

CASES

AND APPLICATIONS

in

LOTUS®

1-2-3®

RELEASE 5 FOR WINDOWS®

HOLT/KOTTAS/MARX

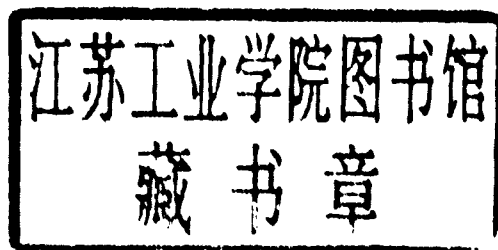
CASES AND APPLICATIONS IN LOTUS[®] 1-2-3[®]

Release 5 for Windows[®]

Jack A. Holt

John F. Kottas

Gretchen Marx



IRWIN

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PREFACE

Thank you for selecting *Cases and Applications in Lotus 1-2-3 Release 5 for Windows* for use in your classroom. It is intended to be used in three ways: as a tutorial guide to the student learning 1-2-3, as a complete pedagogical aid for the instructor and student, and as a reference guide for the student as he or she is completing the exercises and cases for this and subsequent classes.

This book is an outgrowth of our many years of teaching people to use Lotus 1-2-3. We know students learn best through doing and practice. Hence, we strongly believe in the utilization of hands-on tutorials followed by lots of practice with exercises and cases. As in many schools, our students have access to 1-2-3 in computer labs, but they do not have 1-2-3 reference materials. Consequently they need an economical reference guide to 1-2-3. In addition, we know that instructors like to pick and choose the material and exercises that they feel best meet their students' needs and abilities. Not finding a 1-2-3 book that satisfied these needs, Jack Holt decided in 1986 to write a book that did. That original text went through five editions, each time being updated to incorporate the latest changes in the software. This latest version has been completely rewritten to reflect the Windows environment and to take advantage of the many new features available in Lotus for Windows.

Our goal is to help students with little or no spreadsheet experience become confirmed, knowledgeable, and confident 1-2-3 users. The book also describes the general computer terms that are important for all users to understand. We introduce the student to the flexibility of using both the keyboard and mouse to perform Lotus operations. In many years of teaching, we have observed that a major problem for many new and experienced users alike is how to find their files once they have created them, so we have included a chapter on how to perform file operations using File Manager. Again, our goal is to help students become self-sufficient Lotus users, which includes helping them understand the basics of using computers.

More than 40 percent of *Cases and Applications in Lotus 1-2-3 Release 5 for Windows* is tutorials, exercises, and cases. The balance is a reference guide to using 1-2-3 Release 5.0 for Windows. Its guided hands-on examples and tutorials help new 1-2-3 users take important early steps. Reinforcing practice is provided by more than 30 exercises and cases, whose subjects range from accounting and finance to marketing and operations on a difficulty continuum from very easy to very challenging.

In Chapter 1 we seek to provide perspective on the nature of this highly flexible and powerful tool for business analysis and presentation that has brought the microcomputer to the desks of middle and upper management. Chapter 2 helps students without much computer background navigate around what can be intimidating territory in which they must speak what amounts to a foreign language. Chapters 2 to 6 begin the tutorials with a guided overview of many common worksheet functions and are designed to help students use the computer right away. From our experience teaching 1-2-3 in the classroom, we have found that a one-time walk-through of Lotus's features is not sufficient to develop proficiency or mastery of its use. Therefore, all of the material introduced in these chapters is reiterated in more detail in subsequent chapters.

Chapters 7 through 15 provide thorough coverage of fundamental Lotus features, using Bayside Racquet and Fitness Club as the vehicle to present realistic business situations analyzed with Lotus spreadsheets. In addition to financial statements, examples used in the hands-on tutorials in each chapter include membership lists, scheduling, inventory management, and other samples of organizational data. These chapters contain more than 25 hands-on tutorials through which students practice worksheet design, data entry and editing, formatting, styling, and charting. Advanced 1-2-3 features including data tables, database analysis, regression analysis, and macros are covered in Chapters 16 through 20.

