GETTING STARTED
Chapter 1: Take your first look at ACL ............................. 1
  Making effective business decisions .................................. 2
  What can I use ACL for? ...................................................... 3
  How does ACL read data? .................................................. 4
  How do I apply ACL to my project? ................................. 5
  Organizing your project items ......................................... 6
  Viewing and modifying your tables .................................... 7
    Changing the columns in a view ..................................... 8
    Adding a computed value as a column ............................ 9
    Adding a computed value as a field ............................... 10
    Sorting a view with Quick Sort ...................................... 11
  Getting answers from your data ...................................... 12
    Choosing the appropriate command ............................... 13
    Running a command .................................................... 14
    Viewing command results ............................................ 15
    Using filters to isolate records of interest ...................... 16
    Applying view filters using Quick Filter ......................... 17
    Searching for records ................................................ 18
    Reviewing the log of your past activities ....................... 19
    Finding help with ACL ................................................. 20

Chapter 2: Plan your project ........................................... 21
  Identifying the project objectives .................................. 22
  Identifying the technical requirements ............................. 23
  Identifying analytical procedures ................................... 24

Chapter 3: Acquire data for your project ........................... 25
  Guidelines for acquiring data ......................................... 26
  Requesting files and layouts ......................................... 27
  Example of a request for data ....................................... 28
  Obtaining data from a server ........................................ 29
  Obtaining data from a PC ............................................. 30

Chapter 4: Access your data ............................................ 31
  Starting a new project in ACL ......................................... 32
Contents

Creating tables to access your data .............................................................. 33
Accessing data with the wizard ................................................................. 34
Accessing data manually ........................................................................... 35
Accessing data through client/server processing ....................................... 36

Chapter 5: Verify the integrity of your data .............................................. 37
Counting records ....................................................................................... 38
Totalling numeric fields ............................................................................. 39
Checking for validity errors ......................................................................... 40

Chapter 6: Analyze your data ................................................................. 41
Summarizing data ....................................................................................... 42
Producing a stratified summary .................................................................. 43
Producing aged summaries ......................................................................... 44
Classifying records by a character field ...................................................... 45
Summarizing on character fields .................................................................. 46
Cross-tabulating character fields .................................................................. 47
Examining sequential data .......................................................................... 48
Testing the sequential order of records ...................................................... 49
Testing for gaps and duplicates in sequential data ....................................... 50
Extracting and exporting records ............................................................... 51
Extracting data to a new table ..................................................................... 52
Exporting data to another application .......................................................... 53
Sorting and indexing tables ......................................................................... 54
Surveying your data ..................................................................................... 55
Generating descriptive statistics on numeric fields .................................... 56
Generating summary statistics on numeric fields ....................................... 57
Performing Benford digital analysis ............................................................ 58
Working with multiple tables ....................................................................... 59
Relating two or more tables ........................................................................ 60
Joining tables ............................................................................................... 61
Merging two tables ....................................................................................... 62
Using Extract-and-append .......................................................................... 63
Adding notes to records .............................................................................. 64
Sampling with ACL ...................................................................................... 65

Chapter 7: Report your findings ............................................................... 67
Using ACL with Crystal Reports ............................................................... 68
Designing and printing reports ................................................................. 69
Graphing data ................................................................. 70
Contents
CHAPTER 1
TAKE YOUR FIRST LOOK AT ACL
Learn how to view your data and find the tools that you need

ACL lets you analyze data in almost any format from almost any platform, and distill meaning from even vast amounts of data.

ACL meets the challenge of analyzing data in several unique ways. Here you will learn about accessing data, key ACL concepts, and the kinds of operations you can use to analyze data with ACL.

In this chapter...
What is ACL?
Applying ACL to your project
Viewing and modifying tables
Choosing commands
Viewing command results
Filtering records
Chapter 1: Take your first look at ACL

Making effective business decisions

Effective decision-making depends on timely access to information. This information may be hidden within vast data files, scattered across multiple databases, or stored in a variety of data types on different platforms. Decision makers and data analysts need tools that can help them access various data types, process large files, and ask intelligent questions about the data.

Data analysis has long depended on statistical methods. While statistics allow us to make useful generalizations about data, they rely on sampling and analyze only a small percentage of the total records. Conventional software, such as a spreadsheet application, analyzes only a limited number of records that have been converted to a form that the application can recognize. Most of the data remains unread.

You need more than a spreadsheet program to analyze data effectively. You need a tool that can read and analyze data in any form, and from any environment. You also need to be able to access data from multiple sources at the same time, and to be free of file-size limitations.
What can I use ACL for?

ACL provides access to virtually any data source, in most cases without advance preparation or conversion. You can readily perform queries and data manipulation on files that would require extensive manual preparation and conversion with other analysis software.

ACL also lets you combine data from dissimilar systems for conversion, reconciliation, and control. It can also be an integral component in systems integration. You can create a common view of data in different files and analyze it as though it existed in one file. In addition, ACL gives you powerful data cleansing and manipulation abilities and flexible reporting options.

Gather essential information for effective decision-making
ACL can analyze even large amounts of data in their entirety. Unlimited file size capability and speed make it possible to analyze millions of records.

Access server data
You can access server data by networking ACL and ACL Server Edition to work in a client/server configuration, or by running ACL Server Edition in offline mode.

Ensure data integrity
ACL has read-only access to source data files. Because you cannot use ACL to alter source data, you can safely use it to access production files directly.

Process any data type
In addition to all of the common database formats, ACL lets you read the immense repositories of COBOL-supported data, and virtually any other “legacy” data in existence.

Process files of any size rapidly
ACL easily analyzes files that are measured in gigabytes. Files that are tens of megabytes in size are processed almost instantly.
How does ACL read data?

ACL uses tables to describe the location, layout, and content of the source data. You create views to display data in your tables. You can create many views for each table.

When you want to work with a new data source, you create a new table by:

- Using the Data Definition Wizard
- Defining data manually

You can always edit the table layout later to add, delete, or modify the fields you want to analyze. You can also copy, link, and share tables among projects.
How do I apply ACL to my project?

With ACL, you can manage your data analysis project from start to finish. In general, a project follows six phases: Plan, Acquire, Access, Verify, Analyze, and Report.

1. Plan your project
   Identify the objective in business and technical terms. Determine the steps necessary to achieve the objectives within the context of the subsequent phases. See Chapter 2: “Plan your project”.

2. Acquire the data
   Gain physical and logical access by identifying the location and the format of the source data that you require. See Chapter 3: “Acquire data for your project”.

3. Access the data with ACL
   Add the data to your project as tables, which define how ACL reads the source data. See Chapter 4: “Access your data”.

4. Verify the integrity of the data
   Ensure that the data does not contain corrupt elements and that the table is properly constructed. Test for uniqueness, data relationships, and reliability. See Chapter 5: “Verify the integrity of your data”.

5. Analyze the data
   Interrogate and manipulate the data to identify exceptions. See Chapter 6: “Analyze your data”.

6. Report your findings
   Prepare the results for formal presentation. See Chapter 7: “Report your findings”.

Learn more about the phases of a project
ACL Help is organized to help you follow these project phases. Select Help » Index and look up “phases of a project”.

Getting Started
Chapter 1: Take your first look at ACL

Organizing your project items

A project organizes your data analysis projects. There are several kinds of items associated with an ACL project: tables, views, scripts, indexes, logs, and folders.

In the Project Navigator, use the Overview tab to organize your project items. You can add folders and drag project items with your mouse from one folder to another.

