WRITTEN BY MICHAEL ALEXANDER DICK KUSLEIKA

Access 2013 BBBBBE

THE COMPREHENSIVE TUTORIAL RESOURCE

CREATE TABLES AND DESIGN DATABASES

INTEGRATE ACCESS WITH OTHER APPLICATIONS BUILD FORMS AND REPORTS TO VIEW AND SHARE DATA



Access® 2013 Bible

Table of Contents

Introduction

Part I: Access Building Blocks

Chapter 1: An Introduction to Database Development

```
The Database Terminology of Access
```

Databases

<u>Tables</u>

Records and fields

Values

Relational Databases

Access Database Objects

Datasheets

Queries

Data-entry and display forms

Reports

Database objects

A Five-Step Design Method

<u>Step 1: The overall design — from concept to reality</u>

Step 2: Report design

Step 3: Data design

Step 4: Table design

Step 5: Form design

Chapter 2: Getting Started with Access

The Access Welcome Screen

How to Create a Blank Desktop Database

The Access 2013 Interface

The Navigation pane

The Ribbon

The Quick Access toolbar

Part II: Understanding Access Tables

Chapter 3: Creating Access Tables

Table Types

Object tables

Transaction tables

Join tables

Creating a New Table

Designing tables

<u>Using the Design tab</u>

Working with fields

Creating tblCustomers

<u>Using AutoNumber fields</u>

Completing tblCustomers

<u>Changing a Table Design</u>

Inserting a new field

Deleting a field

Changing a field location

Changing a field name Changing a field size Handling data conversion issues Assigning field properties <u>Understanding tblCustomers Field Properties</u> Setting the Primary Key Choosing a primary key <u>Creating the primary key</u> Creating composite primary keys **Indexing Access Tables** The importance of indexes Multiple-field indexes When to index tables Printing a Table Design Saving the Completed Table **Manipulating Tables**

Renaming tables

Deleting tables

Copying tables in a database

Copying a table to another database

Adding Records to a Database Table

Understanding Attachment Fields

Chapter 4: Understanding Table Relationships

Building Bulletproof Databases

Data Normalization and Denormalization

First normal form

```
Second normal form
    Third normal form
    Denormalization
 Table Relationships
    Connecting the data
    One-to-one
    One-to-many
    Many-to-many
 Integrity Rules
    No primary key can contain a null value
    All foreign key values must be matched by corresponding primary keys
 <u>Keys</u>
    Deciding on a primary key
    Looking at the benefits of a primary key
    Designating a primary key
    <u>Creating relationships and enforcing referential integrity</u>
    <u>Viewing all relationships</u>
    <u>Deleting relationships</u>
    Following application-specific integrity rules
Chapter 5: Working with Access Tables
 <u>Understanding Datasheets</u>
 Looking at the Datasheet Window
    Moving within a datasheet
    <u>Using the Navigation buttons</u>
    Examining the Datasheet Ribbon
```

Opening a Datasheet

```
Entering New Data
   Saving the record
   <u>Understanding automatic data-type validation</u>
   Knowing how properties affect data entry
Navigating Records in a Datasheet
   Moving between records
   Finding a specific value
Changing Values in a Datasheet
   Manually replacing an existing value
   Changing an existing value
<u>Using the Undo Feature</u>
Copying and Pasting Values
Replacing Values
Adding New Records
<u>Deleting Records</u>
<u>Displaying Records</u>
   Changing the field order
   Changing the field display width
   Changing the record display height
   Changing display fonts
   Displaying cell gridlines and alternate row colors
   Aligning data in columns
   Hiding and unhiding columns
   <u>Freezing columns</u>
   Saving the changed layout
```

