Database Management Using dBASE IV and SQL

Robert Grauer • Maryann Barber

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Robert Grauer

Maryann Barber

University of Miami

Mitchell McGRAW-HILL

New York St. Louis San Francisco Auckland Bogotá Caracas Hamburg
Lisbon London Madrid Mexico Milan Montreal New Delhi Paris
San Juan São Paulo Singapore Sydney Tokyo Toronto Watsonville

Mitchell **McGRAW-HILL**
Watsonville, CA 95076

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Commands and Functions in the Programmer's Notebook

?/??
???
*/NOTE
&
&&
@...CLEAR
@...FILL
@...SAY...GET
@...TO
ACTIVATE MENU
ACTIVATE POPUP
ACTIVATE SCREEN
ACTIVATE WINDOW
APPEND
APPEND FROM
ASSIST
AVERAGE
BAR()
BOF()
BROWSE
CALCULATE
CANCEL
CDOW()
CHR()
CLEAR
CLOSE
CMONTH()
COMPILE
CONFIG.DB
CONTINUE
COPY
COPY INDEXES
COUNT
CREATE
CREATE APPLICATION
CREATE LABEL
CREATE QUERY
CREATE REPORT
CREATE SCREEN
CREATE VIEW
CREATE VIEW FROM ENVIRONMENT
CTOD()
DATE()
DAY()
DEACTIVATE MENU
DEACTIVATE POPUP
DEACTIVATE WINDOW
DEBUG
DEFINE BAR
DEFINE MENU
DEFINE PAD
DEFINE POPUP
DEFINE WINDOW
DELETE
DELETE TAG
DELETED()
DIR
DISPLAY
DISPLAY HISTORY
DISPLAY MEMORY
DISPLAY STATUS
DISPLAY STRUCTURE
DO
DO CASE
DO WHILE
DTOC()
DTOS()
EDIT
EJECT
EOF()
FIND
FOUND()
GO
HELP
IF
IIF()
INDEX ON
INSERT
ISCOLOR()
JOIN
LABEL FORM
LEN()
LINENO()
LIST
LIST HISTORY
LIST MEMORY
LIST STATUS
LIST STRUCTURE
LOCATE
LOWER()
LTRIM()
MAX()
MIN()
MODIFY COMMAND
MODIFY LABEL
MODIFY QUERY
MODIFY REPORT
MODIFY SCREEN
MODIFY STRUCTURE
MODIFY VIEW
MONTH()
MOVE WINDOW
ON ERROR/ESCAPE/KEY
ON PAD
ON SELECTION PAD
ON SELECTION POPUP
PACK
PARAMETERS
PRINTSTATUS()
PRIVATE
PROCEDURE
PROMPT()
PUBLIC
QUIT
READ
RECALL
RECNO()
REINDEX
RELEASE
REPLACE
REPORT FORM
RESTORE
RESTORE WINDOW
RESUME
RETURN
RTRIM()
RUN
SAVE
SAVE WINDOW
SCAN
SEEK
SELECT
SET
SET ALTERNATE
SET AUTOSAVE
SET BELL
SET BORDER
SET CATALOG
SET CENTURY
SET CLOCK
SET COLOR
SET CONFIRM
SET CONSOLE
SET DATE
SET DEBUG
SET DEFAULT
SET DELETED
SET DELIMITERS
SET DEVELOPMENT
SET DEVICE
SET DISPLAY
SET ECHO
SET ESCAPE
SET EXACT
SET FIELDS
SET FILTER
SET FORMAT
SET FUNCTION
SET HEADING
SET HELP
SET HISTORY
SET INDEX
SET INTENSITY
SET MEMOWIDTH
SET NEAR
SET ORDER
SET PATH
SET PRINTER
SET PROCEDURE
SET RELATION
SET SAFETY
SET SCOREBOARD
SET SKIP
SET SPACE
SET SQL
SET STATUS
SET STEP
SET TALK
SET TRAP
SET TYPEAHEAD
SET UNIQUE
SET VIEW
SET WINDOW
SHOW MENU
SHOW POPUP
SKIP
SORT
SPACE()
STORE
STR()
SUBSTR()
SUM
SUSPEND
TIME()
TRANSFORM()
TRIM()
UPPER()
USE
VAL()
WAIT
YEAR()
ZAP

Preface to the Instructor

Database Management Using dBASE IV and SQL began as a revision of our existing text on data management. We had planned simply on a second edition but soon realized that the changes we had in mind would be too extensive. Hence the new title, and the new book—one written exclusively for dBASE IV, which includes material on relational databases as well as a detailed introduction to SQL.