Add your data to the Overview

To access your data with ACL, you create a table using the Data Definition Wizard. Select File » New » Table. To learn more about creating tables, see Chapter 4: "Access your data".

Add folders to the Overview

You can add as many folders as you need to keep your project items organized. Select File » New » Folder.

Add other project items to the Overview

You can create new tables, scripts, and workspaces in the Overview. Select File » New, then choose Table, Script, or Workspace.

View the details for any project item

From the Overview, you can open the properties dialog box for any item and view details such as notes, file information, views, and table indexes. Right-click the item in the Overview and select Properties.
Viewing and modifying your tables

A view is a window that lets you arrange the way that ACL displays a table. You can create many views for each table. Views can contain any or all of the fields in the table, can have the fields arranged in any order, and can be individually formatted without changing other views or the data itself.

If you close a view or open another view, ACL prompts you to save the active view or to discard it.

Open a table’s default view
To open a table, double-click it in the Overview. When you create a table, ACL creates a default view of the table, which displays all defined fields. If you modify the default view, ACL lets you save your changes as a new view.

Switch between views
If you save more than one view for a table, each view has a tab at the bottom of the window. Click a tab to open the corresponding view.
Chapter 1: Take your first look at ACL

Changing the columns in a view

For each table, you can create as many views as you want. You can add and remove columns or modify the appearance, including:

- Width
- Column title
- Display format
- Print options

When you close a view that you changed, ACL prompts you to save the view. You can create a new view by saving it under a different name.

Add columns to the view

Right-click in the view, select Add Columns, and choose fields from the Add Columns dialog box.

Change how a column displays in the view

To modify a column, double-click a column title in the view. You can size a column to the width of its visible display by double-clicking the right side of the column heading.

Manage a table's views

You can add, copy, rename, and delete views in the Table Properties dialog box. In the Overview, right-click the table icon and select Properties.
Adding a computed value as a column

The columns that you add to a view do not necessarily have to display a physical data field in your table. You can add columns that perform a calculation or manipulate field values in other ways, much like a formula in Microsoft Excel.

For example, you can add a column that converts an amount in US dollars to Euros. You can display the converted Euro amounts in a column next to the US dollar amounts for quick reference. The formula that you create to calculate this is called an expression.

To learn how to create computed values, select Help » Index and look up “building expressions.”

A column can display a computed value, such as the conversion of a dollar value to Euros.

Add a computed value as a column

Right-click in the view, select Add Columns, and click Expr. In the Expression box, type your expression (like a formula in Excel). For example, to convert the Amount field from US dollars to Euros, enter Amount * 0.95. This expression multiplies the value of the Amount field by the estimated conversion rate.
Chapter 1: Take your first look at ACL

Adding a computed value as a field

The ability to add computed values to your view is a valuable asset — your views can include calculations and display more information than is recorded in the source data.

As you learn more about using ACL’s commands, however, you may want to perform tests on those computed values. In this situation, save your expression (your “formula”) as a computed field. You can manipulate fields in more ways than computed columns.

For example, if you save the expression \( \text{Amount} \times 0.95 \) as “Amount_in_Euros”, every field list for this table will include “Amount_in_Euros”. You can then run ACL commands on that field.

Add a computed value to your table

Right-click in the view, select Add Columns, and click Expr. In the Expression box, type your expression. In the Save As box, enter a short but descriptive name for the new field and click OK.

Modify your computed fields

Computed fields are saved as part of your table’s layout, which you can modify. Select Edit » Table Layout and double-click the name of the computed field that you want to modify.
Viewing and modifying your tables

Sorting a view with Quick Sort

You can use Quick Sort to sort records on any field. Applicable only to the view, Quick Sort is a temporary means to view your records in ascending or descending order. When you are finished with Quick Sort, you can restore the normal sorting in the view.

Quick Sort applies to the view only and not to commands, which use the sort order of the table. To sort the records in the table, use the Sort command. To index the table by one or more fields, use the Index command.

? To find out how to use the Sort and Index commands, select Help » Index and look up “Sort” or “Index.”

Sort a view by a column using Quick Sort

Right-click the column header and select either Quick Sort Ascending or Quick Sort Descending.

Restore the normal record order

Right-click a column header and select Quick Sort Off.
Chapter 1: Take your first look at ACL

Getting answers from your data

To get answers from your data, you choose the appropriate commands and view the command results. As you work, you can execute commands, filter the records in the view, and review the log of your past activities.

According to the phases of data analysis in “How do I apply ACL to my project?” on page 5, the Planning phase requires you to choose the ACL commands that achieve your stated objectives. “Choosing the appropriate command” on page 13 helps you decide which ACL command best supports the test or operation that you are attempting.

Commands generate results in different formats from which you can choose. The most common, screen and graph, display results in formatted text or as a graph that you can edit for presentations. To learn more about creating graphs, see “Graphing data” on page 70.

You can apply filters to commands and views to help isolate records of interest. Although command filters temporarily exclude certain records, view filters allow you to isolate records and perform tests on those records.

When you complete your analysis, you can return to the command log to review your results. The command log records every step and can be used for reporting and automation.
## Choosing the appropriate command

<table>
<thead>
<tr>
<th>Test or Operation</th>
<th>Explanation</th>
<th>Commands</th>
<th>Appropriate Data Types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Confirmation &amp; Discovery</strong></td>
<td>Acquire general information about your table.</td>
<td>Verify</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Count</td>
<td>Record-based</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Numeric</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistics</td>
<td>Numeric, Date</td>
</tr>
<tr>
<td><strong>Order</strong></td>
<td>Test the records for sequential order. This test is useful as it may show that it is unnecessary to sort or index.</td>
<td>Sequence</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td><strong>Completeness</strong></td>
<td>Verify that all records in a sequence are present. For example, invoice numbers.</td>
<td>Gaps</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td><strong>Uniqueness</strong></td>
<td>Determine whether records have been included more than once. Also determine whether a particular field contains unique values.</td>
<td>Duplicates</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td><strong>Concentration</strong></td>
<td>Determine how many records and how much value is concentrated by time period, value range, or other record identifiers such as location codes.</td>
<td>Stratify</td>
<td>Numeric</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classify</td>
<td>Character</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age</td>
<td>Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cross-tabulate</td>
<td>Character</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summarize</td>
<td>Character, Date</td>
</tr>
<tr>
<td><strong>Reordering</strong></td>
<td>Change the order of the data in the active table or in a new table containing the same data.</td>
<td>Sort</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Index</td>
<td>Character, Numeric, Date</td>
</tr>
<tr>
<td><strong>Multi-table Associations</strong></td>
<td>Associate or combine data from separate tables.</td>
<td>Extract/Append</td>
<td>Record- and Field-based</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Join</td>
<td>Character, Numeric, Date, Logical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relations</td>
<td>Character, Numeric, Date, Logical</td>
</tr>
<tr>
<td><strong>Statistical Sampling</strong></td>
<td>Draw samples from data populations and estimate the magnitude of errors.</td>
<td>Sample</td>
<td>Record-based</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size</td>
<td>Record-based</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaluate</td>
<td>Record-based</td>
</tr>
<tr>
<td><strong>Benford Analysis</strong></td>
<td>Compare the actual distribution of leading digits with the Benford curve.</td>
<td>Benford</td>
<td>Numeric</td>
</tr>
</tbody>
</table>
Running a command

The commands in ACL let you ask questions of your data. When you approach your analysis, refer to “Choosing the appropriate command” on page 13 to help select the most effective test. Each type of test or operation is supported by at least one command.

Once you decide which command will produce the results you need, open the table and select the command from the menu. Command dialog boxes are straightforward and have a consistent layout to help you choose the right command options.