Saving a record

Sorting and Filtering Records in a Datasheet

Sorting your records with QuickSort

Filtering a selection

<u>Filtering by form</u>

Aggregating Data

Printing Records

Printing the datasheet

<u>Using the Print Preview window</u>

Chapter 6: Importing and Exporting Data

How Access Works with External Data

Types of external data

Ways of working with external data

Options for Importing and Exporting

How to Import External Data

<u>Importing from another Access database</u>

<u>Importing from an Excel spreadsheet</u>

Importing a SharePoint list

<u>Importing data from text files</u>

Importing and exporting XML documents

Importing and exporting HTML documents

<u>Importing Access objects other than tables</u>

Importing an Outlook folder

How to Export to External Formats

Exporting objects to other Access databases

Exporting through ODBC drivers

Exporting to Word

Publishing to PDF or XPS

Chapter 7: Linking to External Data

Linking External Data

<u>Identifying linked tables</u>

Limitations of linked data

<u>Linking to other Access database tables</u>

Linking to ODBC data sources

Linking to non-database data

Working with Linked Tables

Setting view properties

<u>Setting relationships</u>

Optimizing linked tables

Deleting a linked table reference

Viewing or changing information for linked tables

Refreshing linked tables

Splitting a Database

The benefits of splitting a database

Knowing where to put which objects

Using the Database Splitter add-in

Part III: Working with Access Queries

Chapter 8: Selecting Data with Queries

<u>Introducing Queries</u>

What queries are

What queries can do

What queries return

```
Creating a Query
   Adding fields to your queries
   Running your query
Working with Query Fields
   Selecting a field in the QBE grid
   Changing field order
   Resizing columns in the QBE grid
   Removing a field
   Inserting a field
   Hiding a field
   Changing the sort order of a field
Adding Criteria to Your Queries
   <u>Understanding selection criteria</u>
   Entering simple string criteria
   Entering other simple criteria
Printing a Query's Recordset
Saving a Query
<u>Creating Multi-Table Queries</u>
   Viewing table names
   Adding multiple fields
   Recognizing the limitations of multi-table queries
   Overcoming query limitations
Working with the Table Pane
   Looking at the join line
   Moving a table
   Removing a table
```

Adding more tables
Creating and Working with Query Joins
<u>Understanding joins</u>
<u>Leveraging ad hoc table joins</u>
Specifying the type of join
<u>Deleting joins</u>
Chapter 9: Using Operators and Expressions in Access
<u>Introducing Operators</u>
<u>Types of operators</u>
Operator precedence
<u>Using Operators and Expressions in Queries</u>
<u>Using query comparison operators</u>
<u>Understanding complex criteria</u>
<u>Using functions in select queries</u>
Referencing fields in select queries
Entering Single-Value Field Criteria
Entering character (Text or Memo) criteria
The Like operator and wildcards
Specifying non-matching values
Entering numeric criteria
Entering true or false criteria
Entering OLE object criteria
<u>Using Multiple Criteria in a Query</u>
<u>Understanding an Or operation</u>

Specifying multiple values with the Or operator

<u>Using the Or cell of the QBE pane</u>

Using a list of values with the In operator

Using And to specify a range

<u>Using the Between...And operator</u>

Searching for null data

Entering Criteria in Multiple Fields

Using And and Or across fields in a query

Specifying Or criteria across fields of a query

<u>Using And and Or together in different fields</u>

A complex query on different lines

<u>Chapter 10: Going Beyond Select Queries</u>

<u>Aggregate Queries</u>

Creating an aggregate query

About aggregate functions

Action Queries

Make-table queries

<u>Delete queries</u>

Append queries

<u>Update queries</u>

Crosstab Queries

<u>Using the Crosstab Query Wizard</u>

Manually creating a crosstab query

Part IV: Analyzing Data in Access

Chapter 11: Transforming Data in Access

Finding and Removing Duplicate Records

<u>Defining duplicate records</u>

Finding duplicate records

Removing duplicate records

Common Transformation Tasks

Filling in blank fields

Concatenating

Changing case

Removing leading and trailing spaces from a string

Finding and replacing specific text

Adding your own text in key positions within a string

Parsing strings using character markers

Chapter 12: Working with Calculations and Dates

<u>Using Calculations in Your Analyses</u>

Common calculation scenarios

Constructing calculations with the Expression Builder

Common calculation errors

<u>Using Dates in Your Analyses</u>

Simple date calculations

Advanced analysis using functions

Chapter 13: Performing Conditional Analyses

Using Parameter Queries

How parameter queries work

Ground rules of parameter queries

Working with parameter queries

Using Conditional Functions

The IIf function

0001	0		1	C	
The	SI	いけん	h	tun	ction

Comparing the IIf and Switch functions

Chapter 14: Fundamentals of Using Access SQL

<u>Understanding Basic SQL</u>

The SELECT statement

The WHERE clause

Making sense of joins

Getting Fancy with Advanced SQL Statements

Expanding your search with the Like operator

Selecting unique values and rows without grouping

Grouping and aggregating with the GROUP BY clause

Setting sort order with the ORDER BY clause

Creating aliases with the AS clause

Showing only the SELECT TOP or SELECT TOP PERCENT

Performing action gueries via SQL statements

Creating crosstabs with the TRANSFORM statement

<u>Using SQL Specific Queries</u>

Merging datasets with the UNION operator

Creating a table with the CREATE TABLE statement

Manipulating columns with the ALTER TABLE statement

Creating pass-through queries

<u>Chapter 15: Subqueries and Domain Aggregate</u> Functions

Enhancing Your Analyses with Subqueries

Why use subqueries?

