

DATA ANALYTICS FOR AUDITING USING ACL

4TH EDITION

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ISBN 978-0-912503-62-2

Printed in the United States of America.

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PREFACE

Preface

Objective

The objective of these materials is to help students with an interest in auditing learn how to apply ACL audit software to solve audit problems. The materials are designed to first help students learn how to use ACL and then use the software on increasingly complex problems. The most interesting aspect of ACL is the thinking required to use the software to its fullest.

About ACL

Increasingly both external and internal auditors use auditing software to perform a wide variety of auditing tests. At one time, each of the largest CPA firms developed their own audit software, but over time each decided it was more economically practical to purchase the software from a specialist. The provider of choice has become ACL.

ACL Services Ltd. develops, produces and markets ACL software, and in doing so has become the largest and dominant provider of audit software throughout the world. ACL provides its product to more than 250,000 professionals in thousands of organizations including all four of the largest international CPA firms, many regional and local CPA firms, 98% of Fortune 100 firms, and many governmental and other not-for-profit organizations. As a part of their services, ACL also provides extensive training for existing and potential customers.

Knowledge Needed to Understand the Materials

ACL is an audit tool that is used to solve audit problems. An understanding of basic auditing concepts is needed for the materials to be useful.

It is appropriate to use the materials in a first undergraduate auditing course, but you will learn ACL applications best if it is used in the last half of the course. It can also be used in a second auditing or forensic accounting course at the undergraduate or masters level. The materials are appropriate for use with any auditing or forensic accounting text, and the materials do not reference and texts.

About the Materials

The materials were written to help you learn how to use ACL in an audit setting. The philosophy followed is based on the belief that you will learn ACL best and retain the knowledge longest by using the software, with frequent repetition of key features.

The first seven chapters are intended to help you to learn ACL with emphasis on selecting the appropriate ACL command and using it correctly.

Chapter 1 introduces ACL and provides an explanation and practice loading the software on your computer.

Chapter 2 familiarizes you with the software, including how to access ACL tables and become familiar with ways to interpret and change the appearance of information in tables to meet your needs.

Chapters 3 through 6 provide practice and knowledge about filters and the commands in ACL, including expanded coverage of sampling commands. You are provided guidance, practice and solution for each new command, followed by an additional problem or problems to solve on your own. Knowledge of these chapters will enable you to complete the problems and cases in later chapters.

Chapter 7 teaches creating a new project for an audit and accessing client data files for use by ACL. A wide variety of client data files can be accessed by ACL. Excel, CSV (comma delimited), and Microsoft Access are included in the chapter.

The remaining chapters apply the knowledge you learned about ACL to the three key parts of all audits, as well as forensic auditing and preparing customized reports.

Chapter 8: Using ACL for Audit Planning Five cases, each with a different project and data sets are available to learn how to use ACL to more effectively plan the audit. One case is in three parts and integrates planning with tests of controls, substantive tests of transactions and tests of details of balances.

Chapter 9: Using ACL to Perform Tests of Controls and Substantive Tests of Transactions Four cases, each with a different project and data sets are available to learn how to use ACL to perform tests of controls and substantive tests of transactions.

Chapter 10: Using ACL to Perform Tests of Balances Four cases, each with a different project and data sets are available to select from to learn how to use ACL to more effectively perform tests of details of balances.

Chapter 11: Using ACL for Forensic Auditing Four cases, each with a different project and data sets are available to learn how to use ACL to detect fraud.

Chapter 12: Reports Deals with preparing customized reports, including graphs. It includes four activities to help the students learn the material.



Acknowledgment of ACL

ACL has been more than generous in providing the software for these materials and their time in helping us learn the best uses of ACL. We attended the ACL three-day Introductory ACL for Windows course, which was outstanding. We next attended their two-day Intermediate course, which was equally excellent. Both the materials and instructors in each course were extremely valuable in developing these materials. In addition, Mai Nakane – Product Designer and Jenine Suen – Community Management Specialist, have been extremely helpful in responding to numerous requests and inquiries.

Acknowledgments of Ernst & Young and Deloitte

Deloitte provided a large data set that was used to develop several assignments. We are especially grateful to Mark Sirof for providing the data file and repeated advice on how to make the materials more relevant for students. Mark is extremely knowledgeable about ACL and committed to its use in the firm.

Ernst & Young provided three data sets used in these materials and their ACL entry-level training materials. We are especially grateful to Opher Jackson for the advice he provided several times discussing how EY uses ACL in their practice and their plans for continued use. He was also extremely helpful in providing several data sets beyond the ones used in the materials. Opher has been a leader in the firm in helping them become effective ACL users.

Other Acknowledgments

Mark Zimbelman is a professor at Brigham Young University and is very knowledgeable about fraud auditing and the use of ACL. He provided the data set used for Case 4 in Chapter 11.

Regina Rexrode is responsible for production of the book. Her patience and dedication are greatly appreciated. We are also grateful for outstanding copy editing and proofreading by Patricia Naretta.

Finally, the encouragement and continuing support of family, friends, and associates have contributed in large measure to the completion of this book.

Introduction and Software Installation

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2010 2011 2012 2013 2014

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CHAPTER 1

For the entire project, the following symbol is used to indicate that you are to perform a step using your computer.



Whenever you see this symbol in the left margin, you should complete the related step, which is shown in *italics*. You should not begin doing an activity with your computer until the symbol is shown

Steps for Successful Completion of the Project

TO SUCCESSFULLY ACCESS THE SOFTWARE AND DATA REQUIRED FOR THIS PROJECT, YOU WILL NEED TO CAREFULLY READ AND APPLY THE STEPS DESCRIBED BELOW AND DETAILED IN THE E-MATERIALS PROVIDED ON THE ARMOND DALTON RESOURCES WEBSITE.

- Go to www.armonddaltonresources.com and click on *E-materials*.
- Use the *E-materials* drop-down menu and select *ACL Data Analytics*.
- Follow the instructions in the *E-materials* to register on the Armond Dalton Resources website and then download the *ACL* software and the project data sets.

The screenshot shows the Armond Dalton Resources website. At the top, there's a decorative banner with the text "Better. Cheaper. Faster." and "Yes, you and your students can have it all!". The main navigation bar includes links for "Home", "Publications", and "E-Materials". The "E-Materials" menu is open, displaying a list of available resources:

- QuickBooks Pro 2015 4th edition
- Systems Understanding Aid 9th edition
- Excel-Based Decisions in Managerial Accounting 1st edition
- Integrated Audit Practice Case 6th edition
- Valley Publishing Co. - A Comprehensive Audit Case 12th edition
- Sage 50 2015 4th edition
- ACL Data Analytics 3rd edition
- Systems Understanding Aid 8th edition
- Microsoft Dynamics GP 2016
- Sage 50 Accounting 2017
- ACL Data Analytics 4th Edition

A cursor is hovering over the "Personal Computer E-materials.docx" link at the bottom of the list.

Introduction

ACL Data Analytics is powerful software developed by ACL to perform data verification and analysis on data files and to create reports based on the analysis. Auditors, forensic accountants, information technology specialists, and other accountants use it extensively throughout the world.

The purposes of these materials are to teach auditing students how to use ACL software and to perform a wide variety of auditing tests applying the software. The software is relatively simple to use, but it takes considerable experience to obtain the maximum benefit from ACL. The emphasis throughout the materials is to learn by applying the software to a variety of data files following the guidance provided. Later you will be given cases involving auditing where you will apply the tools you learned earlier in the project.

One of the attractive characteristics of the software is that it is interesting to use. Most students find ACL relatively easy to learn and conclude that it is a valuable tool to be a more efficient and effective auditor. That is why it is so widely used by auditors and others who deal with data files.

Materials Included in the Package

- **Instructions & Assignments Book.** This is the source you should follow for all instructions about what you are to do. The assignments are included on tear-out answer sheets at the end of each chapter and on the Armond Dalton Resources website. Your instructor will tell you which option to use.
- **Reference Book.** The purpose of the Reference book is to provide a source of instructions to perform ACL commands. For users who do not use ACL regularly, it is easy to forget how to perform the steps to complete certain commands. The Reference book will help you quickly identify how to perform the appropriate commands.
- **Quick Reference Guide.** Located inside the front and back covers of the Reference book, the Guides will assist you in deciding the appropriate commands for problems and cases and help you find the appropriate page(s) in the Reference book for detailed steps required.
- **Serial Number to Provide Access to ACL Software and The Armond Dalton Resources website (www.armonddaltonresources.com)** The sticker in the lower-left corner of the Instructions & Assignments book cover includes the one-time-use serial number you will need to access the ACL software, the Armond Dalton data files, and the online homework. The serial number is hidden by a scratch-off sticker.