Run a command

Select a command from the Data, Analyze, or Sampling menus. Specify the command options and click OK.

Limit the scope of a command

Most commands let you specify a command filter to limit the scope of the command. The filter tests each record to determine whether it matches your criterion. The command skips records that do not meet the filter criteria. For example, entering \texttt{Amount} \geq 0 ensures that records with negative values in the Amount field are excluded from the command results.

For help with command filters and other scope parameters, select Help » Index and look up “scope parameters.”
Getting answers from your data

Viewing command results

When you execute a command, ACL displays command results on tabs in the display area. Most commands display the results as a formatted table within the Text tab. Some commands also generate a graph, which you can view by clicking the Graph tab.

Retain command results

On the command results tab, click the push-pin icon to display subsequent commands in addition to the current results. Command results are always retained in the command log, whether or not you use the push-pin.

Drill down in the command results

In the first column of the command results, click an entry. ACL sets the active filter to display the matching records in the view.
Chapter 1: Take your first look at ACL

Using filters to isolate records of interest

For large tables, you often need to reduce the number of records to show only the ones that you want. In Excel, you do this by filtering by the contents of a column. In ACL, it is much the same — you filter records in the view.

A filter is a logical expression that you type in the view’s Filter box, such as `Amount < 0`. For each record ACL asks “Is the value of Amount less than zero?” If the answer is yes, then the record remains visible. If not, ACL hides the record from the view.

When a filter is active, all subsequent commands are run on the visible records only.

A logical expression is always evaluated as true/false or yes/no.

Add a filter to the view
In the Filter box, type a logical expression and press Enter.

Add a filter with the help of the Expression Builder
The Expression Builder lets you build expressions by choosing fields, operators, and functions with your mouse. Click the Edit View Filter button.

Create a new table from the visible records
If you want to narrow your analysis to a subset of records, apply a filter to show the records that you need, then use the Extract command to save the records as a new table. See “Extracting data to a new table” on page 52.
Applying view filters using Quick Filter

You can create a filter based on selected fields by using Quick Filter. This method is faster than entering the filter expression, and lets you interact directly with the data in the view. You can use Quick Filter on any data type.

For example, if you examine an accounts receivable table and want to see all of the records for customer number 795401, apply the **Equal** option on the customer number.

The resulting filter, *Customer = '795401'* , displays the records for that customer only. Alternatively, use the **Not Equal** option to exclude the customer’s records from the view.

Create a filter based on a single value

Select a value, then right-click, select **Quick Filter**, and choose the logical operator to use in your filter.

Create a filter based on a range of values

Select a range of records by clicking a cell and dragging the mouse pointer. Right-click, select **Quick Filter**, then choose the logical operator to use in your filter.

To add to an existing filter using Quick Filter

With a filter already applied, select and right-click one or more values in the view. Select **Quick Filter**, choose **AND** or **OR**, and then choose a logical operator.
Chapter 1: Take your first look at ACL

Searching for records

Use the Search command to locate:

- A specified record number
- The first record in a table that meet a specified condition
- The first record in an indexed table that either meets or exceeds a specified key value, where that value is a character string or character-type expression that may include references to fields or variables

Once the record is found, you can choose to perform calculations on it or compare its contents to that of another record.

To learn more about the Search command, select Help » Index and look up “Search command.”

Search for a record

From the menu, select Data » Search.

Use a filter to locate a record

Filters are also quite effective for locating records. To learn more about using filters, select Help » Index and look up “filtering a view.”
Getting answers from your data

Reviewing the log of your past activities

As you work in ACL, the command log keeps a record of your activities. The Log tab displays every session in a chronological view. You can expand and collapse branches of the log to explore the results obtained during your analysis.

From selected log entries, you can also export your analysis to an HTML file, WordPad, a text file, an ACL log file, or the Windows Clipboard to review past results or prepare reports. You can also save selected portions of the log as a script, which you can use to automate future analyses.

View the command log

Click the Log tab to view the log in the Project Navigator. To view the log in the larger results area, double-click the log icon in the Overview.

Label a series of commands for historical purposes

When you start a session, you can give it a descriptive name. When you later review your log, you can easily see the commands in each session, and the descriptive name reminds you of why you performed the commands. To start a new session, select Tools » Add New Session.

Export portions of the command log

Select the check boxes of the sessions and commands that you want to export. Right-click, select Save Selected Items, and choose the file format to which you are saving the log entries.
Chapter 1: Take your first look at ACL

Finding help with ACL

If you need help while using ACL, you can find the answers you need in a number of locations.

- **ACL Help.** This is your complete guide to using ACL. To access ACL Help, select Help » Contents.
- **ACL dialog and window help.** Press F1 in any dialog box or window to get help that is related to what you are doing in ACL.
- **ACL in Practice.** These tutorials introduce you to ACL-related concepts and demonstrate realistic scenarios.
- **The Data Access Guide.** This publication helps you understand the best ways to acquire and define data for use with ACL.
- **Online support.** The support web site provides answers to common questions, tips and tricks, product updates, and more. If you have access to the Internet, go to www.acl.com/supportcenter.
- **Global Help Desk.** Supported users can contact ACL for assistance from one of our support representatives.

Contact the ACL Global Help Desk

<table>
<thead>
<tr>
<th>Region</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Americas</td>
<td>+1-604-669-4997</td>
</tr>
<tr>
<td>Asia and Pacific Rim</td>
<td>+65-6299-33-65</td>
</tr>
<tr>
<td>Europe, Middle East, and Africa</td>
<td>+32-2-642-22-95</td>
</tr>
<tr>
<td>Germany</td>
<td>+49-241-168-46-75</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>+44-845-351-0077</td>
</tr>
<tr>
<td>Australia</td>
<td>1-800-203-879</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0800-449-647</td>
</tr>
</tbody>
</table>

or e-mail us at support@acl.com.
Some would argue that the most important steps in a data analysis project come before you start using ACL. With careful planning, you can clarify your objectives and avoid potential technical pitfalls. The time that you spend to set milestones and identify major objectives can ultimately save valuable time.

In preparation for your data analysis project, you can identify the project objectives, the technical requirements, and the analytical procedures.
Chapter 2: Plan your project

Identifying the project objectives

You can begin your project with a pen and paper as you attempt to write clear, unambiguous statements of your project objectives. As you articulate your specific goals, you may discover that you can bring additional clarity to the process.

You can write several of these objectives, as long as you ensure that your objective statements are specific, rather than general. In your statement, identify both the process to be audited and the information that you expect to uncover. For example, a project objective could be, “Identify vendors charging more than agreed-upon amounts for supplies”. The more specific the statement is, the more easily you can clarify the steps and achieve the objective.

These objectives also influence the technical requirements of the project. If you want to include certain information in the final report, ensure that those data fields are present in the data that you acquire for the project.
Identifying the technical requirements

With your objective statements on hand, you can determine the technical steps that will support you in achieving your objectives. This can be an iterative process, as the technical requirements may depend on the availability of data files or fields.

Your technical assessment usually includes these activities.

Assess the feasibility

Based on your objective statements, which identify the type of information (the input) and the desired result (the output), you can then determine whether the type of analysis is feasible. There may be instances in which there is insufficient data to accomplish your objectives.

Identify the necessary data files

Identify which data files contain the data fields that you need. For example, to compare a vendor’s contractual price with the invoice price, you need files with contractual prices as well as invoices with details of each product. You may need more than one data file to obtain all of the fields you need.

