Basic Terminology and Concepts

Datasheet View

Creating Tables

Microsoft Access
What Is a Database?

- **Database**: a collection of related information; elements of a database are called objects

- **Access Database Objects**
  - **Table**: Used to store and manipulate data; a table is the first object created in a database
  - **Query**: Used to retrieve information
  - **Form**: Used to view one record of data
  - **Report**: Used to present, calculate, summarize, and print table data
  - **Macro/Module**: Used to automate frequently performed procedures
A Database Example

Information about a company’s products and employers stored in the database. Various objects (tables, forms, reports) are created using the information in the database.
The database window is the command center; it provides the means to create, view, and edit database objects, such as tables, forms, and reports.
**Table Basics and Datasheet View**

- **Table**: the primary element for collecting related data, organized into rows and columns
- **Record**: an individual entry in a table (row)
- **Field**: a piece of data in a record (column)
- The intersection of a row and column is called a **cell**
- + indicates record is expandable to show related table information
- Current record is highlighted
- Default sort order = primary key

![Table Example](image-url)
Navigating in a Datasheet

- Enter/(Shift)Tab
- Page Up/Page Down
- Home/End
- Arrows

Can use in combination with Ctrl

- File|Access
- Options|Advanced
Editing Table Data

♦ To edit data
  – Click in a cell
  – Press F2

♦ To save data
  – Select another record
  – Press Shift|Enter

♦ Use Undo Button or press Esc if you want to reverse the most recent changes (only)

♦ BE CAREFUL: Access “saves as you go,” once you begin to edit another record, the previous record is saved and can’t be undone!
Adding, Deleting and Summarizing Records

- Use the shortcut menu by right clicking at the beginning of row/record or Home Ribbon | Records Group
- Records get added at the bottom of the table
- Deletion of records CANNOT BE UNDONE!
- Get quick aggregates by using Totals button
Designing a Database

1. Determine your output requirements
2. Design your database on paper first
3. Divide information into separate fields
4. Divide information into separate tables
5. Identify each record with a unique code
6. Place important fields at top of structure
7. Test your database
Getting Started

♦ **OPTION 1: Use a Template**
  Use a professionally designed database with the help of a Wizard or Template

♦ **OPTION 2: “Manual” Method**
  Create a blank database and then create your own objects (beginning with a table)
Option 2: The “Manual” Method

- If access is open
  - File | New
- If access is not already open
  - Start Access
- Select New Blank Database
Creating a Table in Design View