The ACL software that you will download via a link on the Armond Dalton Resources website is the same software sold by ACL to users throughout the world. The serial number will provide you with six-month access to ACL Data Analytics software. Some of the data files are included with the software provided by ACL, modified only for changes in dates. However, most of the data files have been added by the authors.

Overview of ACL Software

The concept underlying ACL is simple. First, ACL Data Analytics creates a *project* to keep track of information that will be used on an audit. Typically, the project is the name of the audit client. An ACL project is similar to a top-level folder in a Windows directory. For a given project, client data is accessed by ACL through the use of a table layout, which is discussed later. The combination of the table layout and the client's data file is referred to as a table. As the audit proceeds, auditors create tables by accessing the client's data files. ACL tables are used to describe the location, layout, and content of a client's data files. For example, an auditor may want to access all client data files to be used in the audit of Renalds Manufacturing Company in a project file called Renalds.AC1. The auditor accesses client data files to perform verification and analysis through the use of tables. After one or more data files have been accessed by ACL as a table, the underlying data can be viewed, verified and analyzed in a wide variety of ways.

A critical characteristic of ACL is its inability to alter client data files. ACL is read-only software. Clients can therefore be confident that the auditor will never add, delete, or change information in original data files. Similarly, after files are entered into ACL, the auditor cannot delete or change the information. But, the auditor can choose to view only portions of the file or new files can be created to produce additional information or to create a table for only a portion of the original data files. You will be accessing data files using ACL, performing considerable verification and analysis, viewing portions of data files, creating tables, and preparing reports throughout the project.

System Requirements

Before proceeding with the installation, ensure that the computer on which ACL for Windows will be installed meets the requirements outlined below.

THE ACL DATA ANALYTICS SOFTWARE IS NOT COMPATIBLE WITH MAC COMPUTERS.

You may be able to successfully install Windows and use the ACL Data Analytics software if you partition your hard drive by using Bootcamp, which comes installed on MAC computers.

(www.armonddalton.com/support-updates/mac-users/)

Software Requirements

Your computer must have one of the following operating systems installed:

- Microsoft Windows 10 (64-bit)
- Microsoft Windows 8.1 (64-bit)
- Microsoft Windows 7 Service Pack 1 (SP1) (32-bit/64-bit)

ACL for Windows is a 32-bit application that can run on the 64-bit versions of Windows.

To install ACL for Windows on Windows 7, you must have Service Pack 1 installed. ACL for Windows requires Microsoft .NET 4.6.x, which cannot be installed on versions of Windows 7 prior to SP1.

Windows XP is no longer a supported operating system.

Important information for Microsoft Windows 8.1 users:

Windows 8.1 Update KB2919355 is required by Microsoft .NET Framework 4.6.x, which in turn is required by ACL for Windows 12.

If you are using Windows 8.1, and .NET 4.6.x is not installed, and you have not run Update KB2919355, the ACL for Windows installer terminates with an error message during the .NET 4.6.2 prerequisite installation.

You need to download and install Update KB2919355 before you can continue with the ACL for Windows installation.

Alternatively, you can install Update KB2919355 before you begin the ACL for Windows installation and avoid the error message.



Caution

If you are prompted to restart your computer at any point during the installation process, do so right away. Do not ignore messages to restart your computer. If you do not restart your computer when you are prompted, you may compromise the installation of .NET, other prerequisites, or ACL for Windows.

Requirements installed by the ACL for Windows installer

If the following software prerequisites are not already installed on your computer, they are installed by the ACL for Windows installer. If your computer already has .NET 4.6.0 or 4.6.1, ACL for Windows uses the installed version of .NET and does not install version 4.6.2.

- Microsoft .NET Framework 4.6.2
- Microsoft Visual C++ 2015 Redistributable Package, Update 2
- Microsoft Visual C++ 2013 Redistributable Package
- Microsoft Visual C++ 2012 Redistributable Package
- Microsoft Access Database Engine 2010
- Open XML SDK 2.5 for Microsoft Office

Your computer must meet the following hardware requirements

The best ACL Analytics performance in a production environment may require greater resources than the minimum specification.

- Processor: 1.8 GHz
- Memory (RAM): 2 GB (64-bit operating systems: 8 GB or more, especially if sorting large files. 32-bit operating systems: 4 GB, especially if sorting large files).
- Hard disk space (ACL application files): 1.1 GB
- Hard disk space (software prerequisites): 8 GB
- Hard disk space (data storage): 100 GB or more. In addition to the hard disk space required to install ACL application files and prerequisites, significant additional space is required if a computer will be used to store data extracts, flat files, and results.

Internet Connection Requirements

ACL for Windows requires an Internet connection to perform the following functions:

- post-installation, for activating ACL for Windows
- for accessing context-sensitive online help
- periodically required for ongoing software subscription validation
- periodically required for automatic software updates
- provide application-level communication between ACL software components

The specific connections required by the various executable files within ACL for Windows are summarized below.

Application name (executable file)	Required connection	Reason(s) for the connection
ACL Analytics (ACLWin.exe)	https://*.aclgrc.com , port 443	<ul style="list-style-type: none"> ● Initial activation of ACL Analytics ● Ongoing software subscription validation ● Sharing data with ACL GRC
The Analysis App window (ACLscript.exe)	https://*.aclgrc.com , port 443	<ul style="list-style-type: none"> ● Ongoing software subscription validation (if ACLWin.exe is not used) ● Sharing data with ACL GRC
The Analysis App window (aclx.exe)	https://*.aclgrc.com , port 443 localhost (dynamic ports)	<ul style="list-style-type: none"> ● Application-level communication between ACL software components ● Sharing data with ACL GRC
Software update notification (AclUpdate.exe)	https://*.aclgrc.com , port 443	<ul style="list-style-type: none"> ● Automatic notification of software updates

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Familiarization

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2014

2015



Introduction

The purpose of this chapter is to familiarize you with ACL, ACL tables, information in those tables, and ways to access, create, and delete ACL tables. You will also learn how to change the visible content of ACL tables without changing the actual content. As in all chapters, you will become familiar with ACL by using the software to perform and practice a variety of tasks.

Using ACL

Before a user can view or analyze information in ACL, client files must be accessed by ACL as tables. A file is the accumulation of information in a specified format. An example of a file is all sales transactions for a month. These files may be Excel files or in many other formats. After the file is accessed by ACL, it is referred to as a table, not a file. In this project, most data files you will be using have already been accessed as tables. You will practice creating tables from client data files later.

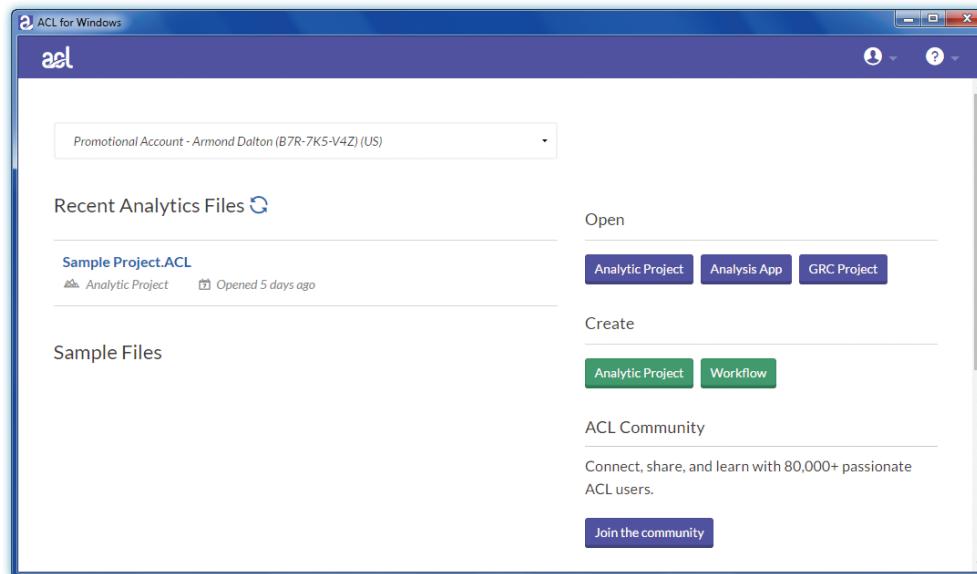
ACL software is designed to permit users to view, verify, manipulate, and analyze data with alternative commands. To keep the project as straightforward as possible for students first using ACL, we have selected commands that we believe will be easiest for you to use and remember. Later, when you use ACL in practice and obtain additional training in ACL you are likely to learn alternative ways to do many of the activities.