Su]	bgi	uery	C	<u>round</u>	ru]	<u>les</u>

<u>Creating subqueries without typing SQL statements</u>

<u>Using IN and NOT IN with subqueries</u>

<u>Using subqueries with comparison operators</u>

<u>Using subqueries as expressions</u>

<u>Using correlated subqueries</u>

<u>Using subqueries within action queries</u>

Domain Aggregate Functions

<u>Understanding the different domain aggregate functions</u>

Examining the syntax of domain aggregate functions

<u>Using domain aggregate functions</u>

<u>Chapter 16: Running Descriptive Statistics in Access</u>

Basic Descriptive Statistics

Running descriptive statistics with aggregate queries

Determining rank, mode, and median

Pulling a random sampling from your dataset

Advanced Descriptive Statistics

Calculating percentile ranking

Determining the quartile standing of a record

Creating a frequency distribution

Part V: Working with Access Forms and Reports

Chapter 17: Creating Basic Access Forms

<u>Formulating Forms</u>

Creating a new form

<u>Looking at special types of forms</u>

Resizing the form area

Saving your form

Working with Controls

<u>Categorizing controls</u>

Adding a control

Selecting and deselecting controls

Manipulating controls

Introducing Properties

Displaying the Property Sheet

Getting acquainted with the Property Sheet

Changing a control's property setting

Naming control labels and their captions

Chapter 18: Working with Data on Access Forms

Using Form View

Looking at the Home tab of the Ribbon

Navigating among fields

Moving among records in a form

Changing Values in a Form

Knowing which controls you can't edit

Working with pictures and OLE objects

Entering data in the Long Text field

Entering data in the Date field

<u>Using option groups</u>

<u>Using combo boxes and list boxes</u>

Switching to Datasheet view

Saving a record

```
Printing a Form
Working with Form Properties
   Changing the title bar text with the Caption property
   <u>Creating a bound form</u>
   Specifying how to view the form
   Removing the Record Selector
   Looking at other form properties
Adding a Form Header or Footer
Working with Section Properties
   The Visible property
   The Height property
   The Back Color property
   The Special Effect property
   The Display When property
   The printing properties
Changing the Layout
   Changing a control's properties
   Setting the tab order
   Modifying the format of text in a control
   <u>Using the Field List to add controls</u>
Converting a Form to a Report
```

Chapter 19: Working with Form Controls

Setting Control Properties

<u>Customizing default properties</u>

Looking at common controls and properties

Creating a Calculated Control

```
Working with Subforms
Form Design Tips
   Using the Tab Stop property
   Tallying check boxes
   <u>Using SQL for a faster refresh</u>
   Setting up combo boxes and list boxes
<u>Tackling Advanced Forms Techniques</u>
   <u>Using the Page Number and Date/Time controls</u>
   <u>Using the Image control</u>
   Morphing a control
   Using the Format Painter
   Offering more end-user help
   Adding background pictures
   Limiting the records shown on a form
<u>Using the Tab Control</u>
<u>Using Dialog Boxes to Collect Information</u>
   Designing the query
   Setting up the command buttons
   Adding a default button
   <u>Setting a Cancel button</u>
   Removing the control menu
Designing a Form from Scratch
   Creating the basic form
   <u>Creating a subform</u>
   Adding the subform
   Changing the form's behavior
```

Changing the form's appearance

Chapter 20: Presenting Data with Access Reports

1	n	tro	dп	ıci	in	Λī	R	Δ.	n	Λr	te.
d	.11	OT O	uu	LU.	111	9.	<u> </u>	<u></u>	<u>''</u>	$\sigma_{\mathbf{I}}$	LU