- Displays the specifications behind each field
- Each row is information about an individual field
  - Field Name, type and comments (optional)
  - Properties ("bells and whistles", efficiency, accuracy, consistency)
- Set primary keys
- Switch back to datasheet view to enter records
<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text</td>
<td>Alphanumeric data, up to 255 characters. Used for entering text and numbers that are not required for calculation, such as zip codes and phone numbers.</td>
</tr>
<tr>
<td>Memo</td>
<td>Alphanumeric data, up to 65,535 characters. Used to store notes, comments, or lengthy descriptions.</td>
</tr>
<tr>
<td>Number</td>
<td>Numeric data that are used to perform mathematical calculations.</td>
</tr>
<tr>
<td>Date/Time</td>
<td>Dates and times.</td>
</tr>
<tr>
<td>Currency</td>
<td>Numeric data with a leading dollar sign. Used to store and calculate monetary values up to four decimal places.</td>
</tr>
<tr>
<td>AutoNumber</td>
<td>Numeric value that increments automatically. Used for assigning a unique value to a record, which makes it a fantastic primary key field.</td>
</tr>
<tr>
<td>Yes/No</td>
<td>Logical or Boolean values for toggling (turning on and off) yes/no or true/false results.</td>
</tr>
<tr>
<td>OLE Object</td>
<td>Object Linking and Embedding (OLE) field for storing objects (Excel worksheets and Word documents), graphics, or other binary data up to one gigabyte (GB) in size.</td>
</tr>
<tr>
<td>Hyperlink</td>
<td>Text or numbers stored as a hyperlink address. Used to store Web site addresses, also called URLs, such as <a href="http://www.advantageseries.com/">http://www.advantageseries.com/</a>.</td>
</tr>
<tr>
<td>Lookup Wizard</td>
<td>A link to another table or to a static list of values for inserting data into the current table. Selecting this option launches the Lookup Wizard.</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Field Size</td>
<td>Define the maximum length of a text or numeric field.</td>
</tr>
<tr>
<td>Format</td>
<td>Specify how text, numbers, dates, and times are displayed and printed.</td>
</tr>
<tr>
<td>Decimal Places</td>
<td>Specify the number of places to display to the right of the decimal; for numeric and currency fields only.</td>
</tr>
<tr>
<td>Input Mask</td>
<td>Simplify data entry for fields that have a standard format, such as a phone number.</td>
</tr>
<tr>
<td>Caption</td>
<td>Define a default field label to appear on forms and reports, instead of using the field name.</td>
</tr>
<tr>
<td>Default Value</td>
<td>Define a value or expression that is automatically entered for each new record.</td>
</tr>
<tr>
<td>Validation Rule</td>
<td>Enter an expression that defines the rules for entering data into the specified field.</td>
</tr>
<tr>
<td>Validation Text</td>
<td>Specify the text to display if you enter invalid data, according to the set rule, into a field.</td>
</tr>
<tr>
<td>Required</td>
<td>Specify whether a value is required in a field. Access displays an error message if you attempt to skip entering data into the field.</td>
</tr>
<tr>
<td>Indexed</td>
<td>Specify whether the table should be indexed on this field in order to speed searches.</td>
</tr>
</tbody>
</table>
Primary Keys and a little on relationships

♦ In design view
  – Right Click field row
  – Primary Key button

♦ Determines the default sort order in which data is displayed in datasheet view

♦ Unique identifier

♦ Aids in creating relationships

♦ Field cannot be empty (null) or a duplicate
Sorting Records

- Default sort order = primary key
- Sort to better organize and present data
- Select a field and use the sort ascending or descending buttons in the Home Ribbon (entire table does not need to be selected)
- Multiple sorts: place columns in order from left to right and select both prior to sorting
- New records (which are added to the bottom of the table) will re-sort into correct order when table is closed and saved
- Save table design to save sort order
What is a Filter?

- Finds and displays records in a table which meet a simple set of criterion
- Records not meeting criterion are hidden
- Used to quickly, temporarily find a set of information
  - Usually not saved; all records are shown once table is closed and reopened or filter is removed
  - Can be saved as a query using advanced methods
- More than one filter can be applied to a table
  - “And” statement with right clicks
  - Advanced methods allow for “or” statements
Filtering Methods

♦ Home Ribbon | Sort & Filter Group
♦ Right click in a field
  – Depending on field type, different shortcut menus are displayed
  – Use Advanced button if operator is not listed in shortcut menu
♦ Remove filter(s) with Toggle Filter button
What is a Query?

- A query is a question you ask of your database
  - How many customers live in Chicago?
  - What is the average age of our employees?
- There are two types of queries
  - **Select** queries retrieve table information
  - **Action** queries modify table information
- Results are displayed in a dynaset: a collection of fields from one or more tables
- Queries can be used for forms and reports
- Since data is retrieved from tables, if table data changes, the query is automatically updated and vice versa
Queries Versus Filters

♦ Queries provide additional functionality
  – Data can be displayed from multiple tables
  – Field display can be controlled
  – Calculations can be created and performed on field values

♦ While filters are temporary, queries are saved as an object in the database

♦ Create Ribbon | Other Group | Query Design
Using the Query Design Window

The process:
1. Select the table(s)
2. Move fields down to the grid
3. Enter the criterion
4. Run the query

Select the tables and/or queries to be used (ctrl and shift keys work for multiple selection)