Ensure that you can accommodate the data files

Estimate as closely as you can the approximate size of the data that you are requesting. Consider the medium in which you’ll receive the data and the capacity of your network server or local disk drive.
Identifying analytical procedures

With all the elements in place, you can now plan how to accomplish each objective. This involves specifying the source data, commands, expressions, and variables that will be employed.

Accomplishing an objective may require more than one step, so a detailed, step-by-step approach should be articulated and reviewed prior to beginning. This will help ensure that no unexpected events occur during the processing and that all possible outcomes have been taken into account. This also presents a comprehensive picture that allows you to identify processes that may be performed more efficiently with other functionality.

For example, performing the unit price comparison for the vendor audit example could involve the following steps:

1. Create a relation between the invoice detail table and inventory table with the product number as the key field.
2. Create a computed field that reveals the percentage of overpricing for each product in the invoice table compared to the standard unit price.
3. Run the Statistics command on this field for general information on the characteristics of the overpricing percentage.
4. Create a computed field that reveals the total dollar value of the overpricing for each transaction.
5. Run the Statistics command on this field for general information on the characteristics of the overpricing.
6. Run the Classify command on the vendor number accumulating this field to determine the distribution of the overpricing by vendor.
Depending on the analysis that you intend to perform, you may have to rely on others to provide the data that you need.

The source data can be on a mainframe computer, a minicomputer, or a personal computer. It can have any record structure, a variety of data types, and can be on hard disk, floppy disk, or other storage devices that can be read by your personal computer.

In addition, with ACL Server Edition, organizations can take advantage of the a client/server environment that provides direct access to server data through a network connection.

Obtaining the data that you need may require some planning on your part. You may need the assistance or permission of others to access certain data, especially if it is on a mainframe computer system.
Chapter 3: Acquire data for your project

**Guidelines for acquiring data**

Regardless of how you obtain data, the following guidelines apply:

- **Request your data as either ODBC or a flat file.** Although ODBC is the preferred method for accessing data, the next best alternative is a flat, sequential file. If your data is in a relational database, convert it to a flat file before you download your data. If you have an information systems department, ask them to assist you. You can also use ODBC to read a relational database. Alternatively, rather than flattening the database, you might want to generate a report from the data and use ACL to analyze the print-image file.

- **Use raw data.** ACL is compatible with all major mainframe and minicomputer data types, and reads EBCDIC.

- **Request a copy of the data.** Request a copy, not a backup, of the original tape file. The only way you can use a backup file is to first restore the data to a regular file, and then make a copy of the file to use with ACL.

- **Request a file description or layout.** The more details you have about the file, including its contents and organization, the better. Having this information makes it simpler to define the data.
**Requesting files and layouts**

To obtain the files and layouts that you need for your project, make a comprehensive request for data. If you provide the detail outlined here in your data request, you can help ensure that all points have been covered.

File layouts that you receive should contain the following information:
- Name of the data file
- Record length
- Field name
- Field start position
- Field length
- Field type
- Field format
- Field description

This information assists you in creating the table for each data file.

A good question to ask your data provider is “What is the easiest format for you to deliver?” Not only will this expedite your request, but it will also establish that you are taking into consideration the opinions and recommendations of the IS team.

*Using ODBC to access data is among the easiest ways to recreate a database, as ACL can automatically create a table with this method.*
Chapter 3: Acquire data for your project

Example of a request for data

When you make a request to your data provider, you can model your request on this form.

```
Attn: _____________________________
Date: _____________________________
From: _____________________________
File or table requested: ______________
Host system: _______________________
Records from (start date): ___________
To (end date): _______________________
Delivery date: _______________________
Data access mode: ___________________
Data access medium: _________________
Record length: ______________________
Record count: _______________________
```

<table>
<thead>
<tr>
<th>Field name</th>
<th>Start position</th>
<th>Length</th>
<th>Type</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProdNo</td>
<td>1</td>
<td>7</td>
<td>Character</td>
<td></td>
<td>Product number</td>
</tr>
<tr>
<td>ProdDesc</td>
<td>8</td>
<td>20</td>
<td>Character</td>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>UnitPrice</td>
<td>28</td>
<td>6</td>
<td>Numeric</td>
<td>9,999.99</td>
<td>Unit price</td>
</tr>
<tr>
<td>PriceDate</td>
<td>34</td>
<td>10</td>
<td>Date</td>
<td>mm/dd/yy</td>
<td>Price date</td>
</tr>
</tbody>
</table>
Obtaining data from a server

You can use one of these methods to obtain data stored on a server:

- Copy data to a personal computer’s hard disk.
- Consider using the Server Edition, which allows you to access server data in a client/server environment.

For many server types, you can copy data directly from the server to your PC over a network connection. You may need to contact your network administrator to ensure that you have permissions to the server or specific folders on the server.

For mainframe data, the most common means of gaining access to data from a server is by either downloading or terminal emulation. In most cases, the personal computer emulates a terminal. You require software to download data to the personal computer from a mainframe.

You should also remember to leave enough space on your personal computer’s hard disk to store the file being downloaded. In some cases, you will need to leave a significant amount of space.
Chapter 3: Acquire data for your project

■ Obtaining data from a PC

Here are some methods that you can use to obtain data stored on a PC:

- Transfer files to the personal computer on which ACL is installed. You can copy the files to any disk media, such as floppy disks, CDs, or Zip files.
- Install ACL on the personal computer in which the data files are located. Use this method if your data files are extremely large.
Before you work with a new data file, you need to tell ACL how to read and interpret the data it contains. You do this by adding tables to your project in ACL.

A table’s layout describes the structure and content of source data, and specifies where the source data can be found. It describes the data in each field, identifies the fields that you want to analyze, and how to display and print that information. The Data Definition Wizard makes it easy for you to create tables for all common data types.

Before you can create a table, you need to open an existing ACL project or create a new project.
Chapter 4: Access your data

■ Starting a new project in ACL

A project gives you a way to organize your data analysis projects. Items associated with an ACL project include:

- Tables
- Views
- Scripts
- Indexes
- Command logs
- Folders

An ACL project is like a file cabinet: use it to store all related project items, such as tables, views, scripts, indexes, logs, and folders.

Start a new project

Select File » New » Project. It is good practice to keep different analyses in separate ACL projects.

Your next step

You are now ready to access your source data. Do this by adding tables to the project. See “Creating tables to access your data” on page 33.
Creating tables to access your data

For each source of data that you want to analyze, you add a new table to your ACL project.

A table's layout describes the structure and content of source data, and specifies where the source data can be found. It describes the data in each field, identifies the fields that you want to analyze, and how to display and print that information.

The Data Definition Wizard makes it easy for you to create tables for all common data types.

Create a table
Select File » New » Table. ACL opens the Data Definition Wizard to detect and define the source data. For help creating a table, press F1 while using the wizard.

Create a table for any kind of data
Although the wizard can identify a great many types of data, for less common formats, you can create a table manually by editing the table layout. Select Help » Index and look up "manually creating tables".

Find out how to identify and define common data types
The Data Access Guide can help you define many types of data.
Chapter 4: Access your data

Accessing data with the wizard

The Data Definition Wizard guides you through the process of defining the source data and creating a table, so you can begin analyzing the data.

In most cases, you only need to specify the file or database location and select the database table you want to define. You can often accept the wizard’s analysis and click Next all the way to the end.

Step through the wizard

The wizard adapts to the type of data that you define, and skips certain steps when it is appropriate to do so. In each wizard screen, make sure that you provide the correct information before clicking Next.