<u>Identifying the different types of reports</u>

<u>Distinguishing between reports and forms</u>

Creating a Report, from Beginning to End

Defining the report layout

Assembling the data

<u>Creating a report with the Report Wizard</u>

Printing or viewing the report

Saving the report

Banded Report Design Concepts

The Report Header section

The Page Header section

The Group Header section

The Detail section

The Group Footer section

The Page Footer section

The Report Footer section

Creating a Report from Scratch

Creating a new report and binding it to a query

<u>Defining the report page size and layout</u>

Placing controls on the report

Resizing a section

Working with text boxes

Changing label and text-box control properties

Growing and shrinking Text Box controls

Sorting and grouping data

Sorting data within groups

Adding page breaks

<u>Improving the Report's Appearance</u>

Adjusting the page header

Creating an expression in the group header

Creating a report header

<u>Chapter 21: Advanced Access Report Techniques</u>

Grouping and Sorting Data

Grouping data alphabetically

<u>Grouping on date intervals</u>

Hiding repeating information

Hiding a page header

Starting a new page number for each group

<u>Formatting Data</u>

<u>Creating numbered lists</u>

Adding bullet characters

Adding emphasis at runtime

Avoiding empty reports

<u>Inserting vertical lines between columns</u>

Adding a blank line every n records

Even-odd page printing

Using different formats in the same text box

Centering the title

Easily aligning control labels

Micro-adjusting control

Adding Data

Adding more information to a report

Adding the user's name to a bound report

Trying More Techniques

Displaying all reports in a combo box

Fast printing from queried data

<u>Using snaking columns in a report</u>

Exploiting two-pass report processing

Assigning unique names to controls

Part VI: Access Programming Fundamentals

Chapter 22: Using Access Macros

An Introduction to Macros

Creating a macro

Assigning a macro to an event

<u>Understanding Macro Security</u>

Enabling sandbox mode

The Trust Center

Multi-Action Macros

Submacros

Conditions

Opening reports using conditions

Multiple actions in conditions

<u>Temporary Variables</u>

Enhancing a macro you've already created

```
<u>Using temporary variables to simplify macros</u>
    Using temporary variables in VBA
 Error Handling and Macro Debugging
    The OnError action
    The MacroError object
    <u>Debugging macros</u>
 Embedded Macros
 Macros versus VBA Statements
    Choosing between macros and VBA
    Converting existing macros to VBA
Chapter 23: Getting Started with Access VBA
 <u>Introducing Visual Basic for Applications</u>
 <u>Understanding VBA Terminology</u>
 Starting with VBA Code Basics
 <u>Creating VBA Programs</u>
    Modules and procedures
    Working in the code window
 <u>Understanding VBA Branching Constructs</u>
    Branching
    Looping
 Working with Objects and Collections
    An object primer
    Properties and methods
    The With statement
    The For Each statement
```

Exploring the Visual Basic Editor

The Immediate window
The Project Explorer
The Object Browser
<u>VBE options</u>
<u>Chapter 24: Mastering VBA Data Types and Procedures</u>
<u>Using Variables</u>
Naming variables
<u>Declaring variables</u>
Working with Data Types
Comparing implicit and explicit variables
Forcing explicit declaration
<u>Using a naming convention</u>
<u>Understanding variable scope and lifetime</u>
<u>Using constants</u>
Working with arrays
<u>Understanding Subs and Functions</u>
<u>Understanding where to create a procedure</u>
<u>Calling VBA procedures</u>
<u>Creating subs</u>
<u>Creating Functions</u>
<u>Handling parameters</u>
Calling a function and passing parameters
<u>Creating a function to calculate sales tax</u>
Simplifying Code with Named Arguments
Chapter 25: Understanding the Access Event Model

Programming Events

<u>Understanding how events trigger VBA code</u>

<u>Creating event procedures</u>

Identifying Common Events

Form event procedures

<u>Control event procedures</u>

Report event procedures

Report section event procedures

Paying Attention to Event Sequence

<u>Looking at common event sequences</u>

Writing simple form and control event procedures

<u>Chapter 26: Debugging Your Access Applications</u>

Organizing VBA Code

Testing Your Applications

Testing functions

Compiling VBA code

<u>Traditional Debugging Techniques</u>

Using MsgBox

<u>Using Debug.Print</u>

<u>Using the Access Debugging Tools</u>

Running code with the Immediate window

Suspending execution with breakpoints

Looking at variables with the Locals window

Setting watches with the Watches window

Using conditional watches

<u>Using the Call Stack window</u>

Trapping Errors in Your Code

<u>Understanding error trapping</u>

The Err object

<u>Including error handling in your procedures</u>

Part VII: Advanced Access Programming Techniques

Chapter 27: Accessing Data with VBA Code

Working with Data

Understanding ADO Objects

The ADO Connection object

The ADO Command object

The ADO Recordset object

<u>Understanding DAO Objects</u>

The DAO DBEngine object

The DAO Workspace object

The DAO Database object

The DAO TableDef object

The DAO QueryDef object

The DAO Recordset object

The DAO Field objects (recordsets)

