Form Wizard

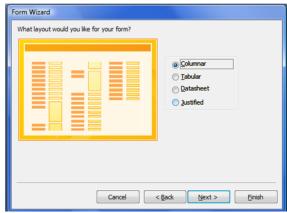
Let's use the Form Wizard to create a "prettier" form for our view and input into the tlkpStateLookup. We will construct several forms using the wizard and others not using the wizard. Home Create External Data

Here are the steps for building a Form Using the Form Wizard.

- 1. Select your tlkpStateLookup Table.
- 2. Click the Create Tab and click the More Forms button and from the cascading menu, Click Form Wizard.
- 3. The Form Wizard activates.
- 4. The Available Fields box lists our fields. Send both of the fields to the Selected Fields box by clicking the Double Arrow pointing to the right (>>) and toward the Selected Fields box. (The Single Arrow pointing to the right sends the highlighted fields one by one to the Selected Fields box. So You may double click the field name in the Available Field box and that will send the field over to the Selected Field box, too. ♬ Since we are inputting data into a table, using all of the fields is critical so we don't erroneously leave fields blank in a record.
- 5. Click Next.
- 6. Choose Columnar layout. Columnar layout offers one record per screen. Tabular offers multiple records per screen. Justified places the labels/captions about the fields in a row fashion. We have worked in Datasheet layout







already. We will work with all of these layouts so you may determine which is the best layout for your data.

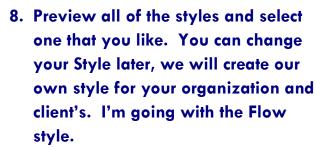
7. Click Next.

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Form Wiz



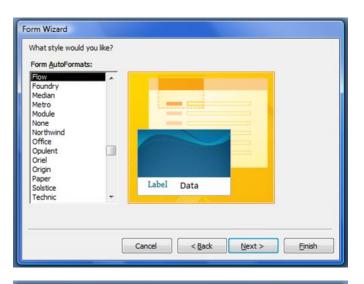


- 9. Click Next.
- 10. Title your form frmStateLookup.
- 11. Click Finish.

Access creates a "prettier" form for you. We will use the *Form Wizard* several times through this course. Except for Menu or Navigation forms, I always use the *Form Wizard* for my input and viewing forms and modify the forms for my database needs.

Finally, Right Click on your Form in the Navigation Pane and Trace to View Properties and Click. Enter a description for your form – I have entered Input and Edit Form for tlkpStateLookup. Click OK.

Your Important Notes 🮜:



	What title do you want for your form?
	frmötateLookup
	That's all the information the wizard needs to create your form. Do you want to open the form or modify the form's design? © Qpen the form to view or enter information. © Modify the form's design.
	Cancel < <u>B</u> ack <u>N</u> ext > <u>Finish</u>
out	frmStateLookup Properties
	General fmStateLookup Type: Form Description: Trout and Edit Form for tikeStateLookup
	Description: Input and Edit Form for tkpStateLookup
	Created: 5/26/2008 11:27:15 AM



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<u>Queries: Questions and Answers with lots</u> <u>of Expression</u>

<u>Query Overview</u>

Now that we have data in tables, we want to manipulate, extract, and view certain data. That is one of the purposes of queries in database applications. We will create all kinds of *queries* that are listed below as examples and to provide an overview of queries as we prepare to learn all about queries.

Queries are database organizers and manipulators; queries can extract information based upon criteria. We perform calculations in queries using fields and impact data in tables through *Action Queries*. *Queries* allow very *complex filtering*, *sorting*, and number crunching. *Mathematical operations* are performed in *Queries* using *Expressions and Operators*, such as *, +, <. >, =. If you wanted to summarize numbers for total information, queries perform those operations. If you want to design a tax field based upon the price of an item, the query design screen performs this task.

Criteria can be set to restrict information, such as showing your address database for people born before 1999 and after 1970. You can query on everyone whose Last Name begins with B. We save queries for re-use and they can be the basis for forms and reports. *Queries* can automatically update tables. That's right I wrote: TableS (plural). One of the powers of queries is its ability to manipulate data from many tables and produce results from very differing table data through *relationships, joins*, and the *primary keys*. The information is gathered based upon the query and saved. The output is not very attractive in *datasheet view*; therefore, Access can base *Reports and Forms* on *Queries*. *As we will learn, reports and forms can add to the functionality to the data in tables and queries*.