Database Management Using dBASE IV and SQL teaches you how to program in dBASE IV, but it is much more than a book on dBASE IV programming. It is intended for a first course in data management, relational databases, and SQL; but is also the perfect text for course(s) in dBASE IV. Our book is suitable for the first-time user; it begins at the dot prompt and continues with the dBASE IV control center. It is also appropriate for the experienced dBASE user, as it contains detailed information on over 200 dBASE IV commands and functions, with supplementary chapters on structured programming and design.

Database Management Using dBASE IV and SQL is built on a unique combination of business case studies, Student Data Disk, hands-on exercises, and Programmer's Notebook. Equally important, this book has been written for the classroom; it contains many elements associated with good teaching and sound pedagogy. Every chapter begins with a statement of objectives and ends with a list of key words and concepts. It encourages hands-on participation and provides an abundance of exercises. Solutions to all of the exercises in the text are contained in the accompanying Instructor's Manual.

Distinguishing Features

- **Business Case Studies**—describe problems in database management with which students can readily identify. The case solutions present theoretical concepts of database design, as well as information about the dBASE IV commands needed in the eventual solution.
- **Student Data Disk**—contains dBASE IV implementations of the various case studies, saves the tedium of data entry, and enables the reader to explore dBASE IV in ways that otherwise would not be possible.
- **Hands-on Exercises**—require the reader's participation at the computer. The exercises encompass all major elements in dBASE IV, including commands from the dot prompt, selecting options from the control center, command level programming, and SQL.
- **Programmer's Notebook**—contains detailed information on over 200 commands and functions in dBASE IV. This valuable reference tool is designed for both the novice and the experienced dBASE IV user.
- **Structured Methodology**—Two chapters provide information on structured programming and design, pseudocode, hierarchy charts, and top-down implementation.
- **Student Edition of dBASE IV**—This version of the commercial program limits the number of records in a DBF file or SQL table to 120, changes the dot prompt to include (DEMO), but otherwise enables students to fully utilize dBASE IV.

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Instructor's Manual

Written by the authors, this comprehensive manual includes solutions to all exercises in the text. There is also a detailed lecture outline for each chapter, combined with teaching strategies and a series of "emergency lectures" in the form of pop quizzes.

Acknowledgments

The authors gratefully acknowledge the contribution of Erika Berg, sponsoring editor at Mitchell/McGraw Hill, without whom this book would not have been written. We are indebted to Greg Hubit, Betty Drury, and Jane Somers, who coordinated the production. We also thank our reviewers who, through their comments and constructive criticism, made this a far better book:

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Contents in Brief

PART I Introduction 1

CHAPTER 1 Introduction 3
CHAPTER 2 The Dot Prompt 25
CHAPTER 3 Indexing 47

PART II The Control Center 69

CHAPTER 4 The Report Generator 71
CHAPTER 5 Mail Merge and Label Forms 100
CHAPTER 6 Queries and Conditions 120
CHAPTER 7 The Screen Generator 146
CHAPTER 8 The Control Center 167

PART III Command-Level Programming 191

CHAPTER 9 Introduction to Programming 193
CHAPTER 10 Design and Implementation 225
CHAPTER 11 File Maintenance 245

PART IV Relational Databases 269

CHAPTER 12 Relational Databases 271
CHAPTER 13 Implementation in dBASE IV 288
CHAPTER 14 Introduction to SQL 310

The Programmer's Notebook PN-1

Index IN-1

Contents in Detail

Preface ix

PART I
Introduction 1

CHAPTER 1
Introduction 3

Overview 4
The Origins of dBASE 4
About DOS 5
- Subdirectories 5
- Commands for Subdirectories 6

Getting Started 9
The Student Version of dBASE IV 9
The Data Disk 9
Hands-on Exercise 1: Preliminaries 10
There's Always a Reason 12
Case Preview 13
Case Study: Soleil America, Inc. 13
Case Solution 14
Hands-on Exercise 2: The Soleil Employee System 16
Summary 22
Key Words and Concepts 22
True/False 23
Exercises 23

CHAPTER 2
The Dot Prompt 25

Overview 26
Vocabulary of Data Management 26
Elementary dBASE Commands 27
Hands-on Exercise 1: Elementary dBASE Commands 28
The Basics of dBASE 35
- The Record Pointer 36
- The dBASE Notation 36

More about the Basic Commands 38
Getting Help 39
- The **HELP** Command 39
- The Programmer's Notebook 40