Use the Show Table button to show listing again

Displays table(s) on which you’ve chosen to base your query

Displays the grid that you use to specify your criteria and sorting options

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Query Grid Area

- Creates a “query by example” area
- Field: used to add a field to the grid
- Table: used to indicate the field’s table
- Sort: used to sort the resulting table
- Show: used to hide or show the field in the resulting dynaset
- Criteria: used to set the query criteria, multiple criteria placed on the criteria row means “and”
- Or: used to specify additional “or” criterion
- After creating query parameters, switch to datasheet view or click the Run button to see dynaset
Specifying a Search Criteria

- Enter an example of values to be found in the Criteria row (and use OR row if necessary)
- Criterion statements can use to limit records between a range of values or dates
  - Wildcards: *, # and ?
  - Comparison: =, >, <, >=, <=
  - Logical: and, or, not
  - Arithmetic: +, -, /, *
  - Like (contains)
  - Between X and Y (X and Y can be numbers or dates)
  - In (replaces multiple OR statements)
  - Is [not] null (empty)
- Single or complex criterion can be used
- Conditional logic is the method by which criteria statements are joined and executed in a query statement (using multiple tables and fields with “and” “or” conditions)
- General rule: AND reads across, OR reads down
Querying Multiple Tables and Creating Relationships

Tables can be related for the purpose of sharing information and reducing data redundancy and entry.

Two tables joined by a common field
The Purpose of Relationships

- The goal should be to never have to enter data redundantly.
- Create relationships by joining fields from each table that contain the same type of data.
- Use of the primary key becomes evident:
  - When tables are joined, Access must know exactly what record in one table is being matched to a record in the related table (there cannot be more than one choice).
  - A unique identifier (primary key, which prohibits duplicates) is the only way Access can be sure to match records correctly.
Options for creating a report from the Create Ribbon
- Report wizard
- Report Button (AutoReport)
- Label wizard
- Report Design

Create the report using a wizard or AutoReport (not in design view)

Customize the report in design or layout view
Using the Report Wizard

1. Select table(s) or query(ies)
   - Tables show all records and fields in the table
   - Queries show only records and fields used in the query
   - If a relationship has been created, more than one table or query can be used in the report

2. Select fields

3. Grouping: rather than displaying the same field in every record, it displays once with details following

4. Sort

5. Choose layout

6. Choose design

7. Name and save
Report Button

- Select a table or query, and click report button
- Report uses all fields in the table or query
- Layout is tabular
- Completed report appears in Layout View
Specify the unit of measure, manufacturer, label size and format, such as Avery 5160

Select fields and enter text for the label prototype

Type text that should appear on every label on the prototype

Confidential
Personal
Dated Material
Reports: Print Preview

- Use the Print Preview Ribbon to modify page layout and display multiple pages
- Navigate through pages using page navigation arrow in lower right corner
Reports: Layout View

- Provides a preview of report using sample data
  - Not an exact preview
  - Use Print Preview to see exact preview
- Can modify most aspects of report design using Format and Arrange Ribbons
  - Font, alignment, borders, colors
  - Sorting
  - Adding/removing fields
  - Control size
Reports: Design View

- Reports consist of different sections and controls
- All sections and controls can be moved and resized in design view
Report Controls

- A bound control is one whose source of data is a field in a table or query.
- An unbound control does not have a source of data, examples are a title/label or image.
- A calculated control is used to create expressions for calculations.
- Use Right Click | Properties | Data tab to see a control’s status:
  - A bound control will list the field that it is bound to.
  - An unbound control will display nothing in the Data tab.
  - A calculated field will show the expression.
- Add text with label button (Aa), calculation with text box (ab|) button and customize image placement, all in Design Ribbon.
Report Views Summary: From the Home Ribbon

♦ **Report View**
  - Allows copying of data
  - Filters can be applied (temporarily)

♦ **Print Preview**
  - Displays data as it will be printed
  - Changes can only be applied to page layout

♦ **Layout View**
  - Almost all formatting and design changes can be applied in this view

♦ **Design View**
  - Provides access to ALL formatting and design changes that are available