Use the wizard to turn a print-image file into a table

ACL can read print-image — also called “report files” — that have been generated by other applications. Often reports contain records or fields that span more than one line and have information in headings and other report elements. To find out how to define a print-image file, select Help » Index and look up “creating tables with the wizard.”

Access your data through ODBC

ODBC is an interface that allows access to database applications. With the correct drivers, you can use ACL to take advantage of ODBC data sources. To learn more, select Help » Index and look up “ODBC.”
Creating tables to access your data

Accessing data manually

You can create tables manually, and define the fields one at a time. You do not have to define all of the data fields during one session — you can define only the fields that you need at first, and define additional fields later if you need them.

In the Table Layout window, you can define new fields, create computed fields, and define data filters. Fields that you have already defined are listed in the Edit Fields/Expressions tab.

Continue from the wizard

To define a table manually, select File » New » Table, then choose the Skip to Finish option in the wizard when it comes available. In the Overview, double-click the table to open it, then select Edit » Table Layout.

Change the way in which fields and files are defined

At any time, you can change how a table reads your source data. You can redefine fields and records and define new fields. Select Edit » Table Layout.

Get help while you edit the table layout

The Table Layout window can seem complex the first time you use it. To get help with any screen, press F1.
Chapter 4: Access your data

**Accessing data through client/server processing**

ACL Server Edition introduces a significant advance in access to server data. Client/server computing with ACL provides several advantages:

- ACL reads files directly from the server.
- You can process files on the client or on the server.
- You can access server data through the familiar ACL interface.
- Multiple ACL users can access the server simultaneously.
- You acquire direct access to server processing power.

A client/server configuration distributes processing over two or more computers that are linked by a network. To set up a client/server environment for ACL, you need:

- One or more clients running ACL with the client/server option enabled.
- One or more servers running ACL Server Edition.
- A TCP/IP network connection to link the computers together. The connection can be direct, on a LAN, or by dial-up connection on a WAN.

**Enable client/server in the ACL client**

To establish a client/server connection, you need to configure ACL to act as a client. You do this by enabling the client/server option in ACL and setting up a server profile. To find out how, select Help » Index and look up “Enable Client/Server option”.

**Enable client/server on the server**

Before ACL can connect to a server, you need to configure ACL Server Edition. To learn more about configuring the server, refer to the ACL Server Edition installation guide.
Chapter 5

Verify the Integrity of Your Data

Ensure that your data is complete and valid

One of the first tasks in data analysis is to ensure that you have complete and valid data. Verification is especially important when working with data files that do not contain information about their own record layout.

You can use tests such as counting records, totalling fields, and verifying data to ensure that:

■ Your files contain the correct number of records
■ The numeric totals match the control totals provided by the data owner
■ The fields contain only valid data

In this chapter...
Count command
Total command
Verify command
Chapter 5: Verify the integrity of your data

Counting records

Use the Count command to count the number of records in the active table, or only those that meet a specified filter condition. Each time you use Count, ACL saves the result in the command log and displays it in the status bar.

If you apply a view filter, then Count will show the total number of records in the view.

Count all records in the active table

From the menu, select Analyze » Count Records. Add a command filter if you want and click OK.

Use Count after applying a view filter

Count is useful for determining how many records pass test conditions, such as invoice amounts that are less than zero. Apply a filter to the view before counting the records. To find out how to use view filters, select Help » Index and look up “view filters.”
Totalling numeric fields

Use the Total command to total numeric fields or expressions in the active table.

You can use the Total command to prove the completeness and accuracy of the data and to produce control totals. Total finds the arithmetic sum of the fields or expressions specified.

Obtain a total for a numeric field

From the menu, select Analyze » Total Fields and choose one or more numeric fields to total. Select any additional options and click OK.

Total non-numeric fields

Some character fields, such as invoice numbers, may contain digits. To total this type of data, create a computed field that uses the VALUE( ) function to convert character data to numeric data. To learn more, select Help » Index and look up "VALUE( )".
Chapter 5: Verify the integrity of your data

Checking for validity errors

Use the Verify command to check for data validity errors in the active table. Verify ensures that data in a table conforms to the table layout and reports on any errors encountered.

All defined fields may be analyzed to ensure that the data is consistent with each field’s data type as specified in the data definition. For example, Verify checks that character fields contain only character data and numeric fields contain only numeric data.

As well, ACL checks character fields for unprintable characters and checks numeric fields for improper numeric characters. For example, Verify checks for more than one preceding “+” or “-” sign or more than one decimal point.

From the menu, select Data » Verify. Select the fields that you want to verify and click OK.

Verify fields every time you use a table

You can choose to have ACL verify all existing fields every time you use a table by selecting the Verify Data option in the application Options. Select Tools » Options, click Numeric, and select the Verify Data option.
CHAPTER 6
ANALYZE YOUR DATA

Apply ACL to achieve your objectives

ACL works with one table at a time. You can, however, work with multiple tables in several ways: by appending one table to another, by merging or joining them into a single new table, or by relating tables to one another so they can be analyzed as though they were a single table.

Once the data from multiple tables is related or combined by joining, merging, or appending, the resulting table can be analyzed with any of ACL’s commands.

In this chapter...
- Summarizing data
- Examining sequential data
- Locating and isolating records
- Sorting and indexing
- Relating tables
- Joining, merging, and appending
- Sampling
Chapter 6: Analyze your data

**Summarizing data**

In *ACL* you can combine sorting and summarizing operations. Choose from these commands according to the type of summarizing operation that you want to perform:

- Use **Stratify** to summarize data according to numeric ranges.
- Use **Age** to summarize data according to date ranges.
- Use **Classify** to summarize data according to ranges based on unique values in a single character field.
- Use **Summarize** to produce a summary of the data according to ranges based on multiple character or date fields, and display the results with selected data from associated fields.
- Use **Cross-tabulate** to summarize by setting character fields in rows and columns and accumulating numeric values.
Summarizing data

**Producing a stratified summary**

Use the Stratify command to count the number of records that fall into specified intervals — or *strata* — of numeric field or expression values, and to subtotal one or more fields for each stratum. ACL lists the record count for each stratum in a COUNT column in the command output.

The Stratify command works on unsorted tables and is particularly useful to quickly scan and summarize. Stratify allows you to count the number of records that fall into a specified number of even intervals, and provides totals by stratum for selected numeric fields. Alternatively you can specify the start points for the intervals to create custom intervals of any size.

### Count the number records within specified intervals

- From the menu, select **Analyze > Stratify**. Choose the field on which to stratify, select any additional options if necessary, and click **OK**.

### View the output as a graph

- You can send the command output to a graph. In the **Stratify** dialog box, click the **Output** tab and select **Graph**.

To learn more about the Stratify command, select Help » Index and look up "Stratify command."
Chapter 6: Analyze your data

Producing aged summaries

Use the Age command to produce aged summaries of data. For example, you can evaluate sales trends, look at transaction volumes, and classify invoices by the number of days outstanding from a particular date.

Age counts the number of records in a table and:

- Divides the records into intervals based on date or aging periods.
- Counts the number of records in each interval.
- Subtotals the values of one or more numeric fields for each interval.
- Calculates the percent of the total count and of the total value of a subtotaled field for each interval.

Produce an aged summary

From the menu, select Analyze » Age. Choose the command options and click OK.

Specify the aging periods

In the Aging Periods list, you can specify starting points such as 0, 90, 120, and so on for each aging period, or you can accept the default settings of 0, 30, 60, 90, 120, and 10,000 days.
Classifying records by a character field

Use the Classify command to count the number of records relating to each unique value of a character field and to subtotal specified numeric fields for each of these unique values.