Queries can be very complex and are programmed using various languages, including *Structured Query Language (SQL)*. In Access, all queries are translated into *SQL*, and the *SQL* can be viewed using the *View button in Query Design* for all queries. *Structured Query Language* is a popular querying program and very powerful; however, there are others.





A Note on Formats: In the Datasheet View for Tables and Queries, you can format your information using the formatting buttons on the Home tab as we have accomplished for out tables. Formatting applies to the Datasheet View only, not the actual field data formatting. Formats apply to the entire table or query datasheet view, not to specific cells, rows, or columns. *Reports* and *Forms* are best for formatting and appearances; *Reports* for printed Output and *Forms* for Viewing, Editing, and Input of records.

Queries change, add, and delete data (Action Queries). Aside from select queries and calculation fields, *Action Queries* can change, add, and delete data. Always test your action queries before using them on a live or actual data restoring the original data can be difficult, if not impossible. Here are some of the type of action queries and examples of how I use them.

Action queries can delete specific records based upon criteria. For example, I archive data from year to year using an Append or Make Table query, and then I delete data for my active tables for the previous year. A delete query removes records from my active table based upon the year I enter.

Action queries can update data. For example, when I have a price change on a specific item. I develop a select query for the items whose I price I want to change, and then I update the price field to reflect a calculation to increase the price or decrease the price through using percentages.

Action queries can add data. For example, I use the Append Query in Access to add records from data I import into a new table; I then take the new table and through the Append query add data to my existing and main table.

Action queries can build tables. For example, I have complex queries that involve many calculations and I want to make the query into a table. Access has **a Make Table** action query.



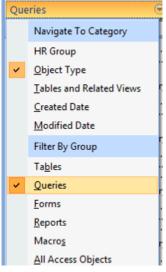


<u>Query Examples</u>

We will examine several types of queries and discuss the results. Like other objects in databases, queries have a design or edit view and a datasheet view.

Let's review some of the queries provided for you in the 2007 Access DB database.

- 1. In the 2007 Access DB database click the Navigation Pane **Objects list and choose Query**.
- 2. In your query list select qryName. (Note I am using the Leszynski Naming Convention for my queries, so they begin with gry.)
- 3. Double click gryName to open the guery. A dialogue box opens requesting the State's Code. Type "g" – lower or upper case does not matter. The query results show our customers in GA.



4. Click the Design icon.

Pictured below is the Access query in design view.

Notice the *Criteria row* for specifying your information. The *criteria* in this query is only for

State Code, and we are prompted to input the state. I have included the coding in the criteria row for you. This type of select query is called a parameter query; this is a very popular type of query for "ad hoc" or "on the fly" reports. We will learn how to

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		dtm strF strL strA strC strS strZ strZ	SN SalesID HirieDa irstNam ddr1 ddr2 ity T IP						
_		strE strF							
		 strE ctrF							•
Field:	strFirstName	strLastName	strAddr1	strAddr2	strCity	strST	strZIP	strHomePhone	
Field: Table:		 strLastName tbIPersonnel	lucines:			strST tblPersonnel	strZIP tblPersonnel	strHomePhone tbiPersonnel	strDept tblPerse
Field: Table: Sort:	tblPersonnel	 strLastName tbIPersonnel Ascending	strAddr1 tbiPersonnel	strAddr2 tbiPersonnel	strCity tbIPersonnel	tblPersonnel	tblPersonnel	tblPersonnel	
Field: Table:	tblPersonnel	 strLastName tbIPersonnel	strAddr1	strAddr2	strCity		tblPersonnel		

create and run several of these types of queries. Often reports that we generate are tied to **EFAM 2013** www.iaap-hq.org

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queries for the data selection and calculations, and the queries are based on tables to retrieve the data.

- 1. Click the Datasheet View Icon.
- 2. When you are prompted for a state abbreviation, Type "n". Notice your results include NY, NC, and NJ.
- 3. Press the Shift Key and the F9 simultaneously this is an Access shortcut to rerun a parameter query while in datasheet view.
- 4. At the state abbreviation prompt type "tn; only our customers in Tennessee display.
- 5. Click the close button to exit this query.

Let's examine a query that contains several calculations and will prompt you for department and dates

- 1. In the 2007 Access DB database and in the query section of the Navigation Pane double click the qryMyPayReport query.
- 2. At the First Date prompt type 01/01/2001,
- 3. Press the Enter Key or Click OK button,
- 4. At the Second Date prompt type 12/31/01,
- 5. Press the Enter Key or Click OK button.
- 6. We only want people hired in 2001.
- 7. At the prompt for Department Code Click OK to view all Departments,
- 8. This query displays the associates, the weekly payroll, and annual payroll.
- 9. Click the Design button.