A Look Ahead 41
Summary 42
Key Words and Concepts 42
True/False 43
Exercises 43

CHAPTER 3
Indexing 47

Overview 48
The Concept of Indexing 48
Implementation in dBASE IV 49
- Creating an Index 50
- The **SET ORDER** Command 50
- Updating Indexes 51

Hands-on Exercise 1: Indexing 52
Finer Points of Indexing 55
- The **INDEX ON** Command 56
- Indexing on a Concatenated Key 57
- Indexing in Descending Sequence 58
- Indexing on a Calculated Field 58

Hands-on Exercise 2: Finer Points of Indexing 59
Additional Commands 61
- **DISPLAY STATUS** Command 61
- **USE** with **ORDER** Command 61
- **DELETE TAG** Command 63

Error Messages 63
Summary 64
Key Words and Concepts 64
True/False 64
Exercises 65

PART II
The Control Center 69

CHAPTER 4
The Report Generator 71

Overview 72
Data versus Information 72

The dBASE Report Generator 72
The **REPORT FORM** Command 76
The Importance of the Record Pointer 76
Hands-on Exercise 1: The dBASE Report Generator 78
Use and Abuse of the Computer 80
Report Bands 81
Hands-on Exercise 2: Creating Report Forms 83
Obtaining Subtotals 88
Hands-on Exercise 3: Report Bands 88
Summary 94
Key Words and Concepts 95
True/False 95
Exercises 95

CHAPTER 5
Mail Merge and Label Forms 100

Overview 101
Case Preview 101
Case Study: The Dade County Metro Zoo 101
Case Solution 102
Designing the File Structure 102
The Mail-merge Operation 104
Mailing Labels 105
The **LABEL FORM** Command 106
The **TRIM** Function 106
Hands-on Exercise 1: Mailing Labels 107
Creating the Form Letters 110
Hands-on Exercise 2: Mail Merge 112
Summary 116
Key Words and Concepts 117
True/False 117
Exercises 117

CHAPTER 6
Queries and Conditions 120

Overview 121
A New Example 121
Conditions 122
Relational Operators 122
Logical Operators 123
Precedence of Operations 124
Identifying Individual Records 125
The **LOCATE** Command 125
The **FIND** Command 127
FIND versus **LOCATE** 127
FOR versus **WHILE** Condition 129
A Restricted View 130
The **SET FIELDS** Command 130
The **SET FILTER** Command 130
Hands-on Exercise 1: Finding (Locating) Individual Records 133
Query Files 134
Query by Example 135
The Calculated Fields Skeleton 137
Hands-on Exercise 2: Query by Example 137
Summary 142
Key Words and Concepts 142
True/False 143
Exercises 143

CHAPTER 7
The Screen Generator 146

Overview 147
Case Preview 147
Case Study: Michael Essman, Stock Broker 147
Case Solution 148
Data Entry 150
Data Validation 150
The **SET FORMAT** Command 152
Hands-on Exercise 1: Data Validation 153
The Screen Generator 155
Hands-on Exercise 2: The Screen Generator 158
Summary 164
Key Words and Concepts 164
True/False 164
Exercises 165

CHAPTER 8
The Control Center 167

Overview 168
The Control Center 168
The Navigation Line 170
Hands-on Exercise 1: Control Center 171
The Application Generator 178
Hands-on Exercise 2: Application Generator 180
dBASE IV File Types 185
Catalogs 186
Summary 187
Key Words and Concepts 187
True/False 188
Exercises 188

PART III
Command-Level Programming 191

CHAPTER 9
Introduction to Programming 193

Overview 194
A Menu-driven Program 194
Structured Programming 195
- Sufficiency of the Basic Structures 196
- Pseudocode 198

Developing the Menu-driven Program 199
Implementation in dBASE 201
- Statements for Structured Programming 203
- Input/Output Statements 204
- Memory Variables 204
- Statements Affecting the Record Pointer 204

The Completed Program 205
Implementation on the Computer 206
Hands-on Exercise 1: Menu-driven Programs 207
Errors in Execution 212
- The **DEBUG** Command 212

Hands-on Exercise 2: The Debugger 215
Coding Standards 217
Program Documentation 218
Summary 218
Key Words and Concepts 219
True/False 220
Exercises 220

CHAPTER 10
Design and Implementation 225

Overview 226
Case Study: Soleil America, Revisited 226
Structured Design 228
Creating the Hierarchy Chart 229
Evaluating the Hierarchy Chart 230
- Functionality 230
- Completeness 230
- Subordination 231