Classify works on unsorted data and is particularly useful to quickly scan and summarize data. You can use Classify in a wide variety of circumstances. For example, Classify can rapidly generate a trial balance from unsorted ledger transactions. Classify can also eliminate the need to perform separate Sort and Summarize operations.

From the menu, select Analyze » Classify. Select a field on which to classify the records, choose any additional options if necessary, and click OK.
Chapter 6: Analyze your data

Summarizing on character fields

Use the Summarize command to generate a record count and numeric field value totals for each distinct value of key character fields in a sorted table.

Summarize allows you to subtotal numeric fields for each distinct value of the key character fields. The number of records belonging to each distinct value is displayed in an ACL-generated field named COUNT. Because it can report on an unlimited number of unique key character field values, Summarize is most effective for large tables.

From the menu, select Analyze » Summarize.

To learn more about the Summarize command, select Help » Index and look up “Summarize command.”

Use Summarize to remove duplicate records

You can use Summarize to remove duplicate records from a table. To do this, specify the character field on which to summarize, do not subtotal any fields, select Other Fields and then select Add All, and send the output to a table. The new table will contain unique records only.
Cross-tabulating character fields

Cross-tabulate lets you analyze character fields by setting them in rows and columns. By cross-tabulating character fields, you can produce various summaries, explore areas of interest, and subtotal numeric fields. You can use Cross-tabulate to send the results to a table, the screen, or a graph.

Cross-tabulate counts the number of records in a table and:

- Counts each row value within each column value.
- Subtotals numeric fields for each row value within each column value.
- Totals the amounts for each column value.

To learn more about Cross-tabulate, select Help » Contents and look up “Cross-tabulate command”.

Cross-tabulate character fields

From the menu, select Analyze » Cross-tabulate. Specify the fields for the rows and a field for the columns. You can also specify numeric fields to subtotal and enter a command filter.

Cross-tabulate to a graph

You can create a graph from the Cross-tabulate command. In the Cross-tabulate dialog box, click the Output tab and select Graph.
Chapter 6: Analyze your data

Examining sequential data

There are three commands for analyzing fields containing sequential data, such as check numbers or dates. These fields can contain numeric or character data.

Because of differences in the command output, use all three commands to provide the greatest analytical insight.
Examining sequential data

Testing the sequential order of records

Use the Sequence command to determine whether key fields in the active table are in sequential order. If a table is sorted on the key field, the Sequence command does not find any errors.

Perform a sequence test
From the menu, select Analyze » Examine Sequence.

Correct a file with sequence errors
You can easily put records in sequential order with the Sort command. See "Sorting and indexing tables" on page 54.
Chapter 6: Analyze your data

Testing for gaps and duplicates in sequential data

Use the Gaps command to detect gaps in the key fields of the active table. If you run the Gaps command on a field that has characters mixed with numbers, for example “A12345”, ACL ignores characters and tests only numbers. For example, if the field in the next record is “B12346”, then ACL would report no gaps as the “A” and “B” in the fields are ignored.

The Duplicates command detects whether key fields in the active table contain duplicates in the sequence.

Test for gaps
From the menu, select Analyze » Look For Gaps.

Test for duplicates
From the menu, select Analyze » Look For Duplicates.
Extracting and exporting records

To help isolate records of interest, you can extract records from your table to a new table and continue your analysis with the new table. ACL can also export records to several file formats that can be used in other applications.

- **Extract** - You can extract the records displayed in a view to create a new table.
- **Export** - You can export the records in the view or all records in a table.
Chapter 6: Analyze your data

Extracting data to a new table

Use the Extract command to create a new table from selected fields or records in the active table. There are various reasons to use Extract to create a subset of a table. For example, you can use Extract before sorting to reduce the table size and processing time. You can also use Extract with filters to isolate unusual items in a separate table for further analysis.

You can extract entire records from the table, including any data stored in undefined gaps in the table layout. You can also extract specified fields from records.

You can apply a command filter to extract only those records that match the filter expression.

The new table contains only those records that match the filter expression — in this case, all records with a negative amount.

Extract records from the active table

From the menu, select Data » Extract Data. Select Record, choose any additional options, and click OK.

Extract fields from the active table

From the menu, select Data » Extract Data. Select Fields, select the fields to extract as well as any additional options, and click OK.

Extract specific records to a new table

To extract specific records, you can either apply a view filter before you use Extract or apply a command filter in the If text box while you use Extract. See “Using filters to isolate records of interest” on page 16.
Exporting data to another application

Export allows you to use ACL as a data conversion tool, reading data from one package and producing an export file in a format readable by another application. For example, you can use Export to produce merge files for bulk mailing. You can also export data to several other file types, including Excel, Access, and XML.

Export provides two ways to export your data:

- Use the Fields option to select fields, create expressions, and choose the field order for the export file.
- Use the View option to export only the fields in the active view in the order in which they are displayed.

Export data to another file format

From the menu, select Data » Export to Other Application. From the Export As list, choose a data format: Delimited text, dBASE III PLUS, Lotus 1-2-3, Microsoft Access 2000, Microsoft Excel, Microsoft Word merge files, Plain text, Windows clipboard, WordPerfect merge files, or XML.

Create a merge file for bulk mailing

You can export information from a customer table to a Microsoft Word or WordPerfect merge file. In the Export dialog box, select name and address fields and choose a merge file format from the Export As list.
Chapter 6: Analyze your data

■ Sorting and indexing tables

Computers process files in sequence, starting with the first record, and many operations can be performed more quickly if the files are first sorted or indexed. Some operations, such as multiple table operations, require data to be sorted or indexed on key fields.

Use the Sort command to sort the active table in ascending or descending order based on specified key fields. Sort creates a new table that has been physically reorganized.

Use the Index command to create an index file that allows direct access to the records of a table in a logical rather than physical order.

![Sorting and Indexing Example]

The result of sorting and indexing appears similar: after sorting, ACL displays the new sorted table; after indexing, ACL displays the same table, but with an index applied.

Sort records in a table
From the menu, select Data » Sort Records. To learn more, click the Help button in the Sort dialog box.

Create an index for a table
From the menu, select Data » Create Index. To learn more, click the Help button in the Index dialog box.

Choose the best way to place records in sequential order
To find out how to decide between Sort and Index, select Help » Index and look up "Sort or Index."
Surveying your data

Use these commands to get an overview of a table in advance of detailed processing. They can quickly highlight abnormalities in the table that you can explore through further analysis.

- **Statistics** provides a more complete overview of the significant properties of a numeric file.
- **Profile** can determine values for the Stratify, Histogram, and Sample commands.
- **Benford** digital analysis identifies anomalies in certain types of data.
Chapter 6: Analyze your data

Generating descriptive statistics on numeric fields

Use the Statistics command to calculate descriptive statistics on numeric fields in the active table.

The Statistics command is frequently used to get an overview of a table before detailed processing. It can quickly highlight abnormalities in the table, which can then establish a direction for your subsequent approach or analysis.

**Calculate statistics on numeric fields**

From the menu, select Analyze » Statistical » Statistics. The results include:

- Range, Positive, Negative, Zeros, Totals, Absolute Value, and the Highest and Lowest values.

**Calculate statistics on date fields**

You can also use the Statistics command on date fields. The results include:

- Range, Positive, Zeros, and the Highest and Lowest values.
Generating summary statistics on numeric fields

Use the Profile command to provide summary statistics on one or more numeric fields in a table.