Opening an Existing Table in an Existing Project

The first step in any ACL application that was previously set up is to start ACL, then open the project that contains the client data files. To start the ACL program, do the following:

- Either double-click on the ACL for Windows 12 icon on your desktop or click Start → Programs (or All Programs or Apps, depending on your operating system) → ACL for Windows → ACL for Windows 12 to open the program.

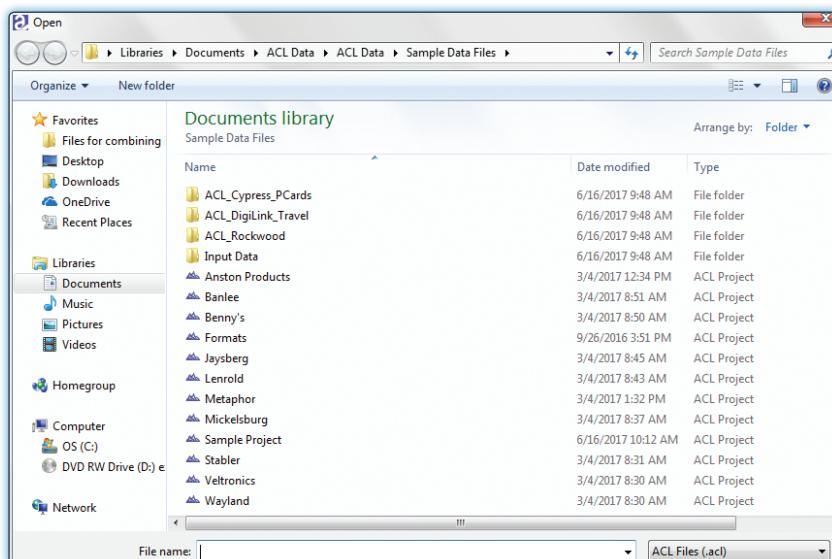
The opening ACL window appears, as shown on the following page.



Observe in the ACL window the words “Recent Analytics Files.” Below that is the list of all projects recently used. Typically, a project is the name of a client. Unless you have worked with the ACL program before, the list of Recent Projects will be blank.

-  Click Analytic Project under Open.

A window showing the Sample Data Files will open as shown below.



-  Select Sample Project, which is the project used in this chapter.
-  Close the ACL program and then reopen the program.

Notice that Sample Project.ACL is now listed under “Recent Analytics Files.” As soon as a project has been opened once, it will appear in the “Recent Analytics Files” section of the ACL window each time you open the program.



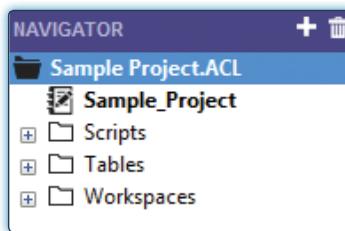
Next, reopen the Sample Project project.

- Double-click on *Sample Project.ACL* in the Recent Analytics Files section of the window. The screen now appears exactly as the one you opened previously. Either way of opening a project is equally acceptable.

After opening the *Sample Project.ACL*, observe that immediately above the name “*Sample Project.ACL*” (on the left side of screen) is the term Navigator. The Navigator has three components: the Overview window, Log, and Variables. The Overview window, which is the default setting, is the index for all folders, subfolders, and tables for a project. The Log is discussed later. Variables is primarily used with scripts, which is a more advanced ACL feature and is not discussed further in this book. You will use the Project Navigator extensively in ACL.

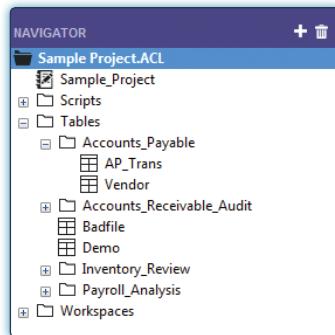
The next step is to open the table you plan to work with.

The *Sample Project.ACL* folder contains three folders: Scripts, Table, and Workspaces as shown below:



Subfolders are optional, but are helpful to divide the project into meaningful audit areas. A subfolder has a folder icon . Next, practice opening a subfolder to reveal the tables that are in the subfolder.

- Either click the plus sign to the left of the *Tables* folder or double-click the *Tables* folder. Notice from the illustration at the top of the next page that there are four additional subfolders within this folder: *Accounts_Payable*, *Accounts_Receivable_Audit*, *Inventory_Review*, and *Payroll_Analysis*.
- Click the plus sign to the left of the *Accounts_Payable* subfolder. Notice from the illustration below that there are two tables within this subfolder: *AP_Trans* and *Vendor*.



A table has a box icon divided into quarter sections with a horizontal bar along the top. (see the icons next to the AP_Trans and Vendor tables). Only a table can be opened.

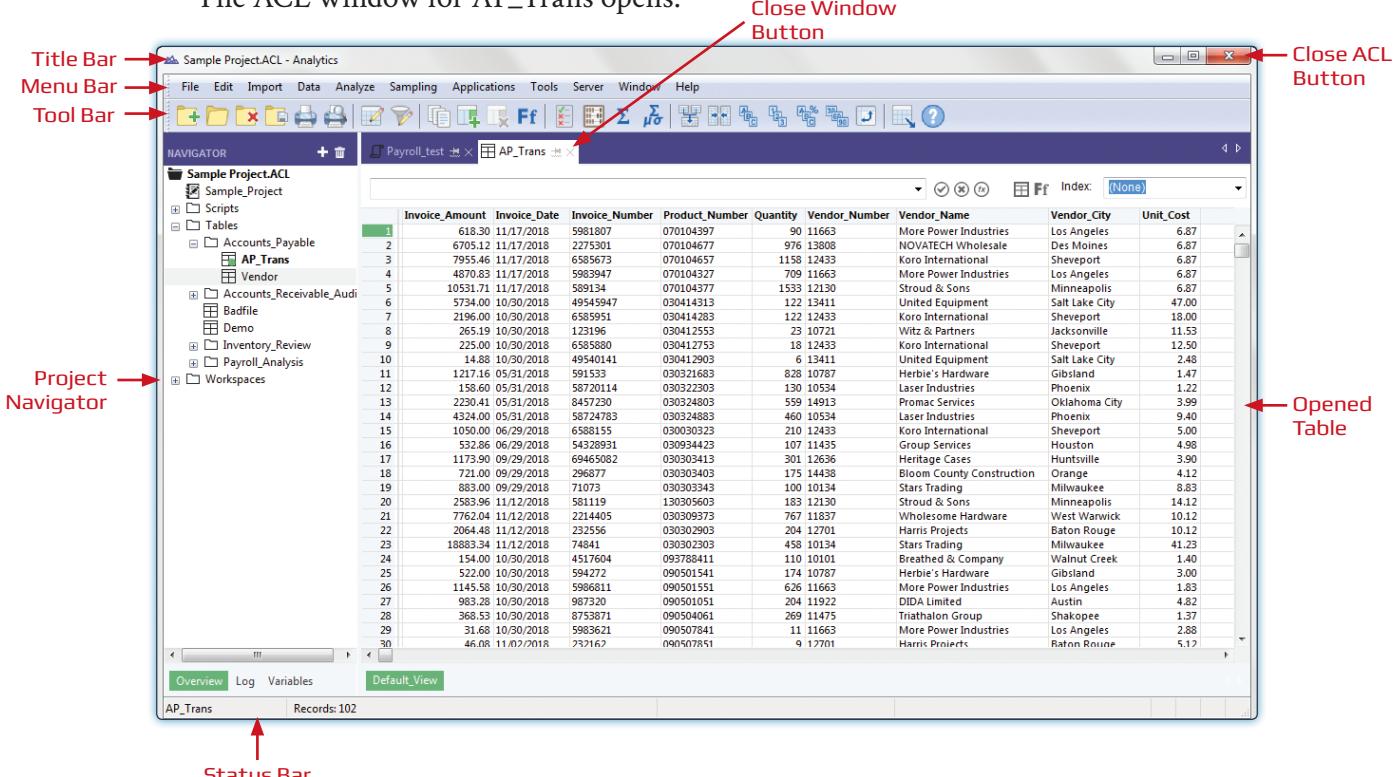
A plus sign next to a folder or subfolder indicates that there is additional information within a folder. A minus sign indicates that all information is shown

- For practice, click the minus sign next to the Accounts_Payable subfolder to hide the two tables from view. Now click the plus sign to reveal the two tables again.

You will now open a table.

- Double-click the icon next to the table called AP_Trans to open the table. Notice that a green dot now appears next to the AP_Trans table icon. ACL uses a green dot to show which table is currently open.

The ACL window for AP_Trans opens.