Each chapter covers one topic in order to facilitate use of the text as a reference document. It is probable that students will be able to complete the first six chapters independently in one or more visits to the lab. You may wish to review in class and to allocate more hands-on lab time to each of the other chapters, in particular the more advanced chapters toward the end of the text. Boxed hints throughout the text give students special instructions or alert them to a particular feature that is being emphasized in the text. This new edition of the book features screen captures throughout that guide students through the GUI interface, which is at the core of Lotus for Windows.

The last part of the text contains 27 exercises designed to enhance the students' mastery of the material presented in the preceding chapters. The primary topic of each exercise and case is shown in a table at the beginning of the exercises. However, you may choose to assign any of the exercises at any point in the semester after the relevant chapter(s) is covered. The final portion of the text also contains seven business cases that will challenge the students once they have mastered the use of 1-2-3. We encourage you to assign as many of these cases as possible. They represent the type of work students will be required to do in their careers after college and will give them better understanding of how to make use of 1-2-3's capabilities in their other courses of study.

We hope you and your students enjoy this text. It is based on over 70 years of teaching and learning experience. Please feel free to send your comments to us.

Jack A. Holt

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c/o Garret Glanz, Sponsoring Editor

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Anyone who has completed an endeavor such as this knows that it is not possible without the support and encouragement of one's family. Finally, we dedicate this book to our spouses, Jane, Betty, and Ben.

J. A. H.
J. F. K.
G. M.

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CHAPTER 1

Overview of Spreadsheet Analysis and 1-2-3

This chapter describes what a spreadsheet is and gives insight into why this genre of computer software has brought the microcomputer to the desks of managers and professionals. It explains why, since 1983, Lotus® 1-2-3® has been the world's preeminent spreadsheet program. The chapter concludes with a description of the organization and contents of this book. It includes suggestions for working through the tutorials, exercises, and cases.

WHAT IS A SPREADSHEET?

A computer-based spreadsheet is built around a huge, electronic sheet of paper designed to perform mathematical calculations with computer speed. This electronic worksheet has a multitude of columns and rows whose intersections form a matrix of *cells*. This matrix organization has important implications for this visual and easy-to-use, yet flexible and powerful, analytical milieu. Your computer screen provides a movable view of only a small fraction of the cells in the matrix.

In any cell you can enter one of three types of information: a number, a *formula*, or text. A number is the lowest level input that forms the basis for numerical analysis. Cell formulas specify how to compute new values from the values associated with other cells. The values associated with other cells are referenced in terms of the unique column and row designators that identify each cell. A formula can be as simple as adding the numbers in two other cells or as complex as figuring the internal rate of return associated with the cash flow values found in a series of cell locations.

It is important to recognize that a cell containing a formula does not display the formula; instead, the cell displays a single number, which is the current computed value of the cell formula. Whenever any cell's value changes, every formula dependent on that cell is instantaneously revised and its new value displayed.

Text entries are typically used to label and describe the various components of the underlying numerical analysis and have a null computational value. Text is also used as descriptive data in lists.

Because every cell possesses identical capabilities, you can arrange the components of your analysis in whatever manner best meets your needs within this visually oriented matrix. This visual orientation, coupled with design flexibility, automatic recalculation, and an arsenal of layout, formatting, and analysis tools, has made the spreadsheet a powerful and widely used business analysis tool.

ILLUSTRATIONS OF WHAT SPREADSHEET ANALYSIS CAN DO

To illustrate the spreadsheet environment, consider its use in reporting and analyzing the profit/loss status of the hypothetical Ballwin plant, which is part of the XYZ Corporation. Figure 1.1 summarizes the plant's profit/loss statement for 1995. Notice how the two-dimensional worksheet matrix lends itself to the layout of Ballwin's profit/loss statement. Notice, too, how the labels clarify what the numbers represent. Column B contains the financial figures—revenue, expenses, and profit—for the first quarter of 1995, column C for the second quarter, and so on until you reach column F, which gives totals for the year.

Each row describes a different financial category. A title across the top of the table identifies the table as the profit/loss statement for the 1995 operations of the Ballwin plant. Figure 1.1 does not show how the values for Total Expense, Profits, and Year were obtained. They are the result of cell formulas. The total expense formula for the first quarter in cell B14 simply adds the values in cells B10, B11, and B12. The formula in cell D14 for profit/loss in the third quarter is the value associated with cell D7 less the value in cell D14.