Structured Design versus Structured Programming 231
The **DISPLAY-MAIN-MENU** Program 233
Top-down Implementation 235
Hands-on Exercise 1: Top-down Testing/1 237
Additional Testing 237
Hands-on Exercise 2: Top-down Testing/2 239
Advantages of Top-down Implementation 241
Summary 242
Key Words and Concepts 242
True/False 243
Exercises 243

CHAPTER 11
File Maintenance 245

Overview 246
Limitations of the Dot Prompt 246
- Hands-on Exercise 1: Limitations of the Dot Prompt 247

The **ADDRECD** Program 250
- The Hierarchy Chart 250
- Pseudocode 251

The dBASE Listing 251
- **SET** Commands 252
- Procedures 255
- The **STORE** Command 257
- The **SEEK** Command 257

Additional Program Listings 257
- Public and Private Variables 257

File Maintenance 260
Hands-on Exercise 2: The File Maintenance Program 261
Summary 265
Key Words and Concepts 265
True/False 265
Exercises 266

PART IV
Relational Databases 269

CHAPTER 12
Relational Databases 271

Overview 272
Case Preview 272

Case Study: Fast Food Franchises 273
Case Solution 273
Single-file Solution 273
Multiple-file Solution 275
Queries to the Database 276
The Relational Model 277
Referential Integrity 278
Case Preview 278
Case Study: Student Transcripts 279
Case Solution 279
Case Preview 281
Case Study: Mail-order Systems 282
Case Solution 282
Summary 284
Key Words and Concepts 285
True/False 285
Exercises 285

CHAPTER 13
Implementation in dBASE 288

Overview 289
Case Preview 289
Case Study: The Coral Springs Soccer Association 289
Case Solution 290
Maintaining the Database 293
Hands-on Exercise 1: Generating Team Rosters 294
dBASE Commands and Concepts 299
The **SELECT** Command 299
The **SET RELATION TO** Command 299
The **DISPLAY STATUS** Command 300
Hands-on Exercise 2: The ***SELECT*** and **SET RELATION** Commands 302
The **ROSTER** Program 303
Summary 306
Key Words and Concepts 306
True/False 306
Exercises 307

CHAPTER 14
Introduction to SQL 310

Overview 311
Case Preview 311
Case Study: Class Scheduling 311
Case Solution 312
Overview of SQL 315
Implementation in dBASE IV 315
Hands-on Exercise 1: SQL and dBASE IV 316
The **SELECT** Command 321
LIKE Parameter 324
ORDER BY Clause 324
DISTINCT/ALL Parameter 324
COUNT Function 324
GROUP BY Clause 324
HAVING Clause 324
Multiple-table Queries 325
Views 326
The SQL Edit Window 326
Hands-on Exercise 2: The SQL **SELECT** Command 327
Maintaining the Database 329
Additional SQL Commands 329
Summary 331
Key Words and Concepts 332
True/False 332
Exercises 333

The Programmer's Notebook PN-1

An alphabetical listing of the major dBASE commands as covered in the text, with the material on each command divided into four sections: syntax, discussion, tips, and related topics. The Programmer's Notebook provides a convenient reference for particular programming questions, but is not intended as a replacement for the Ashton-Tate/Borland Technical Manuals. The table on the following page lists the commands covered in the Programmer's Notebook.

Index IN-1

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PART

Introduction

CHAPTER 1 **Introduction to dBASE IV**

CHAPTER 2 **The Dot Prompt**

CHAPTER 3 **Indexing**

CHAPTER

1

Introduction

OUTLINE

Objectives
Overview
The Origins of dBASE
About DOS
  Subdirectories
  Commands for Subdirectories
Getting Started
  The Student Version of dBASE IV
  The Data Disk
Hands-on Exercise 1: Preliminaries
There's Always a Reason
Case Preview
Case Study: Soleil America, Inc.
Case Solution
Hands-on Exercise 2: The Soleil Employee System
Summary
Key Words and Concepts
True/False
Exercises

OBJECTIVES

After reading this chapter you will be able to:

1. Discuss the importance of subdirectories in DOS; list the DOS commands associated with subdirectories and describe the purpose of each.
2. Differentiate between installation and loading; install and load the student version of dBASE IV.
3. Install the data disk that accompanies this text; describe the tree structure of the data disk and how to change from one directory to another.
4. Distinguish between the different versions of dBASE.
5. Load dBASE and arrive at the dot prompt; provide the dBASE command to change the default drive.
6. Differentiate between report generation and data entry; describe the primary data entry operations.
7. List several types of data validation that may be done during the course of data entry; describe the effects of entering improper data into a system.