Writing VBA Code to Update a Table

<u>Updating fields in a record using ADO</u>

<u>Updating a calculated control</u>

Adding a new record

Deleting a record

Deleting related records in multiple tables

Chapter 28: Advanced Data Access with VBA

Adding an Unbound Combo Box to a Form to Find Data

Using the FindRecord method

<u>Using a bookmark</u>

Filtering a Form

With code

With a query

Chapter 29: Integrating Access and SQL Server

Introducing SQL Server Express

<u>Understanding Data Types in SQL Server</u>

<u>Installing SQL Server Express</u>

<u>Installing the database engine</u>

Installing a sample database

Getting to know Management Studio

Using the command line

Connecting to SQL Server

Creating a data source

Linking SQL Server to Access

Using ADO with SQL Server

Working with SQL Server Objects

Using SQL Server tables from Access

Views

Stored procedures

Triggers

<u>Chapter 30: Customizing the Ribbon</u>

The Ribbon Hierarchy
Controls for Access Ribbons
<u>Special Ribbon features</u>
Editing the Default Ribbon
Working with the Quick Access Toolbar
<u>Developing Custom Ribbons</u>
The Ribbon creation process
<u>Using VBA callbacks</u>
<u>Creating a Custom Ribbon</u>
Step 1: Design the Ribbon and build the XMI
Step 2: Write the callback routines
Step 3: Create the USysRibbons table
Step 4: Add XML to USysRibbons
Step 5: Specify the custom Ribbon property
The Basic Ribbon XML
Adding Ribbon Controls
<u>Specifying imageMso</u>
The Label control
The Button control
<u>Separators</u>
<u>Check boxes</u>
The DropDown control
The SplitButton Control
Attaching Ribbons to Forms and Reports

Completely Removing the Ribbon

<u>Chapter 31: Preparing Your Access Application for</u> Distribution

Defining the	Current	Database	Options
Domining the	Ouricit	Database	<u> </u>

Application options

Navigation options

Ribbon and toolbar options

Name AutoCorrect Options

Developing the Application

Building to a specification

Creating documentation

<u>Testing the application before distribution</u>

Polishing Your Application

Giving your application a consistent look and feel

Adding common professional components

Making the application easy to start

Bulletproofing an Application

<u>Using error trapping on all Visual Basic procedures</u>

Separating tables from the rest of the application

Building bulletproof forms

Validating user input

<u>Using the /runtime option</u>

Encrypting or encoding a database

Protecting Visual Basic code

Securing the Environment

Setting startup options in code

Disabling startup bypass

Setting property values

Getting property values

Part VIII: Access and Windows SharePoint Services

<u>Chapter 32: Understanding Windows SharePoint</u> Services

Introducing SharePoint

Reviewing Various Types of SharePoint Sites

Looking at a SharePoint Website

<u>Understanding SharePoint documents</u>

<u>Understanding SharePoint lists</u>

The Concept Behind Access and SharePoint Integration

Chapter 33: Integrating Access with SharePoint

Sharing Access Data with SharePoint

<u>Linking to SharePoint lists</u>

<u>Importing SharePoint lists</u>

Exporting Access tables to SharePoint

Moving Access tables to SharePoint

<u>Using SharePoint Templates</u>

<u>Chapter 34: Understanding Access Services</u>

Explaining Managed Applications

<u>Looking at Web Publishing in Access</u>

Why SharePoint?

<u>Leveraging SharePoint features</u>

<u>Understanding Access Services</u>

Examining Access Web Application Limits

Limitations of Access Services

Transactional limitations

<u>Chapter 35: Deploying Access Applications to</u> SharePoint

Publishing a Custom Access Application to SharePoint

Preparing the Access data model

<u>Initializing and configuring the custom web application</u>

Launching and managing your web application

Chapter 36: Using Access Data Macros

Introducing Data Macros

<u>Understanding Table Events</u>

"Before" events

"After" events

<u>Using the Macro Designer for Data Macros</u>

<u>Understanding the Action Catalog</u>

Program flow

Data blocks

Data actions

Creating Your First Data Macro

Managing Macro Objects

Collapsing and expanding macro items

Moving macro items

Saving a macro as XML

Recognizing the Limitations of Data Macros

Part IX: Appendixes

Appendix A: Access 2013 Specifications

Appendix B: Optimizing Access Applications

Organizing your modules

Pruning the call tree

Putting your application's code into a compiled state

<u>Losing the compiled state</u>

Tuning your system

Getting the most from your tables

Getting the most from your queries

Getting the most from your forms and reports

Getting the most from your modules

<u>Increasing network performance</u>

<u>Understanding how databases grow in size</u>

Recognizing that compiling and compacting may not be enough

Making small changes to large databases

<u>Appendix C: Understanding Query Performance and Database Corruption</u>

Normalizing your database design

<u>Using indexes on appropriate fields</u>

Optimizing by improving query design

Compacting and repairing your database regularly

<u>Identifying a corrupted database</u>

Recovering a corrupted database

Preventing database corruption