The window on your screen should now look the same as the one in the preceding figure except for the titles outside of the window. If it doesn't, change the window size by using the maximize button. You can also expand or reduce the size of the window by moving the cursor to an edge of the window, clicking on the edge and dragging it to a different location, just like for any other Microsoft operating system window.

Information in a Window with an Open Table

Following is information that you should observe on the screen with the AP_Trans window open. The preceding window highlights the information.

- **Title Bar** – Shows that you are in ACL.
- **Menu Bar** – Is similar to other Windows applications but has different titles. The menu bar is used extensively throughout these materials.
- **Tool Bar** – Has several icons, which ACL calls buttons. Buttons are a convenient way to access commands. You will learn those later. Alternative ways of doing the same commands are also shown later. If the tool bar is not visible, select *Window → Tool bar on the Menu Bar*.
- **Close Window Button** (at the right of the table window to the right of the project Navigator) – Closes the table. If you click the top right close button, it closes ACL.
- **Status Bar** (at the bottom of the window) – Displays information that relates to your activities and status in ACL. The status bar shows the name of the table that is open and the record count of the current table. That information is helpful to show that you are in the intended table.
- **Project Navigator** – Shows the organization and activity of the current ACL project. The Project Navigator section has three tabs: Overview, Log, and Variables.
 1. **Overview tab** – Used to display folders, subfolders, and tables. When a project is first opened the default tab is the Overview window. Initially, the Overview window shows only folders, which are used to hold all items that belong to the current project, including subfolders and tables. The Overview window is also used to open tables. Only one table can be opened at a time. The name of the current ACL project is shown at the top of the Overview window.
 2. **Log tab** – Used to display the current command log. The command log records and displays the ACL commands and results obtained during a data analysis project. The information in the command log is useful for documentation and retrieving data. You will use the command log later.

3. **Variables tab**—A variable is temporary storage location used to hold a value and often used with the ACLScript function. This advanced feature of ACL is not discussed further in this book.

- **Opened Table**—Includes **fields and records**. A portion of the table from page 2-5 is included below.

	Invoice_Amount	Invoice_Date	Invoice_Number	Product_Number	Quantity	Vendor_Number	Vendor_Name	Vendor_City	Unit_Cost
1	618.30	11/17/2018	5981807	070104397	90	11663	More Power Industries	Los Angeles	6.87
2	6705.12	11/17/2018	2275301	070104677	976	13808	NOVATECH Wholesale	Des Moines	6.87
3	7955.46	11/17/2018	6585673	070104657	1158	12433	Koro International	Shevport	6.87
4	4870.83	11/17/2018	5983947	070104327	709	11663	More Power Industries	Los Angeles	6.87
5	10531.71	11/17/2018	589134	070104377	1533	12130	Stroud & Sons	Minneapolis	6.87
6	5734.00	10/30/2018	49545947	030414313	122	13411	United Equipment	Salt Lake City	47.00
7	2196.00	10/30/2018	6585951	030414283	122	12433	Koro International	Shevport	18.00
8	265.19	10/30/2018	123196	030412553	23	10721	Witz & Partners	Jacksonville	11.53
9	225.00	10/30/2018	6585880	030412753	18	12433	Koro International	Shevport	12.50
10	14.88	10/30/2018	49540141	030412903	6	13411	United Equipment	Salt Lake City	2.48

1. **Fields**—Description of types of information in the data file. The current table view has nine fields: Invoice_Amount, Invoice_Date, Invoice_Number, Product_Number, Quantity, Vendor_Number, Vendor_Name, Vendor_City, and Unit_Cost. **Note:** Use the scroll bar at the bottom of the screen to view all of the fields in the current table view.
2. **Records**—Sub-units of a table that includes information for each of the fields. The open window shows 20–40 records, depending on the size of your computer screen. Observe by examining the Status Bar that there are 102 records in the AP_Trans table. Note: Use the scroll bar on the right side of the screen to view all 102 records.

Table Layout

❑ ACL tables are the result of accessing client data files. An ACL table includes the same information as the data file from which it originated. Tables are critical to ACL because they are used extensively in the audit after the client's data files are accessed.

Starting now, a way to indicate that a subfolder and table are to be opened is introduced. This method is used throughout the rest of the materials.

❑ Indicates that a subfolder is to be opened. Open it either by clicking the plus sign to the left of the subfolder or double-clicking the subfolder. For example, Inventory_Review means to open the Inventory_Review subfolder. Inventory means to open the Inventory table.

CHAPTER 2

-   Tables
-   Inventory_Review
-   Inventory

 Click Edit → Table Layout to open the Table Layout window for the Inventory table. The following window should appear:

Table Layout - Inventory [C:\Users\Carol\Documents\ACL Data\Sample Data Files\Inventory.fil]						
		Table Layout Options		Edit Fields/Expressions		Add a New Data Filter
All fields		Name	Title	Start	Category	Length
Product_Number	Product_Number	Product_Number	1	C	9	0
Product_Class	Product_Class	Product_Class	10	C	2	0
Location	Location	Location	12	C	2	0
Product_Description	Product_Description	Product_Description	14	C	24	0
Product_Status	Product_Status	Product_Status	38	C	1	0
Unit_Cost	Unit_Cost	Unit_Cost	39	N	5	2
Cost_Date	Cost_Date	Cost_Date	44	D	19	0
<hr/>						
ASCII10.....20.....30.....40.....50.....60.....70.....80.....90.....100.....110.....					
1	0701043470706LATEX SEMI-GLOSS ORANGE A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:00870	980	5000	5976.9 8691.3
2	0701043970706LATEX SEMI-GLOSS CARAMEL A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:00460	985	5000	3160.2 4595.4
3	0701041770706LATEX SEMI-GLOSS LILAC A-6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:001480	750	0	-10167.614785.2
4	0701046770706LATEX SEMI-GLOSS AFRICAN A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:001290	780	0	8862.3 12887.1
5	0701046570706LATEX SEMI-GLOSS FINA A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:001500	420	0	10305 14985
6	0701043270706LATEX SEMI-GLOSS YELLOW A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:002420	430	0	16625.4 24175.8
7	0701043770706LATEX SEMI-GLOSS GREEN A6.87	2018-10-10 00:00:009.99	2018-10-18 00:00:001870	670	0	12846.9 18681.3
8	0304143130303METRIC TOOL SET 3/8" DR A47	2018-09-30 00:00:0059.98	2018-12-31 00:00:00130	140	400	6110 7797.4
9	0304142830303METRIC SOCKET SET 11 PCA18	2018-09-30 00:00:0025.98	2018-12-31 00:00:00612	450	0	11016 15899.76
10	03041255303036 FC OPEN END WRENCH SET A11.532018-09-30 00:00:0015.98	2018-12-31 00:00:00700	650	0	8071 11186	
11	03041275303036 FC BOX END WRENCH SET A12.5	2018-09-30 00:00:0018.49	2018-12-31 00:00:00248	250	400	3100 4585.52
12	03041290303038 FC METRIC HEX KEYS A2.48	2018-09-30 00:00:003.49	2018-12-31 00:00:00248	300	400	615.04 865.52
13	0342550303030PARKER PROFANE KIT (TFC)U8.4	2018-03-30 00:00:0014.98	2018-05-01 00:00:0001	75	200	0 0
14	0303641630303TAPE & DIA SET 41 PIECESA49.6	2018-03-30 00:00:0069.98	2018-05-01 00:00:0012	650	1200	-595.2 -839.76
15	0303216630303SCREW DRIVER 1/8 X 4 SL A0.73	2018-03-30 00:00:001.69	2018-05-01 00:00:001478	15000	0	1078.94 2497.82
16	0303216830303SCREW DRIVER 1/4 X 6 SL A1.47	2018-03-30 00:00:002.59	2018-05-01 00:00:001248	13000	0	1834.56 3232.32
17	0303223030303SCREW DRIVER NC.3 PHILL A1.22	2018-03-30 00:00:002.29	2018-05-01 00:00:00587	600	1200	716.14 1344.23
18	0303248030303ARC JOINT PLIERS 6"	A3.99	2018-03-30 00:00:004.69	2018-05-01 00:00:00625	150	0
19	03032483030303ARC JOINT PLIERS 16"	A9.4	2018-03-30 00:00:0014.98	2018-05-01 00:00:00875	140	0
20	03003032303031LONG NOSE PLIERS 7"	B5	2018-05-10 00:00:006.98	2018-05-30 00:00:00412	300	0
21	0309344230304DIAGONAL CUTTING PLIERS A4.98	2018-05-10 00:00:007.79	2018-05-30 00:00:00624	500	0	2107.52 4860.96

The items in the Inventory table layout window show information that could not be seen in the display area of the main window for the table. It shows important information about the table, including the following:

- The short and full name of each field (columns 1 and 2). Scroll down using the scroll bar and observe that there are 14 fields for this table.
- The starting point for each field (column 3).
- The three kinds of data fields commonly used in ACL (column 4). These are:
 1. **Character fields (C).** These are used for fields with numbers, letters, or symbols where no calculations are intended. In the Inventory table, these include such fields as product class and product description. Document numbers are also usually classified as character fields, even though the information is in numeric form. Field definitions are covered in more detail in Chapter 7, but character fields will normally be defined as "ASCII."