Profile provides the following information for numeric fields:
- Total value
- Absolute value
- Minimum value
- Maximum value

Use Profile primarily to determine minimum, maximum, absolute, and total field values before issuing the Stratify, Histogram, or Sample commands.

To learn more, select Help » Index and look up “Profile command”.

Generate summary statistics on numeric fields
From the menu, select Analyze » Statistical » Profile.
Chapter 6: Analyze your data

Performing Benford digital analysis

The Benford command allows you to generate digital analysis of numeric data by applying the Benford formula.

This command counts the number of times each leading digit or digit combination occurs in a data set, and compares the actual count to the expected count. The expected count is calculated by using the Benford formula. You can send the command output to a graph.

Digital analysis tools like the Benford command enable auditors and other data analysts to focus on possible anomalies in large data sets. They do not prove that error or fraud exist, but identify items that deserve further study on statistical grounds. Digital analysis complements existing analytical tools and techniques, and should be used in conjunction with them.

Use the Benford command in ACL
From the menu, select Analyze » Perform Benford Analysis.

Find out more about Benford digital analysis
To learn more about digital analysis, see Digital Analysis Using Benford’s Law: Tests & Statistics for Auditors by Mark J. Nigrini, Ph.D., published by Global Audit Publications.
Working with multiple tables

ACL lets you work with data from multiple tables in several ways by using:

- Relations command
- Join command
- Merge command
- Extract-and-append

Any two tables that you relate or join must have an identical character field in common, such as an employee number or an invoice number. This field is called a key field. Key fields must have the same field length, identical contents, and must have the same data structure. ACL’s many functions let you edit fields so you can use them as key fields.
Relating two or more tables

The Relations command allows you to simultaneously access and analyze data from two or more tables. You can analyze the combined data as though it existed in a single table, and add fields from related tables to a view.

Because you are working with data from different tables, you can use Relations to examine expected relationships, and to discover unexpected relationships.

You can create a new table containing the related data fields using the Extract command.

Relate tables

From the menu, select Data » Relate Tables. Add tables to the Relations work area and create relationships by dragging fields from one table to the corresponding field in another table.

Access fields in a related table

After establishing relations, you can access fields from related tables in the view, field selection dialog boxes, and the Expression Builder by using the From Table drop-down list. Fields are displayed in the format relation name.fieldname to show the table from which the fields came.
Joining tables

Use the Join command to combine fields from two tables into a third table.

You typically use Join to match records in a transaction table with those in a master table. You can, for example, match invoice data in an accounts receivable table to data in a master customer table, or you can compare the contents of two table.

Tables to be joined must belong to the same ACL project. Similarly, when you use ACL Server Edition, you can log on to only one server at a time so the tables to be joined must reside on the same server. Consequently, you cannot join a client table to a server table.

For each matching record, you join fields from primary file with fields in secondary file.

Identify the primary and secondary tables

When you join a transaction table and a master table, the transaction table is usually the primary table, and the master table is the secondary table. Carefully identify your primary and secondary tables because results differ if you reverse the tables, depending on the type of join.

Join two tables

From the menu, select Data » Join Data Files.
Merging two tables

Use the Merge command to combine two sorted tables with identical record layouts into a third table. Use this new table for further analysis and reporting with ACL.

For example, you can use Merge to combine two tables with identical record layouts from different time periods, different company branches, and so on.

Merge places the merged output records from both the primary and secondary tables into a third output table. All aspects of the records remain unaltered and the sort sequences are maintained. For each key field value, the records of the primary table are placed before those of the second.

For sorted tables with identical layouts, the Merge command combines the records and maintains the record sorting.

**Merge two tables**

From the menu, select Data » Merge Tables.

**Ensure that your tables are sorted**

To verify that your tables are sorted before you merge them, use the Sequence command. See “Testing the sequential order of records” on page 49.
Working with multiple tables

Using Extract-and-append

As an alternative to the Merge command, use the Extract command with the **Append to Existing Table** option to add records from the active table to the end of another table. Unlike the Merge command, this method can be performed on unsorted files.

For example, if you have monthly tables in which transaction records are sorted by customer number rather than by date, you can append one table to the other. In the resulting table, the records maintain the sort order within each month.

![Diagram of two tables being added together](image)

Use Extract-and-append to add the records from the active table to another table with an identical record layout. The results are not sorted.

**Compare table layouts**

Before you Extract-and-append, verify that the tables have identical layouts.

Select **Window » Show Command Line**. Open a table, enter **DISPLAY** on the command line, then click the push-pin icon on the **Display** tab. Repeat this for the other table and compare the layouts.

**Extract records and append to another table**

Select **Data » Extract Data**. Choose the fields to export or select **Records** to export all records and fields. Click the **To** button to locate the table to which you are appending the records. On the **More** tab, select **Append to Existing File**.
Chapter 6: Analyze your data

Adding notes to records

With the new Record Notes feature, you can attach notes to individual records within ACL tables. These notes can be edited, and can be used to store information for reporting purposes and to share with your team. You can add the RecordNote field to the view, just as you would any other field after you create the first note for that table.

To learn more about how to add or edit record notes in a table and how to extract record notes in ACL, select Help » Index and look up “record notes.”
Sampling with ACL

Sampling with ACL can help you reach a statistically valid conclusion about a data population from a relatively small number of samples. ACL supports two common sampling techniques:

- **Monetary unit sampling** (MUS) uses the absolute value of a field in the record to determine which records are selected. When using a monetary unit base, the likelihood that a given record will be selected is directly proportional to the size of the item, unless that item is affected by top stratum cutoff.

- **Transaction sampling**, also called record sampling, in which the population consists of the number of records. A record base treats each record equally, using a nominal value of 1. This results in a sample that is not biased by being based on the values in a record, so each record has an equal chance of being selected.

You can choose one of these methods to select the items in the sample:

- **Fixed interval** sampling
- **Random interval** sampling, also called cell sampling
- **Random** sampling

You can sample the entire population, a subset of the population, or use filters to perform conditional sampling.

ACL has three commands for statistical sampling:

- **Size** determines statistically appropriate sample sizes and intervals
- **Sample** draws samples from a population
- **Evaluate** determines the effect of errors detected in your samples

**Use the sampling commands effectively**

The theory behind statistical sampling is complex. If you are not familiar with the critical judgements required when performing statistical sampling, we recommend that you consult a statistics specialist before using the Size, Sample, and Evaluate commands.
Chapter 6: Analyze your data
CHAPTER 7

REPORT YOUR FINDINGS

Produce reports and graphs from your data

With ACL, you can generate view-based reports and create graphs from commands and views. ACL also integrates with Crystal Reports®, which lets you present your findings by using Crystal Reports templates.

In this chapter...

Using Crystal Reports
Reporting from a view
Using the Report command
Graphing data
Chapter 7: Report your findings

Using ACL with Crystal Reports

With ACL, you can take advantage of the reporting capabilities of Crystal Reports®.

You can use ACL to update report templates with data from an ACL table. In this way, organizations can standardize reporting by designing and distributing a set of custom templates for use with ACL.

For each table, start a Crystal Reports template with ACL then edit it using the full version of Crystal Reports.

Crystal Reports templates are updated with data from your table.

Design a Crystal Reports template

Open a table and select Data » Crystal Reports » Create Template. Add the fields to the template and save it, then edit the file with the full version of Crystal Reports.

Generate reports based on the custom template

Provided that you have a template that was completed by using Crystal Reports, you can generate reports using ACL. Open the table for which the template was designed and select Data » Crystal Reports » Update Template.