Pictured below and visible on your screen is the query that includes the following:

- Concatenating (Bringing together) two fields to create one expression - the Name
- \checkmark Parameter for Hire dates,
- Parameter for Department,
- Calculation for Weekly Totals by multiplying curPayRate by sngHours,
- Calculation for Annual Pay using the Weekly Pay expression,



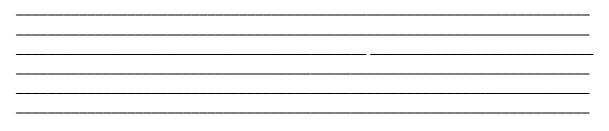


 Details of Associates from various tables and using the field Department Name, Proof that relationships (one-toone and one-to-many) are vital to retrieve this type of data.

We will create several types of queries including the one displayed below. We will base our reports on the queries we create in our next section.

tblDeptLook * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * </th <th>gryName</th> <th>e 📑 qryOrders</th> <th>gryMyPayRepor</th> <th>t</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>×</th>	gryName	e 📑 qryOrders	gryMyPayRepor	t						×
Field: Name: [strFirstName] & ** & [strLastName] dtmHireDate tblPersonnel strDeptCode tblDeptLokup strDeptName tblDeptLokup curPayRate tblDeptLokup sngHours tblHRInfo WeaklyPay: [curPayRate]*[sngHours] Annu Annu Sort:	* ¥ strE	Look DeptCc	* strSSN IngSalesID dtmHireDate strFirstName strAddr1 strAddr2 strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strCity strEin strBusines StrDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDiscont strDis	1 1 ♥ strSSN sngHou ysnPerm memCor dtRæver intRateC ♥						
Table: tblPersonnel tblDeptLookup tblDeptLookup tblHRInfo tblHRInfo Sort: Image: Contract of the second date: Image: Contract of the second date:<										
Sort: Image: Control of the section		Name: [strFirstNam	e] & " " & [strLastName]						WeaklyPay: [curPayRate]*[sngHours]	Annu
Show: Image: Criteria:				tblPersonnel	tblDeptLookup	tblDeptLookup	tbIHRInfo	tblHRInfo		
Criteria: Between [Please enter First Date:] And [Please enter Second date:] Like [Please enter the										
			\checkmark				V	v		
				between (Please enter First Date:) And (Please enter Second date:)	Like (Please enter the					
	01.									

Your Important Notes A:







Due to the number of records in **2007** Access DB we will use this database for our education on queries; however, I encourage you to add records to your database tables and perform similar gueries that you will learn here.

We will create a Directory query of associate addresses and then base a report on this query.

- 1. In the Queries Objects section of the Navigation Pane,
- 2. Double Click the "Create Query in Design View" Icon.
- 3. The Show Table Dialogue Box is displayed.

A Note the Show Tables Dialogue Box and the Show Table Icon on the Query Design Toolbar appear and work the same as in the Relationships Windo

- 4. Select the tblPersonnel,
- 5. Click the Add button or you may double click tblPersonnel and it will add automatically.

A Hot Tip! You may add more than one table to your grid at a time selecting multiple tables using the CTRL + Click method (for tables that are not continuous) or the SHIFT + Click method (for table that are continuous).

6. Close the Show Table Dialogue box.

OW.	choose tables or queries to add to the query design.
Show Table	? ×
Tables Queries Both tblContacts tblDeptLookup tblHRInfo tblNewPersonnel tblOrders tblPersonnel tblPersonnelDeletedRect tblProducts tblRating tblSateLookup tblStateLookup tlkpInterests	ords
	Add Close





Design view The Show Table dialog box is

Query Query Wizard Design

Other

Query Macro

New Object: Query Create a new, blank query in



Home Run sults	•		Database To					
Run	Select Make			0 Union				
sults			Crosstab D	Pass-Through	Show De		columns	s Table Names
_		Q	uery Type			Query Setup		Show/Hide
Query	y1							
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Table Sort Show Criteria	e: t: v:							
	Tabl Sor Shov Criteri	strBusinessF strHomePho strDeptCode dtmDOB	strBusinessPhone strHomePhone strDeptCode dtmDOB Field: Table: Sort: Show: Criteria:	Field: Sort: Show: Criteria:	strBusinessPhone strHomePhone strDeptCode dtmDOB Field: Field: Sort: Sort: Show: Criteria:	strBusinessPhone strHomePhone strDeptCode dtmDOB	strBusinessPhone strIomePhone strDeptCode dtmDOB	strBusinessPhone strIomePhone strDeptCode dtmDOB

Your query screen should look similar to the one below.