2. **Numeric fields (N).** These are used for fields for which the auditor intends to make calculations. In the Inventory table, a numeric field is used for such things as unit cost and quantity on hand. The auditor is likely to want to use ACL to calculate the unit cost times the quantity on hand for comparison to the inventory value included in the file. Numeric fields will normally be defined as PRINT in the Table Layout window.
3. **Date fields (D).** These fields are used for all dates. There are two in the Inventory table: cost date and price date. Date fields will normally be defined as DATETIME in the Table Layout window.
 - The length of each field in bytes (column 5).
 - The number of decimal places in each numeric field (column 6). When you examine the fields it is easy to understand why there are only four with decimal points. Because each deals with financial amounts, you expect two decimal points for cents.

 While you are still in the Table Layout window, click on the Type column heading at the top of the window. Observe that the sorting changes the order of the fields listed so that similar field types are listed together.

 Practice clicking the different column headings and notice that the sorting changes accordingly.

 Click the Start column so that the order is now shown in physical order.

 Close the Table Layout window by clicking the  in the top-right corner of the window.

Accessing Commands

The most important way to verify and analyze information in ACL is with commands. Each command opens a command dialog that enables you to perform tasks.

You will learn and practice commands in Chapters 3 through 6. For now, the following is an introduction to commands and related issues.

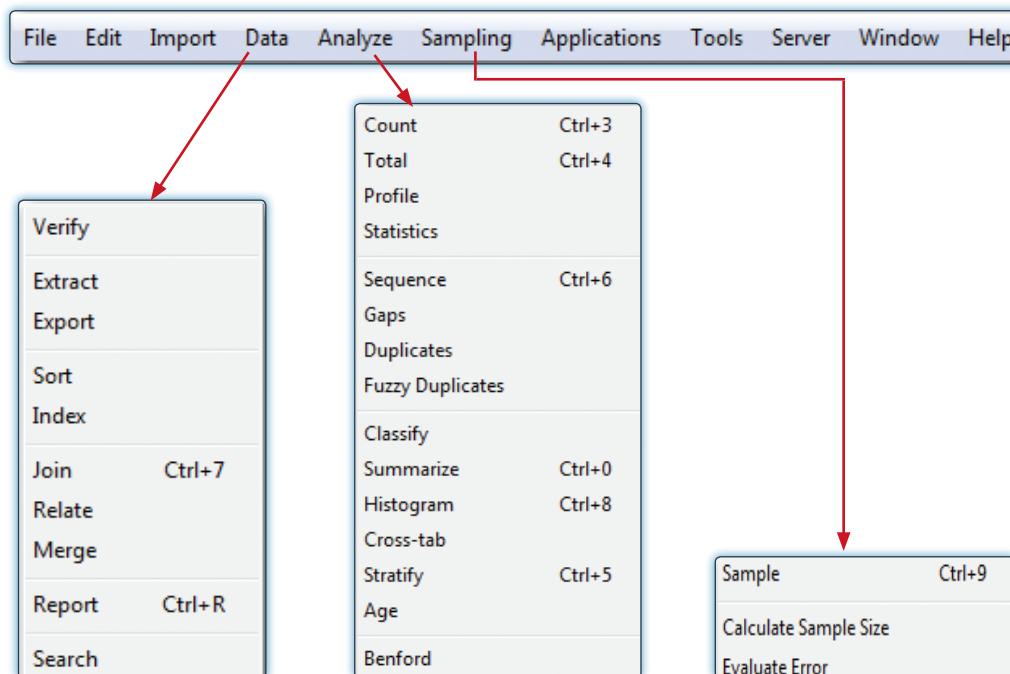
-   *Tables*
-   *Accounts_Payable*
-   *AP_Trans*



CHAPTER 2

Accessing Commands Using the Menu Bar

All menu bar commands are accessed by one of three titles: Data, Analyze, or Sampling. The menu bar descriptions and related commands are shown below. The commands used in these materials are shaded.



- Click **Analyze** → **Total** to open the **Total** command dialog.
- Close the **Total Fields** command dialog by clicking on the **X** in the top-right corner of the box.

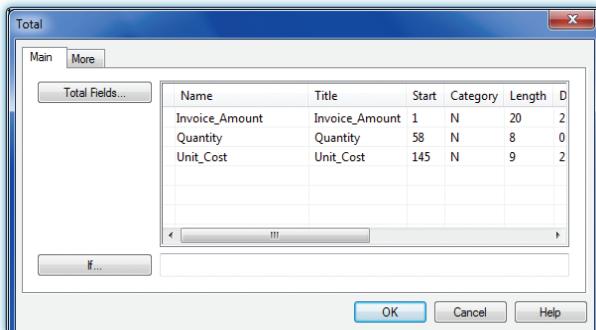
Accessing Commands Using Buttons

Clicking the buttons on the tool bar can also access many of the commands used in these materials. Some of the commands must be accessed through the menu bar (Duplicates, Extract, Gaps, Sample, Sequence, and Sort). All buttons used in these materials to access commands are shown below in alphabetical order from left to right.



- Put the cursor on one of the buttons without clicking on it. Observe the name. Do the same with other buttons and observe that the Quick Reference Guide included in the front cover of your Reference Book includes these same buttons with the command names. Keep the Reference Book available if you plan to use buttons to access commands.

- Σ Click the Total button to open the Total command dialog. The command dialog is exactly the same as the one you opened previously.



You may need to widen the Name column portion of the window if you cannot see all of the field names. To reveal the full names of the fields, do the following:

- Move the cursor to the area between the Name and Title headings until the cursor turns into a vertical line with a horizontal arrow across it. Click and hold the left mouse button down. Move the mouse to the right to widen the Name column until you can see all the field names. For most computers, you can also double-click when the cursor turns into a vertical line with a horizontal arrow to automatically widen the column to make the longest item visible.
- Close the Total window.

Initiate commands by using either the menu bar or buttons on the tool bar. Choose the method you prefer. Buttons are not available for some commands, such as Gaps and Duplicates.

Command Dialogs and Tabs

- Click Analyze → Duplicates to open the Duplicates command dialog. The name of the command is included at the top of the command dialog. Most command dialogs include three tabs: Main tab, More tab, and Output tab.

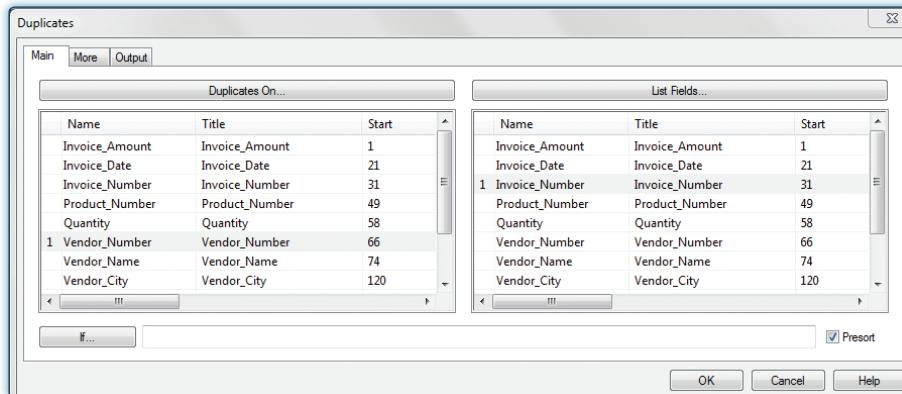


Main tab The Main tab is open when a command is first executed. Information on the main tab varies considerably from tab to tab.

- Click on Vendor_Number in the Duplicates On box (scroll down if necessary) and Invoice_Number in the List Fields box.