These cell formulas have two interesting characteristics. First, if data errors are discovered, entry of correct values will result in instantaneous recalculation and display of the values of all formulas that have reference to the cells where the corrected values are located. The other implication is that if the XYZ Corporation standardizes profit/loss reporting for all its plants using the model in Figure 1.1, the formulas and almost all of the text have to be developed only once. A prebuilt application like this, which is meant to be used by many people, is called a *template*.

Worrying about rebuilding the Figure 1.1 model from scratch at each plant and for every year may seem ridiculous, but you must consider the size and nature of the reporting/analysis templates used in business. These templates involve hundreds of row categories and tens of columns. Financial experts spend many hours devising a template that best meets the needs of the firm and take great care to ensure the validity of its formulas. Employees spend many hours using the spreadsheet's extensive formatting and printing capabilities to achieve a desirable appearance. Frequently, the spreadsheet's protection features are

FIGURE 1.1 Ballwin Plant 1995 Profit & Loss Statement

	A	B	C	D	E	F	G
1				1995 Profit/Loss			
2				Statement			
3				Ballwin Plant			
4							
5							
6		Qtr 1	Qtr 2	Qtr 3	Qtr 4	YEAR	
7	REVENUE	25,578	28,072	28,053	22,275	103,978	
8							
9	EXPENSES						
10	Cost of Goods Sold	12,533	13,755	13,746	10,915	50,949	
11	Overhead	8,000	8,000	8,400	8,400	32,800	
12	Other	2,450	1,500	3,000	1,200	8,150	
13							
14	Total Expenses	22,983	23,255	25,146	20,515	91,899	
15							
16	PROFIT	2,595	4,817	2,907	1,760	12,079	
17							
18							
19							

Note: All figures in thousands of dollars

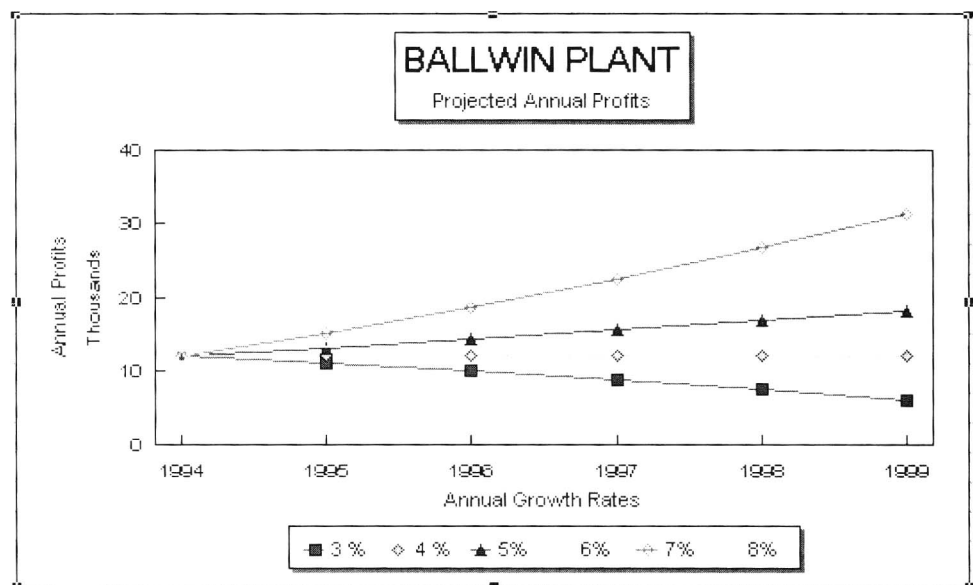
used to limit where data entries can be made. On large, complex templates, the spreadsheet's programming language turns the template into a menu/macro-driven application, which can be used by people with little or no knowledge of how to use a spreadsheet.

Many firms today use spreadsheets as a *consolidation* tool. Consider the XYZ Corporation. Within two weeks after the end of the fiscal year, each of XYZ's 30 plants telecommunicates its completed profit/loss templates to corporate headquarters. XYZ headquarters has a master template that automatically draws in the data of the plant templates and consolidates these data to form the corporation's profit/loss report.