The Query Tools Design Tab and Important Buttons

We will use the buttons pictured above throughout our query learning. We have used the *Views button* on other objects and will use this to view our results in *datasheet view* and our query grid in *Design view*. We will use the *Show Table button* (as we previewed in the *Relationships window*) to add tables to our view.

In order to view data and "run" queries, we must first select fields from the table and place them in the query grid in the bottom portion of our screen.





Here are the methods of selecting fields from the table boxes and adding them to our query grid:

- ✓ Double Click the field in the table box and the field appears on your query grid,
- Click and drag the field from the table box to the query grid,
- ✓ In the Field row on the query grid use the drop down arrow to select the table and field (this is pictured at right)

To add <u>all</u> of the fields from a table to the grid:

- Double click the table box's title bar, all fields are selected, Click and drag them to the grid, you will see all of the fields added to the grid,
- Drag the asterisk in the table box to the grid, the fields will not display on the grid, but when you run the query all of the fields will be displayed (I do not like this, because I like to see what I get. I am a WISIWIG (What I See Is What I Get) person especially with a lot of fields and in performing criteria on them. But, this is helpful to use all of the fields for a form or report based on this query.)

We will use all of these methods in course.

A The table boxes and query columns may be enlarged or decreased by placing your cursor on the borders of the tables or between the columns in the grid, a double arrow will appear for you to click and drag. You may AutoFit or Best Fit your query columns by double clicking between the columns. I have also increased the space between my grid and the table area using the bar separating them and then clicking a dragging the resizing arrow down. ♪

Let's practice adding all of the fields to your grid and viewing the results.

4	tbiPersonnel.* strSSN IngSalesID dtmHireDate StrIastName strAddr1 strAddr2 strCity strST strCity strST strZIP strEmail strBusinessPhone strHomePhone strDeptCode dtmDOB
Field: Table: Sort: Show: Criteria: or:	



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- 1. Double click the asterisk at the top of your tblPersonnel as displayed at right. Access puts the necessary coding in the grid.
- 2. Click your View button and go to Datasheet View.
- 3. Notice your Datasheet view is the same in Query as in Table with Filtering, Sorting, and formatting buttons.
- Also, the data is sorted by the Primary Key SSN just as in our table.
- 5. Click the Design View button to return to Design view.
- 6. Select your column by placing your cursor above the column on the bar and with the small down arrow displaying click and the column is selected. Press delete on your keyboard to delete the column.
- 1. Next, with your grid empty. Double click the title bar of tblPersonnel circled at right. This selects all of your fields. Click and drag any field to the grid and they all appear on the grid.
- Click your view button and view your results in Datasheet view

 the data and the view is the same as the previous query.
- 3. Click the Design View button and select your columns by getting the selection arrow and clicking and dragging across your columns to select them all and press delete to remove the columns.



- 1. From the tblPersonnel table box,
- 2. Double click the field strFirstName and the field is place on your grid,
- 3. Next click the strLastName field and drag it to your grid,
- 4. Next using the Drop down arrow in the third (3rd) column in the field row, select strAddr1 in the pick list. If you need to add a column to select this field, click the Insert Columns button in the Set up Query Group.
- 5. Add the field strAddr2 from your table box to the query grid using one of the three methods above (click and drag, double click, or use the drop down list in the field row.



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tblPersonnel

strSSN

IngSalesID dtmHireDate strFirstName

strLastName strAddr1 strAddr2

strCity strST

strZIP strEmail strBusinessPhone

strHomePhon strDeptCode

dtmDOB





No Distribution or Duplication Exclusive for IAAP and Techedutainment Services. Now, let's add multiple fields at once - I like selecting the fields in the table box and then clicking one of the fields and dragging all of the selected fields to the grid. tblPersonnel

- 1. Click the strCity field,
- 2. Press your Shift key and keep it pressed,
- 3. Click the strZIP field and Access selects strCity field through strZIP.
- 4. Release your shift key.
- 5. Press the CTRL key and keep it pressed,
- 6. Click the strHomePhone field,
- 7. Click the strDeptCode field.
- 8. Now, click one of the SELECTED fields and drag it to your grid.
- 9. Viola! Your selected fields should appear on your grid as displayed below.