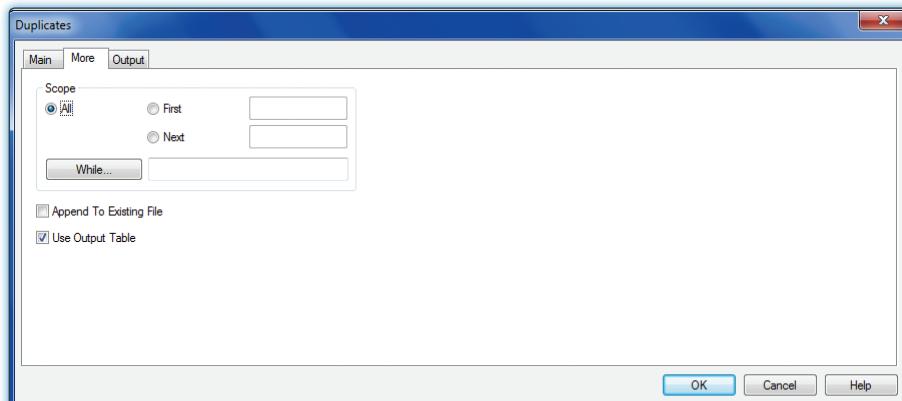


See the completed window in the following illustration. Don't be concerned for now about the meaning of the command.



More tab

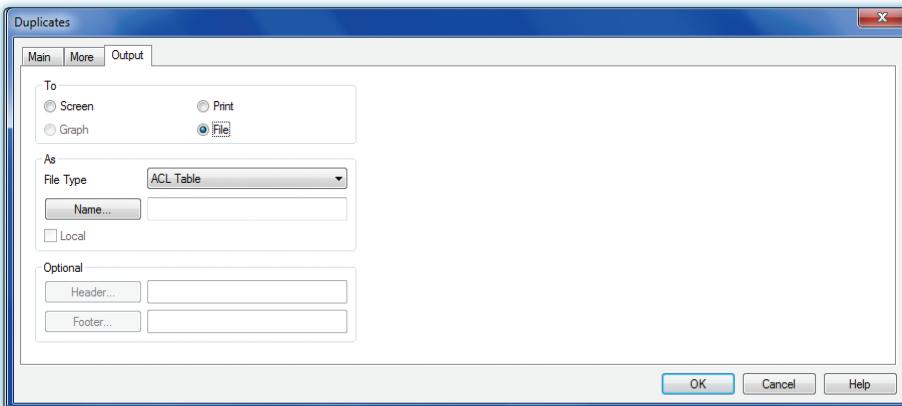
 Click the More tab.



The More tab is similar for all windows. For almost all activities in these materials, the default setting of "All" is appropriate. You will be told if any changes need to be made in the More tab.

Output tab

 Click the Output tab.



The Output tab is similar for all windows, and it is used frequently throughout the materials. The purpose of the Output tab is to allow you to specify where to send the results of a command. For these materials there are four options:

- Display on the screen
- Send to the printer
- Create a graph of the command results (not available for all commands)
- Save in a new file. When you save to a file, you are creating a new table.

The default option for most, but not all, commands, is to display the output on the screen. To change to a different form of output than the one already marked, click the appropriate radio button. For output saved to a file, you must specify a name for the new file.

-  Click the Screen radio button to change the output to the screen.
-  Click the Main tab to return to the Main window without changing the default setting.
-  Click OK to run the Duplicates command. The first 10 records in your screen will look like the following results.

Duplicates:	
Vendor_Number	Invoice_Number
10025	234056
10025	230592
10025	239215
10025	237936
10025	232195
10101	4517604
10101	4514742
10101	4516050
10134	71073
10134	74841

Navigating Information

You should have just completed the Duplicates command for Vendor_Number on the AP_Trans table. If you have not done so, redo that command now.

As you work with ACL in this project, you will need to return to previous activities quickly. The portion of the ACL window illustrated next is an efficient way to do so.



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Your screen should indicate the same information:



There are three buttons that are helpful for you to understand.

1. Returns you to the table you had opened previously. Note: This illustration is for the AP_Trans table that you just worked with. The table name will reflect whatever table is currently open.

Click the button. The screen returns to the AP_Trans table.

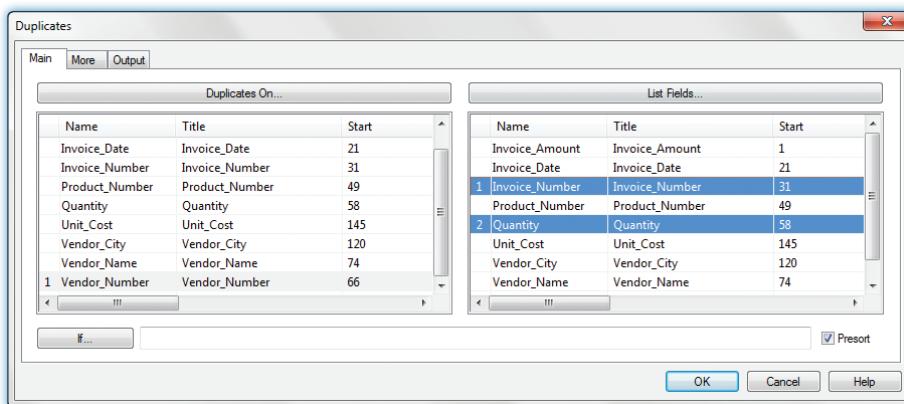
2. Returns you to the command that you last performed. Note: This illustration is for the Duplicates command that you just ran on the AP_Trans table. For other commands, the name of the last command appears next to the blue folder in place of the word "Duplicates".

Click the button. Note: Do not click on the pushpin to the right of the button, but click on either the blue folder or the command name ("Duplicates", in this case).

3. Closes the current window. **Do not close any windows at this time.**

After running a command, you can change the parameters of the command without starting from scratch. To illustrate this feature, do the following:

- Move the cursor immediately to the right of the word "Command" until the cursor turns into a hand. Double-click on the typed description of the command (DUPLICATES ON Vendor_Number...). This action takes you back to the Duplicates window you used before without generating a new Duplicates command.
- Change the command parameters to list the Quantity field in addition to the Invoice_Number that you previously selected. To do this, hold down the Control key and click on the Quantity field in the List Fields portion of the window. See the following illustration.

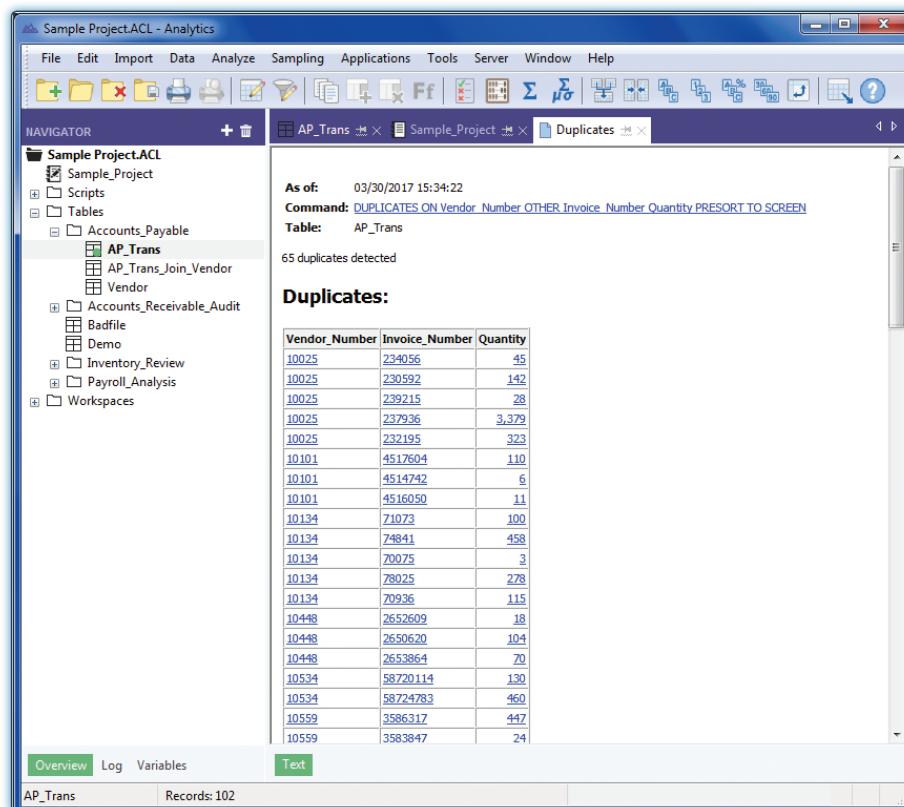


-  Click the Output tab and select the Print radio button. Make sure that your printer is turned on and click on OK.
-  When the print screen appears click on Print to print the results.

The printout should look the same as the earlier screen except now there should be another column with the quantity included. You will have far more records in your printout than the window on page 2-13.