View and print your reports

After you generate a report from a custom template, launch the Crystal Reports viewer by selecting Data » Crystal Reports » View Report.
Designing and printing reports

Reports in ACL are based on views. The report specifications are “saved” as part of the view. For your reports, you create views, format them as reports, and name them in a way that indicates the report’s content.

There are three steps to producing a formatted report: formatting the view, designing the report layout, and printing the report.

Format the view
Display a view and specify the field formatting that you want for the report. This includes display formats, break columns, and options such as suppressing duplicates and zero values. Select Help » Index and look up “formatting views”.

Design the report layout
After formatting the view, select Data » Report and format your report pages. Press F1 in the Report dialog box for help.

Preview and print the report
ACL offers several options for printing your report, including the page setup, margins, numbering, and date and time stamping. To learn more about your printing options, select Help » Index and look up “printing a report”.

? To learn more, select Help » Index and look up “Report command”.

You can also save reports as text or HTML (Hypertext Markup Language) files.

ACL offers several options for printing your report, including the page setup, margins, numbering, and date and time stamping. To learn more about your printing options, select Help » Index and look up “printing a report”.

Getting Started
Chapter 7: Report your findings

Graphing data

Graphs provide a visual overview of a table’s contents. There are several ways to produce graphs in ACL.

After generating a graph, you can then change the graph type, save it as a bitmap file, copy it to the Windows Clipboard, or send it to a printer.

Graph from a view
Select one or more numeric fields in a view and choose Graph Selected Data from the context menu.

Graph from commands
Graph from commands that produce graphable numeric output. Choose the Graph option from the command’s dialog box, or click the Graph tab in the command results.

Graph using the Histogram command
Produce a bar graph of the distribution of records over the values of a field or an expression. Select Analyze » Histogram.
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access 53</td>
<td>Benford command 58</td>
<td>cell sampling 65</td>
</tr>
<tr>
<td>acquiring data</td>
<td></td>
<td>checking validity 40</td>
</tr>
<tr>
<td>from a PC 30</td>
<td></td>
<td>choosing commands 13</td>
</tr>
<tr>
<td>from a server 29</td>
<td></td>
<td>Classify command 45</td>
</tr>
<tr>
<td>guidelines 26</td>
<td></td>
<td>combining tables 59</td>
</tr>
<tr>
<td>Age command 44</td>
<td></td>
<td>command dialog boxes 14</td>
</tr>
<tr>
<td>analytical procedures 24</td>
<td></td>
<td>command filters 14</td>
</tr>
<tr>
<td>Analyze menu 14</td>
<td></td>
<td>commands 19</td>
</tr>
<tr>
<td>Append to Existing File option 63</td>
<td></td>
<td>Age 44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>appropriate data type 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benford 58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>choosing 13</td>
</tr>
<tr>
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<td></td>
<td>Classify 45</td>
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<td>Cross-tabulate 47</td>
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<tr>
<td></td>
<td></td>
<td>Duplicates 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaluate 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Export 53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extract 52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gaps 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>graphs 70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Index 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Join 61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>log 19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Merge 62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>options 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Profile 57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relations 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report 69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>running 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sample 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Search 18</td>
</tr>
<tr>
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<td>Sequence 49</td>
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<td>Size 65</td>
</tr>
<tr>
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<td></td>
<td>Sort 54</td>
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<td></td>
<td>Statistics 56</td>
</tr>
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<td>Stratify 43</td>
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<tr>
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<td>Summarize 46</td>
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<td>Verify 40</td>
</tr>
<tr>
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<td></td>
<td>viewing results 15</td>
</tr>
<tr>
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<td></td>
<td>computed fields 10</td>
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<td>contact numbers 20</td>
</tr>
<tr>
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<td>Count command 38</td>
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<tr>
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<td>Cross-tabulate command 47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crystal Reports 68</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Data Definition Wizard</td>
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<tr>
<td></td>
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<td>creating tables 33</td>
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<tr>
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<td></td>
<td>explained 34</td>
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<td>reading data 4</td>
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<td>Data menu 14</td>
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<tr>
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<td></td>
<td>defining data manually 35</td>
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<tr>
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<td></td>
<td>defining source data 33</td>
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<tr>
<td></td>
<td></td>
<td>descriptive statistics 56</td>
</tr>
<tr>
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<td></td>
<td>digital analysis 58</td>
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<td>display of results 15</td>
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<td>Gaps command 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>generating graphs 70</td>
</tr>
<tr>
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<td>Global Help Desk 20</td>
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<td>Excel 53</td>
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<td>Export command 53</td>
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<td>command log 19</td>
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<td>data 53</td>
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</tr>
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<td>expressions</td>
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<td>logical 16</td>
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<td></td>
<td></td>
<td>Extract command 52</td>
</tr>
<tr>
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<td></td>
<td>Extract-and-Append 63</td>
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<tr>
<td></td>
<td></td>
<td>extracting data 52</td>
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<td>files and layouts 27</td>
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<td>filters</td>
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<td>command filters 14</td>
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<td></td>
<td>Quick Filter 17</td>
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<td>view filters 16</td>
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<tr>
<td></td>
<td></td>
<td>finding records 51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fixed interval sampling 65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>formulas 9, 10</td>
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<td>reports 69</td>
</tr>
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<td>help 20</td>
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<td>from command log 19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reports 69</td>
</tr>
</tbody>
</table>
Index

I
Index command 54
indexing and sorting 54

J
Join command 61
joining tables 61

L
layouts 27
locating records 51
log file 19
Log tab 19
logical expressions 16

M
mail merge 53
manually defining data 35
manuals 20
many-to-many join 61
Merge command 62
merging tables 62
Microsoft Access 53
Microsoft Excel 9, 53
monetary unit sampling 65
multiple tables 59
MUS 65

N
new
column 8, 9
computed field 10
graph 70
project 32
script 6
session 19
table 6, 33
workspace 6
notes 64

O
objectives of the project 22
objects in Overview 6
ODBC

defining 34
requesting data 27
OS/390 29
Overview tab 6

P
phases of a project 5
printing reports 69
Profile command 57
Project Navigator 6
projects
analytical procedures 24
new 32
objectives 22
organizing 6
phases 5
technical requirements 23
Properties dialog box 6
push-pin icon 15

Q
Quick Filter 17
Quick Sort 11

R
random interval sampling 65
record notes 64
records
filtering 16
locating 51
Quick Filter 17
sorting 11, 54
relating tables 60
Relations command 60
Report command 69
reports
Crystal Reports 68
designing and printing 69
requesting data
example 28
files 27
guidelines for 26
server 29
results of commands 15

S
Sample command 65
sampling 65
Sampling menu 14
Search command 18
searching for records 51
Sequence command 49
sequential data 48
server 36
acquiring data 29
in client/server 36
sessions 19
Size command 65
Sort command 54
sorting
records in the view 11
sorting and indexing 54
source data 4, 33
Statistics command 56
Stratify command 43
subset 52
Summarize command 46
summarizing data 42
summary statistics 57
support 20
surveying data 55

T
Table Properties dialog box 8
tables
combining 59
computed fields 10
defined 4
defining 33
filtering 16
joining 61
merging 62
new 33
opening 7
relating 60
viewing 7
tabs in results 15
tabular command results 15
technical requirements 23
technical support 20
templates 68
tests 13
text command results 15
text file 19
Index

thumbtack icon 15
Total command 39
transaction sampling 65

V
validity errors 40
Verify command 40
viewing

command log 19
views
changing columns 8
explained 4
filtering 16
graphing 70
opening 7
Quick Filter 17
reports 69

saving 8
sorting 11

W
wizard 34
WordPad 19