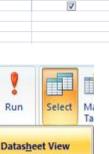
		,			1	1			
Field:	strFirstName	strLastName	strAddr1	strAddr2	strCity	strST	strZIP	strHomePhone	strDeptCode
Table:	tblPersonnel								
Sort:									
Show:	V	1	V						
Criteria:									
or:									
	1								

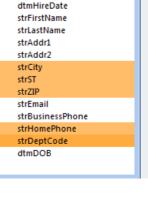
10. Click the Red Exclamation Point (Run) button or Click the Datasheet View button to "run" and view the query. We can use either of these buttons for our Select Queries; Action Queries require you to press the Run button in order to perform the Action on your data.

Note & Since we have not input any criteria, the data is the same as if we viewed this in the Table's Datasheet view, EXCEPT only the fields we select in the query grid are showing - not all of the fields that would appear in the Table's Datasheet view A.



11. Click the Design View icon.





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🖁 strSSN IngSalesID



Now let's enter a sort and criteria. We'll also cover some very important notes and tips on queries.

In the Sort Row under the strLastName column, either Press the letter A on the keyboard or using the drop down list select Ascending to sort by last name.

Field:	strFirstName	strLastName	
Table:	tblPersonnel	tblPersonnel	1
Sort:		ascending	
Show:	V	Ascending	
Criteria:		Descending	
or:		(not sorted)	

Important Notes \$\mathcal{I}\$ on working with queries in design view:

- Sorting in Query Design View: Access sorts according to the position of the columns so if we wanted to sort by Last Name and then by First Name, we would rearrange the position of the columns so that the strLastName field is before the strFirstName field. When we discuss reports, I will encourage you to perform your grouping and sorting in reports, not queries. Without specifying a sort, Access will sort your query as it does the table - by the primary key; therefore, our query in datasheet view sorts by SSN although the SSN field is NOT including in our grid.
- Re-Run a Query: If you want to re-run a query in datasheet view, Press Shift + F9 key; this is particularly helpful in parameter queries that we will cover later.
- Moving columns: Just as in Excel, you may select a column or multiple columns by placing your cursor above the column until you see a dark, little downward pointing arrow, then click and drag across the Field: strFirstName strLastName tblPerson Table: columns to select multiple columns. To move a column, tblPersonne Ascending Sort: click at the top of the column and release your mouse Criteri button. Place your cursor at the top of the column on the border bar, your cursor will turn into a Northwesterly pointing arrow, you may click and drag your column or columns to their new position. A dark line between the columns will alert you to where you are moving the columns. Release your mouse button. This requires excellent mouse skills! Congratulations, if you get this correct the first few times you try it -



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you are a genius - I have used this for several years and still get columns all messed up.



strST

tblPersonnel



- 1. In the criteria row for strST (State Field), type ga (In this case the query is not case sensitive.),
- 2. Press Enter. Access will place quotation marks around your criteria state abbreviation.
- 3. Click the Red Exclamation button or the Run button.
- 4. Only people in GA appear on the Datasheet. Also, the information is sorted by Last Name as we accomplished earlier in the grid.
- 5. Click your Design View icon.
- 6. Select ga and change the state abbreviation to NY.
- 7. Run the query.
- 8. Practice with other states if those states are not in the table no records will show in the query's datasheet view.

Let's look at two states - GA and NY.

- 1. In the criteria row under strST, Type: ga or ny.
- 2. Press enter.
- 3. Access will capitalize the "or" for you and put quotation marks around your states as pictured at right.
- 4. Run your query.
- 5. Both GA and NY personnel appear on the datasheet view.
- 6. Delete your criteria from your grid by selecting the text "ga" OR "ny" in the criteria row and pressing the delete key on your keyboard. The criterion deletes.

Let's look at associates in specific departments.

- 1. In the criteria row under the strDeptCode column, type sls.
- 2. Access will put in the quotation marks for you to run the Structured Query Language query.
- 3. Click the Run Icon or the Datasheet View Icon.
- 4. The query displays our associates in the Sales Department.