Creating a New Table

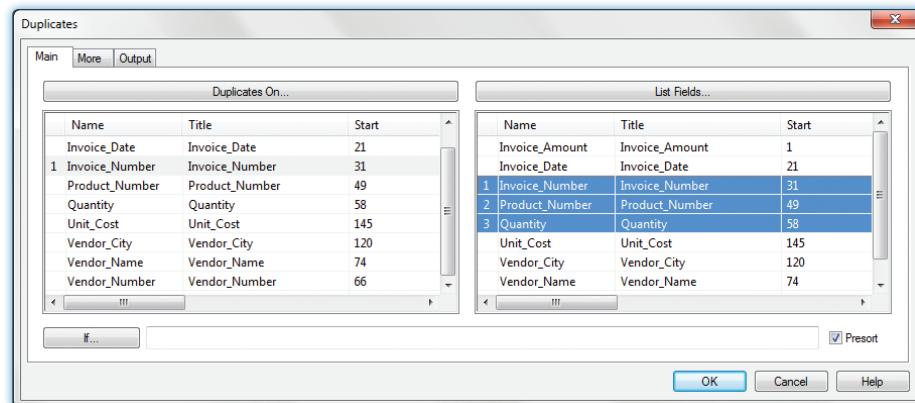
-  If the Duplicates command results are not already on the screen, return to the results by using navigation. The results window should look like the following illustration.



The screenshot shows the 'Sample Project.ACL - Analytics' application window. The 'NAVIGATOR' pane on the left lists project components: Sample_Project, Scripts, Tables, Accounts_Payable (with AP_Trans, AP_Trans_Join_Vendor, Vendor), Accounts_Receivable_Audit, Badfile, Demo, Inventory_Review, Payroll_Analysis, and Workspaces. The 'AP_Trans' table is selected. The main workspace displays the 'Duplicates' results for the 'AP_Trans' table as of 03/30/2017 15:34:22. The command used was 'DUPLICATES ON Vendor Number OTHER Invoice Number Quantity PRESORT TO SCREEN'. The results show 65 duplicates detected, with a detailed list of Vendor_Number, Invoice_Number, and Quantity. The table data is as follows:

Vendor_Number	Invoice_Number	Quantity
10025	234056	45
10025	230592	142
10025	239215	28
10025	237936	3,379
10025	232195	323
10101	4517604	110
10101	4514742	6
10101	4516050	11
10134	71073	100
10134	74841	458
10134	70075	3
10134	78025	278
10134	70936	115
10448	2652609	18
10448	2650620	104
10448	2653864	70
10534	58720114	130
10534	58724783	460
10559	3586317	447
10559	3583847	24

-  Return to the Duplicates command to change the command parameters. Select Invoice_Date in the Duplicates On box instead of Vendor_Number. Change the List Fields box to include Invoice_Number through Quantity. To do this click Invoice_Number, hold down the Shift key and click Quantity. The window on your screen should look like the following window.



When you hold down the Shift key, an entire sequence of numbers is highlighted. When you hold down the Control key, you can highlight columns in the order you select.

- Practice selecting Columns in the Duplicates window by using the Shift key, then the Control key until you feel confident.
- Make sure the Duplicates On and List Fields appear as in the preceding screen before proceeding.
- Click the Output tab and click the File radio button.

When choosing the File output option, you need to type a new table name. The name should be descriptive of what is in the new table so when you need it again the table will be recognizable. For this table a name such as AP_Trans_Duplicates should be sufficient. It is not necessary to include the name of the project since the table will be automatically included in the project where it originated.

- Type the preceding name in the Name box. Be sure to include the underscore marks between the words in the table name.

Throughout the project, you will be typing the names of new projects, subfolders, tables, and fields that you create. ACL will not accept project item names containing blanks or other invalid characters and automatically replaces them with an underscore. ACL encourages users to include an underscore when typing the names of projects, subfolders, tables, and fields. For example, AP_Trans includes an underscore mark. You are expected to follow that ACL convention.

- Click OK to run the Duplicates Command.

Observe that the name of the new table you just created is now listed in the Navigator pane.

- AP_Trans_Duplicates. It should be similar to the table that you executed previously with different duplicates since you used different fields.
- Close the AP_Trans_Duplicates table.

Deleting a Table

It is common in ACL to delete a table, either because it is no longer needed or the user made an error in creating the table and wants to delete it. It is easy to delete a table, but great care must be followed to avoid deleting a table you want to keep. In this project **never** delete a table that was included in the data you downloaded.

To delete a table do the following:

1. Click on the table in the Project Navigator that you want deleted.
2. Right-click, then click Delete. Click Delete when prompted to delete the table.

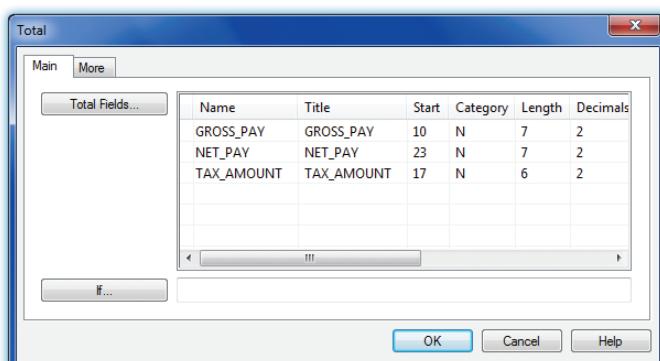
If you delete a table or project that you need for these materials you will need to contact your instructor.

- *Delete the AP_Trans_Duplicates table you just created.*

Command Log

The command log is used to retrieve previously executed commands and their results. To illustrate the command log, do the following:

- *Exit ACL using the uppermost close button in the top right corner. You will now practice opening a table in ACL by first opening ACL.*
- *Open ACL.*
- *Open the Sample Project.*
- *Tables*
- *Payroll_Analysis*
- *Payroll*
- *Click Analyze in the menu bar and then click the Total command. This command totals any numeric fields you select. The Total command dialog should appear as follows:*



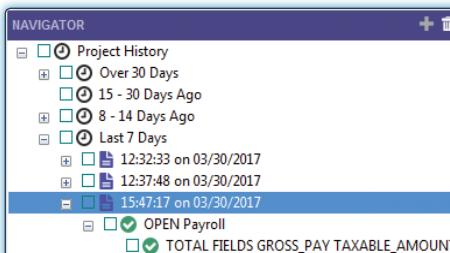


- Hold down the *Control* key and separately click on any portion of the lines containing the following two fields: *Gross_Pay* and *Tax_Amount*.
- Click *OK* to run the command. The following results should appear on your screen:

As of:	06/17/2017 23:01:25
Command:	TOTAL_FIELDS GROSS_PAY TAX_AMOUNT
Table:	Payroll_revised
GROSS_PAY	99,685.46
TAX_AMOUNT	19,922.79

Observe that the screen shows the time and date of your command, the command that you used, the fields you chose, the table, and the command results.

- Close the results window to return to the original table.
- On the bottom-left portion of the screen, click the *Log* tab. After doing so, the Navigator portion of the window appears as shown below. Note: Your command log will likely have different information in it, especially dates, depending on the activities you have done so far in the project.



The command log shows the project history, which is every activity performed for the project, organized by date. As for all Project Navigator activities, a plus sign indicates that there is additional information within a folder or heading.

The command log enables a user to retrieve any command previously performed. It also permits simple documentation to determine tests that the auditor has already performed.

- Double-click on the last item in the Log: The item you should select begins with "TOTAL_FIELDS GROSS..." The screen returns to the Total command results.
- Click the *Overview* tab in the bottom left of the screen to return to the project overview portion of the Navigator.
- Close the results window for the Total command.

Changing Column Widths, Adding, Deleting, and Moving Table Columns

When a table is first opened, the column widths often need to be adjusted so that information can be viewed. First, practice adjusting column widths with the Inventory table. You can make the change similar to any electronic spreadsheet such as Excel, except that ACL does not auto-fit columns to fit the widest entry.

-   Tables
-   Inventory_Review
-   Inventory

After looking at the table, you decide to narrow the width of the following columns: Product_Class, Location, and Product_Status.

-  Move the cursor directly over the line between the Product_Class and Location headings until the cursor turns into a two-sided arrow with a line down the middle of the arrow.
-  Hold the left mouse button down and drag the line to the left to decrease the Product_Class column width. Make sure the column heading and column contents are still visible.
-  Decrease the column widths for the Location and Product_Status columns using the same procedure.
-  Increase the column width of the Product_Description column by a few spaces to make room for new items that may have a longer description than the items currently in the table.