Although the spreadsheet is frequently used in the reporting and consolidation of historical data, its real power resides in its ability to help you project and analyze data. For example, it is natural that XYZ Corporation would like to project profit/loss statements for each of its plants over the next five years and combine the plant projections into a consolidated one for the corporation. To make such projections, analysts could use the spreadsheet's ratio, charting, and regression analysis tools to identify trends and seasonality in each plant's historical sales and expense data. Once these trends and seasonal patterns are discovered, formulas can be developed that will project the plant's profit/loss statements for the next five years. The spreadsheet's charting capabilities show how profits are likely to evolve.

Figure 1.2 shows such a projection for the Ballwin plant under the anticipated annual sales growth rate of 4 percent and other estimates of what is most likely to happen. Since there is significant uncertainty about some of the assumptions driving these projections, spreadsheet "what-if" analysis can be employed. Figure 1.2 shows the results of a what-if analysis of profits based on different assumed annual rates of sales growth. In this case, annual profits will not continue to grow unless the sales growth rate exceeds 5 percent a year, an optimistic figure. This is a clear indication that something needs to be done. Possibly the firm needs to undertake a cost-containment/reduction program at the Ballwin plant. Maybe its products need to be redesigned to become more competitive in the

FIGURE 1.2 Ballwin Plant Projected Annual Profits



marketplace, or maybe the firm needs to use a different advertising/promotion strategy. XYZ can build worksheet models to test its options and perform what-if analyses to gain insight into how best to deal with the Ballwin situation.

While the worksheet, charting, and macro programming capabilities of spreadsheets have been mentioned, their database capabilities have not. The row and column orientation of the worksheet cells is ideally suited to the storage of related information about a set of items (e.g., attendance records of a firm's shop employees). Each row in this database can be related to a different employee. Each column may contain a specific type of information (e.g., name, department, supervisor, wage rate, days missed in each of the 12 months, Mondays missed, and so on). The spreadsheet program can sort employee records at computer speed and order them by department and within department by number of workdays absent. You can issue commands to prepare a list of the employees who were late on more than five Mondays last year. You can ask for a table of the per capita absences by department and by supervisor as shown in Figure 1.3.

LOTUS 1-2-3 FOR WINDOWS

1-2-3 for Windows, a microcomputer software package sold by Lotus Corporation, combines charting, database, programming, and other capabilities with its formidable spreadsheet capabilities. These features are presented with an easy-to-use *graphical user interface (GUI)*, shown in Figure 1.4, and numerous helps and shortcuts, such as SmartIcons, shortcut menus, and SmartMasters, which allow the beginning user to be productive very quickly.