		W.		
"ga"				
	"ga"	"ga"	"ga"	Landau Contraction of the land

17

strST
tblPersonnel
V
"ga" Or "ny"



- 6. Click the Design View icon.
- 7. In the criteria row under strDeptCode after the "sls", Type or "itd". Access will capitalize the "or" for you.
- 8. Run the query. Now both Sales and Information Technology department associates display.
- 9. Click the Design Icon.
- 10. Select or highlight the criteria in the strDeptCode field and Press the delete key on your keyboard. The criterion deletes.
- 11. Click the save icon and save your query as qryDirectory.
- 12. Practice several select queries using the other fields, such as view results for a specific city or several cities or view your information by ZIP Code.

Now, let's use a popular wildcard character - the asterisk *.

- 1. Open the qryDirectory in Design View.
- 2. With all of your criteria deleted, in the strLastName column,
- 3. Enter s* in the criteria row,
- 4. Press Enter and Access will insert the word Like and quotation marks for you – this is Structured Query Language entries that Access automates for us (

Query Language entries that Access automates for us (Thank goodness!) This displays at right.

- 5. Run your query or place it in datasheet view.
- 6. Only associates whose last name begins with S appears!
- 7. The asterisk * (Shift + 8 keys) tells Access to use any value after the initial character.
- 8. Place your query in design view.
- 9. Try different letters, such as J or M to view people by these letters.
- 10. Delete this criteria and Save your query.

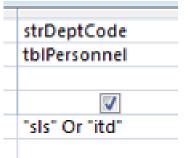
Your Important Notes 1:

teris	sk *.	
Field	strEinstName	ctrl actName

Field:	strFirstName	strLastName
Table:	tblPersonnel	tblPersonnel
Sort:		Ascending
Show:	V	V
Criteria:		Like "s*"
or:		



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Let's sorting first by Last Name and then by First Name, yet view our information by First Name and then Last Name.

- With qryDirectory in design view, add the strLastName field to your grid a second time by clicking the strLastName field in the table box and dragging the field to the beginning of your grid to place this field first, since we want to sort first by this field – Remember the query sorts according to your column order.
- 2. In the Sort Row box's drop down pick list choose Ascending or type A in the sort row and Ascending will appear for you.
- Next, in the first strLastName field Uncheck the Show Box (I call this the Missouri Box since it is the Show Me

Field: Table:	strLastName tblPersonnel	strFirstName tblPersonnel	strLastName tblPersonnel
Sort:	Ascending	Ascending	
Show:		V	V
Criteria:			

state – this is the show me box and we do not need to see this field in the datasheet view; however, we do need to have the field on the grid and the sort completed.)

- 4. Next, in the sort row for strFirstName choose Ascending or type A in the sort row and Ascending will appear for you.
- 5. Your screen should resemble the one above.
- 6. Run your query or place it in datasheet view and your information is sort correctly scroll to the last name of Jones or Smith.
- 7. Save and Close your qryDirectory.





<u>Reports</u>

Overview and Purpose

Reports are the most popular method of viewing data in a database. *Reports are designed for printing; however, reports can be viewed on a monitor.* As stated earlier, forms are designed for the monitor, yet can be printed – reports are designed for the printer, yet can be viewed on a monitor. Unlike forms, you cannot input, edit, or delete records using reports – only view information. *Reports provide grouping, sorting, sub-totals, grand totals, and ability to view data in many, many ways.* Reports are the advertising agency for a database and are powerful ways to display detail information or provide Summary data. *Database reports can contain complex mathematical operations and computations for fields or combination of fields.* Again, what Forms can accomplish for displaying dazzling formats for information on the screen, Reports accomplish for the printed page

Reports are based on tables OR queries.

Sample Reports

Detail Report with Groups, Sub-Totals, Grand Totals

- 1. In the 2007 Access DB database, Choose the Report Objects in the Navigation Pane.
- 2. Double click rptPayReport.
- 3. Since reports are designed for the printer, Access takes you into Print Preview for Report Viewing. If you are familiar with the Print Preview screen in other Microsoft Office applications this screen will look familiar to you.
- Use the Navigation buttons at the bottom of the screen to go to Page 2. This is similar to the

Page: 14	4 2	+	H	12	🐨 No Filter

Record Navigation buttons found in Datasheet view of tables, forms, and queries, except you move through pages not records.



This report is a typical database type of report and contains the following elements:

- ✓ Based upon a query named qryMyPayReport
- ✓ Provides a different page for each department
- ✓ Groups sub-totals by Department
- ✓ Lists Detail records for employees
- Employee records are sorted by Annual Salary in Greatest to Least order
- ✓ Provides percentages of totals
- ✓ Includes a bottom line Grand Total at the end of the report.

Click the Close Print Preview button on the Print Preview tab.