Next, you will practice removing columns from view. Frequently auditors find it convenient to view only columns that are of interest in a table, especially when there are a large number of fields. Assume that the only fields you want to view are Unit_Cost, Quantity_on_Hand, and Inventory_Value_at_Cost. To delete all other columns from the table, do the following:

-  Press the Control key and hold it. Then successively click on the heading of each of the columns other than the preceding three columns.
-  Right-click the mouse in any table cell (NOT a column heading) and left-click on Remove Selected Columns. Click Remove when asked if you want to remove the columns. The only columns remaining should be the three listed previously. If others columns are still in view, repeat the preceding steps until only the three desired columns remain.

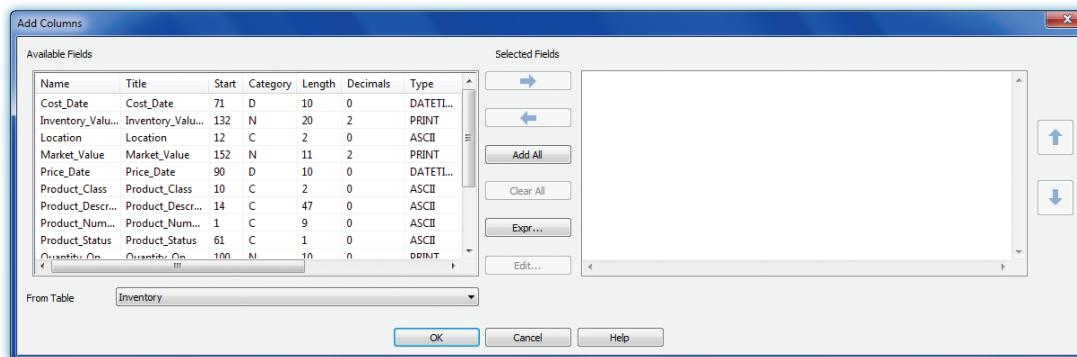
It is also easy to add columns to the view that had previously been removed. First you must decide where you want the column(s) to appear. If you want the new column or columns to appear to the right of all columns that show currently, right-click on any cell in the table and



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select the Add Columns option. If you want it to appear to the left of a certain column, right-click on the heading of that column. Assume first that you want to add the Sales_Price field to the far right of the table.

- Right-click on any cell in the table (not a heading, but any cell).
- Left-click the Add Columns option. See the following window. Do not be concerned if the fields in your window are in a different order.



- Locate the Sales_Price field in the Available Fields portion of the window and double-click on this field to add it to the Selected Fields section of the window.
- Click OK to add the column.

The Sales_Price field now appears on the far right side of all other fields. Next, practice adding fields to the left of the Quantity_on_Hand column.

- Right-click the Quantity_on_Hand column heading so that the entire column is highlighted.
- Left-click the Add Columns menu option. The Add Columns window opens.

Assume you want to add the Product_Number, Product_Description, and Location to the left of the Quantity_on_Hand column, in the order listed.

- Double-click Product_Number in the Available Fields portion of the window. Make sure Product_Number is now included in the Selected Fields portion of the window. Do the same for Product_Description and Location. You can also click once on each item and then click the right arrow button between the Available Fields and Selected Fields boxes. The order they are included determines their placement in the table.

Next, assume that you decide to include only Product_Number and Product_Description.

- Click the Clear All button. Observe that the Selected Fields portion of the window is blank again.
- Add Product_Number and Product_Description to the Selected Fields portion of the window again and click OK.

Note: An alternative method for the previous two steps is to highlight Location in the Selected Fields box and then click the left arrow.

Observe that the columns are now in the table in the order that you wanted (Unit_Cost, Product_Number, Product_Description, Quantity_on_Hand, Inventory_Value_at_Cost, and Sales_Price). You can also click on a column heading and drag the column to move it to the desired location.

-  *Close the Inventory table using the  in the Display area of the main window (not the  at the top of the ACL window, which closes the entire program).*

Because you made changes to the Inventory table, ACL asks if you want to save the changes to the table. For now, assume that you do not want to save the changes.

-  *Click No when asked if you want to save the changes to the Inventory table.*

The display area of the screen returns to the opening ACL window.

Printing

Chapter 12 deals with preparing reports and graphs using ACL. Before that material is covered, you will be asked to print tables, which is different from printing through the Output tab in a command window. It is easy to print tables by one of two ways: Click File → Print, then Click Print. You can also click on the print button  on the top right of the tool bar. Then click Print when the next window opens.

-   *Tables*
-   *Accounts_Payable*
-   *Vendor*
-   *Print the table using the Print button.*

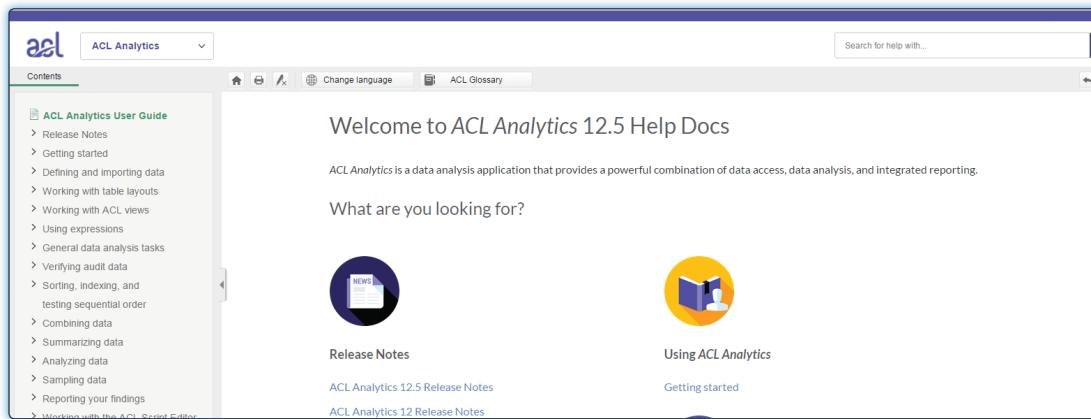
Help Menu and ACL Online User Guide

The guidance provided in this book, as well as the Reference book, should be enough to help you complete all of the requirements in this project. However, if you would like more information about a command or ACL feature that goes beyond the scope of the project, you can use the Help menu to access ACL's online User Guide. The User Guide may also be helpful if you need to resolve errors in running commands. The User Guide provides informative descriptions and detailed steps for all ACL commands and features.



To access the online User Guide, complete the following steps:

- With an open Internet connection, click Help → User Guide. A window similar to the following opens.



The quickest way to find a topic is to enter key words in the search box in the upper-right corner of the User Guide window and then click the search button.

All procedures are now complete for this chapter. Complete any questions and problems on pages 2-23 to 2-25 that are assigned by your instructor before moving to Chapter 3, where you will practice working with various ACL commands.

Name: _____

Tear-out pages for Chapter 2

Remove pages 2-23 through 2-25 now. Answer all questions for the activity command on these pages. Consult your instructor about whether you will submit these tear-out pages in hard copy or whether you use the tear-out pages to enter the answers online at armonddaltonresources.com. For printouts that are to be handed in to your instructor in hard copy, include your name and the question or problem number on the printout before submitting them.

These exercises will help you better understand the material in this chapter. If it is not already open, begin by opening ACL and Sample Project.

-   Tables
-   Payroll_Analysis
-   Empmast

All questions and problems use the Empmast table in Sample Project.

ASSIGNMENTS PART I - QUESTIONS

Q-2-1. How many records are in the Empmast table?

Q-2-2. What is the Commission amount for record 33 in the Empmast table?

Q-2-3. Describe the Empmast's table's Work_Dept field in the following terms:

- Starting point in the table _____
- Type of field _____
 - Character
 - Numeric
 - Datetime
- Length of field in bytes

Q-2-4. What is the total commission amount for all employees included in the Empmast table?

Name: _____

ASSIGNMENTS PART II – PROBLEMS

- P-2-1.** In the Empmast table, why does the Salary field have decimals and the Employee Number field does not?
-
-

- P-2-2.** What is the Project Navigator used for in ACL?
-
-

- P-2-3.** Change the table view of the Empmast table so that the only fields included are the following: Employee_Number, Last_Name, Work_Dept, Job_Desc, Salary, Bonus, Commission, and Pay_Per_Period.

- Narrow the columns and widen the window so that all fields are visible on the screen.
- Move the columns and put them in the following order by clicking and dragging the columns:
 - Work_Dept
 - Last_Name
 - Employee_Number
 - Job_Desc
 - Pay_Per_Period
 - Salary
 - Commission
 - Bonus

- Print the table you have just rearranged.

Bring back the original Empmast table to view without adding, deleting, or changing any columns. **Hint:** Close the table and indicate you don't want to save the changes. Then reopen the table.

- Close ACL.

** Notes **

Use this page to accumulate important notes.

** Notes **

Use this page to accumulate important notes.