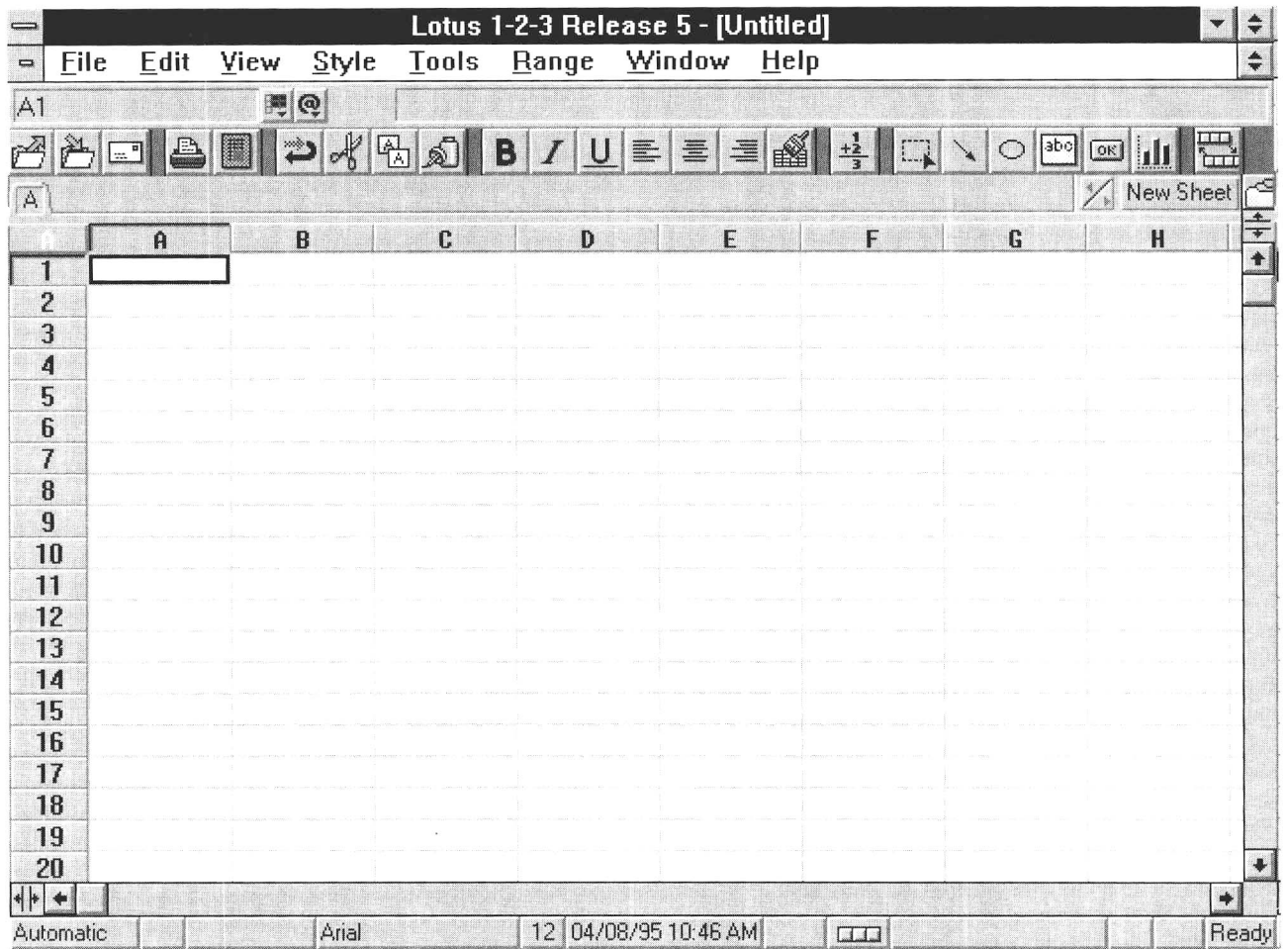
1-2-3's spreadsheet is built around a worksheet with 256 columns and 8,192 rows. Each of its more than two million cells can contain hundreds of characters of information. Assuming standard-size typed characters, the 1-2-3 worksheet is potentially equivalent to a piece of paper more than 100 feet long and 500 feet wide.

More than 200 special functions (mathematical, statistical, accounting, financial, and other areas) simplify writing cell formulas for complex analyses. Hundreds of special commands facilitate inserting and deleting rows and columns, changing column widths, altering the displays of descriptive labels and numbers, copying and moving cell contents, printing and saving your worksheet models, and so on.

FIGURE 1.3 Per Capita Absences by Department and Supervisor

Average Monthly Employee Absences				
Supervisor	Order Entry	Accounts Receivable	Accounts Payable	Payroll
J. Haskell	15			
B. Moody	3			
T. Kerchival	4			
J. Smith		4		
B. Jones		6		
E. Johansson			0	
S. Skidmore			3	
C. Eng				9
T. Gonzales				1

FIGURE 1.4 The 1-2-3 Graphical User Interface (GUI)



1-2-3 makes it easy to use worksheet information to create, view, and print professional-quality charts, including line, bar, pie, area, and XY charts, in both two and three dimensions. When changes made in the worksheet affect the information on which the chart is based, 1-2-3 automatically reflects these changes on the chart each time it is viewed or printed.

1-2-3's row and column format is ideal for storing and analyzing database information. While 1-2-3 is limited in the amount of database information it can handle at one time, it has a formidable arsenal of analytical tools for evaluating subsets of information downloaded into 1-2-3 from such dedicated database management programs as Approach[®], dBase III Plus[®], dBase IV[®], and Paradox[®]. These programs, however, lack 1-2-3's diversity of analysis tools.

1-2-3 contains a programming language that allows you to automate any sequence of manual 1-2-3 tasks. This language includes additional commands that permit 1-2-3 to be used as an environment for developing applications that can be used by people who have little knowledge of 1-2-3.