Summary Report

- 1. Back in the Reports objects, Double Click the rptPayReportSummary to open the report.
- 2. This report is the same as the previous report, except this summarizes data by Department and only displays the totals for department; therefore, no detail records are revealed. These reports are preferred when your database contains thousands of detailed records. However, in troubleshooting a database and verifying accuracy, detailed records are needed.
- 3. Scroll through and review the report.
- 4. Finally, Close the report by Clicking the Close Print Preview Button.

Ad Hoc Reports

- 1. At the Navigation Pane and in the Reports Section,
- 2. Open the rptOrders report.
- 3. Since this report is based upon a parameter query, a dialogue box appears requesting a customer Click OK to view all customers.
- 4. The report will ask you for the first date Type 01/01/00,
- 5. Press the enter key or click the OK button.
- 6. Next another dialogue box appears requesting the second date Type 12/31/08.
- 7. Press the enter key or click the OK button. Your report appears in Print Preview.



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The report illustrates by Customer the products ordered during this period of 01/01/00 through 12/31/08. Reports based upon parameter queries are very popular and allow for quick, yet powerful, "*ad hoc*" reporting. *Ad hoc reporting* allows you to create the fields, time periods, names, etc. that you want to view rather than "canned" or pre-programmed reports that do not fit your specific needs. We have used customer and dates for our parameter, but there are many ways to construct parameters for alphabetical characters, numbers, and so on. This demonstrates the power of using parameter queries with reports.

- 1. Scroll through and review the report.
- 2. Finally, Close the report by Clicking the word Close on the Print Preview toolbar.

Now, as we did earlier in this course, let's view the query qryOrders that this report is based upon.

- 1. In the query objects open qryOrders.
- 2. As with the reports, the dialogue boxes will appear. At the customer dialogue box, Click OK.
- 3. A dialogue box appears requesting the first date Type 01/01/00,
- 4. Press the enter key or click the OK button.
- 5. Next another dialogue box appears requesting the second date Type 12/31/08.

6. Press the enter key or click the OK button.

Notice that all of the fields in the query are not in the report. As explained earlier, the query performs the calculations; however, the report performed the sub-totals and grand totals. Although the query view can be informative, the report is easier to read and provides additional functionality, such as grouping by department and providing our sub-totals and grand totals that queries are not designed to do. Most of us prefer looking at the pretty reports and not datasheet queries.

7. Close the query.

Specialized Reports

Database reports can be highly specialized based upon the application and the needs of the users. We will look at labels using Access to view labels.

1. In the Report Objects, open the Report rptAddrLables.

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- 2. Access quickly produces labels ready for printing. Last Name sorts this report alphabetically. As with all other objects, as information or data is added or changed to this database these labels will reflect the changes the next time the report is retrieved.
- 3. Close your labels.

Now, let's start building our own fantastic reports.

Your Important Notes 1:



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Fundamentals of Reports and Report Design

The *qryDirectory* would make a good report to distribute to our company's associates, and the query would make excellent mailing labels. Let's examine my favorite and most powerful *Access Wizards*, the *report and the label wizards*.

On a Happy Note: Thankfully, the Report Wizard and the Report Design view are very much like the Form Wizard and Form Design, so we the Tabs, Groups, and buttons will be familiar.
 And moving, resizing, and formatting your captions and fields is the same as in forms.

As I wrote earlier, using the **Datasheet View** for viewing or printing information is functional but not attractive and does not group items or provide sub-totals, calculations, or grand totals; however, as we have learned the **Datasheet View** is excellent as you design your database, test validation rules, and troubleshoot. Once I have the tables, relationships, and queries complete, I am off to see the **Form** and **the Report Wizards**. That's why I used the **Form Wizard** early in the course and why I'm introducing the **Report Wizard** here (also, to break the monotony of **Tables** and **Queries**).

Report Wizard

- 1. In the Query Objects section of the Navigation Pane,
- 2. Select the query qryDirectory.
- 3. With the qryDirectory query highlighted, Click the Create Tab on the Ribbon and in the Reports Group Click the Report Wizard button as displayed here.



4. The Report Wizard activates.



Report Wizard



Here are the steps through the Wizard:

- Since we had the qryDirectory selected in the Query Objects, the "Choose the table or query where the objects data comes from" window does not display; otherwise, we would need to select the correct table or query.
- 2. Our Tables/Queries box contains our correct query since this is the query we selected in the Navigation Pane.
- 3. Click the Double Headed Arrow (Circled here) to move all of the Available Fields section to the Selected Fields section for these fields' inclusion in the Report.
- 4. Click Next.
- 5. Next the Wizard asks "Do you want to add any grouping levels?" We don't want any grouping levels. If there is a grouping level denoted by a blue heading with a field name (such as strST) in the preview of the report, Click the < arrow to send the</p>

Which fields do you want on your report? You can choose from more than one table or query. Tables/Oueries Query: gryDirectory -Available Fields: Selected Fields: strFirstName strLastName strAddr1 >> strAddr2 strCity strST strZIP strHomePhone Next > Cancel Finish

Report Wizard	-4. Otto
Do you want to add any grouping levels?	strFirstName, strLastName, strAddr1, strAddr2, strCity, strZIP, strHomePhone, strDeptCode
Grouping Options Cancel	< Back Next > Finish

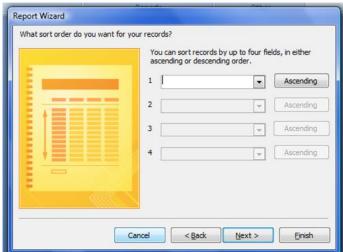
grouping back to Available fields. Access incorrectly assumed I wanted strST to serve as a group so I Clicked the < arrow in order to have no grouping on this report. We will group in our future reports. Ensure you have removed your grouping.

6. Click Next.





- 7. The Sorting Dialogues box appears. Leave this pane blank. Let's see how the report sorts – does it sort by the query's sort of Alphabetical by Last Name and then First Name OR does the repot sort by the Primary Key – SSN (even though SSN is not in our field list.)
- 8. Click Next.



9. In the lay out dialogue box, choose Tabular if it is not selected. In the Orientation section, choose Landscape. Keep the Check mark for "Adjust the field width so all fields fit on a page."

Layout O Columnar O Iabular O Justified	Orientation Portrait Landscape
Adjust the field a page.	width so all fields fit on

10. Click Next.

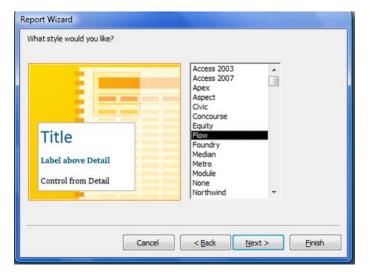
 In the style dialogue box, choose a style that you like. I will go with The Flow. Like Forms these styles and AutoFormats are easy to change and to save.

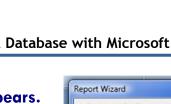
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12. Click Next.

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13. Finally, name the report rptDirectory and ensure that the Option Button for Preview the Report is selected.

14. Click Finish.

Since reports are designed for printing, the report is placed in *Print Preview*. All is well except the *rptDirectory* tab heading. We want to change the title to Associate Contact Information. We will make this change and many others in *Design View* in our next section.

Report Wizard	
	What title do you want for your report? rptDirectory
	That's all the information the wizard needs to create your report. Do you want to preview the report or modify the report's design? Preview the report. Modify the report's design.
(Cancel < Back Next > Finish

My Beautiful Directory Report.

8		rint Preview	•••••••••••••••••••••••••••••••••••••••	;			Our Database			N.				_ 0 ×
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n Pa			Greg	Creech	1333 LaVenture Drive		Chamblee	GA	30341-	(404) 123-4890	SLS			
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		1	Daffy	Duck	1551 Lake Blvd	Suite 200	Hollywood	CA	08234-	(777) 283-9499	ITD			
		1	Benjamin	Frankling	1601 Pensylvania Ave		Atlantic City	NJ	01122-	(111) 234-4403	HRC			
		1	Kermitt	Frogg	1 Lilly Pad Road		Lake City	FL	32222-000		ENG			
		J	Judy	Garland	51 West End Av	Suite 300	New York City	NY	01278-4300	(212) 883-9492	ACC			
		:	Space	Ghost	613 Christopher Street	Apt 103	New York City	NY	°3 ⁸ 49 ⁻ 399	(212) 938-8889	ITD			
		:	Spedro	Gonzales	100 Market Drive	Suite 5100	San Francisco	CA	10101-0011	(414) 001-2340	ITD			
		1	Bobby	Good	1350 Avenue A	#16	New York City	NY	01234-040	(212) 384-90 20	HRC			
		1	Leslie	Goodman	137 Market Street		San Francisco	CA	01234-	(999) 234-1234	SLS			
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