Overview

This book is about data base management; in particular, it is about data base systems as they are developed in dBASE IV. Our overall objective is to acquaint you with the potential of these systems via a case study approach, and to enable you to design and implement these systems in dBASE. We follow a learn-by-doing approach that leads you through a series of ***hands-on exercises*** requiring your participation at the computer.

The hands-on exercises make extensive use of a ***data disk,*** which we provide with the text. The data disk contains over 200 files and is divided into ***subdirectories*** for more efficient storage organization. It is absolutely critical, therefore, that you understand the organization of the data disk, so we include a brief review of subdirectories and their associated DOS commands.

We also think it important that you appreciate what dBASE can ultimately do, so we present a fully functional system in conjunction with the data disk. The second half of the chapter describes a case study for the Soleil America Corporation, then follows with a hands-on exercise to demonstrate the completed system. We take you through the steps of ***adding, editing,*** and ***deleting*** records in existing files, then to the ***report generation*** process to present information based on the data you entered. We show you the importance of ***data validation*** and the utility of ***on-line help.*** Our emphasis at this time is on the nontechnical (or less technical) individual who knows what an information system is supposed to do, but who is not concerned with programming per se.

The Origins of dBASE

There never was a dBASE I, nor was there a person named Ashton. The product was originally called ***Vulcan*** (after the home planet of *Star Trek*'s Mr. Spock, a character known for his total recall). It was initially a commercial failure (no more than fifty copies were sold), and did not even recoup its advertising budget. At least one prominent company chose not to market the product, and its author, ***Wayne Ratliff,*** seriously considered selling all rights to the program for $3,000.

Today it is the flagship product of a $250 million company. The ***dBASE*** series has been translated into more than twenty languages, including French, German, Italian, Spanish, Portuguese, Danish, Dutch, Swedish, and Norwegian. The program is available in more than fifty countries on six continents, has sold in excess of three million copies, and continues to dominate the market.

George Tate and Hal Lashlee are the individuals most responsible for transforming Vulcan into dBASE II, and its successors, dBASE III, dBASE III Plus, and dBASE IV. In 1980 the two founded the Discount Software Group, which offered a toll-free number, low prices, prompt delivery, and after-sale support. Within a short time the fledgling company was selling $100,000 worth of software a month, a phenomenal sum at the time (IBM would not announce the PC for another year and a half). They soon acquired exclusive rights to Vulcan in return for a generous royalty.

A new company was formed to market the product, with the intention that Ratliff would continue to improve the program. The name was changed to dBASE II, a catchy name that implied an improvement over dBASE I, which, in fact, never existed. ***Ashton-Tate*** was chosen as the name of the new company because it had a better ring than either Tate & Lashlee or Lashlee & Tate.

dBASE III was announced in 1984, followed by dBASE III Plus in 1986, and dBASE IV in 1988. Unfortunately for Ashton-Tate, dBASE IV was replete with problems and was initially rejected by industry. It took the company nearly two years to release the widely anticipated upgrade, ***dBASE IV, Version 1.1,*** but this time they did it right. The new release is stable and reliable, and continues to gain increased acceptance. This text is written for dBASE IV (Version 1.1 or 1.5), but henceforth we will simply use dBASE for ease of discussion.

About DOS

Very little is assumed in the way of previous knowledge of ***DOS*** (the disk operating system), yet it is essential you understand subdirectories in order to effectively use the data disk that accompanies this text.We had thought about placing this material in an appendix, but found that it is more effective if it appears at the very beginning of the text. Accordingly, please read and/or review the following sections *before* proceeding to the hands-on exercises.

Subdirectories

Subdirectories divide a disk into separate areas, and thus provide a means for efficient file organization; thus, just as a book is divided into chapters, a disk is divided into subdirectories. You can, for example, establish one subdirectory for a word processing program (e.g., WordPerfect) and a different subdirectory to hold the documents it creates. You can even create different subdirectories for each type of document you use, such as one subdirectory for business letters, a different subdirectory for school assignments, and a still different subdirectory for personal correspondence.

You can establish other directories (***directory*** and ***subdirectory*** are used interchangeably) for other programs; e.g., one subdirectory for Lotus, and a different subdirectory for dBASE IV. And you can create still other subdirectories to hold the various spreadsheets and/or data management applications created through Lotus and dBASE, respectively.

Figure 1.1 depicts a series of subdirectories as they might appear on a *hypothetical* disk. The arrangement in the figure is described as a ***tree structure,*** because the various entries branch downward from the ***root directory*** at the top of the figure. The root directory in our example contains four subdirectories—**DBASEIV**, **WP**, **LOTUS**, and **DOS**—three of which have subdirectories that branch from them. The **DBASEIV** subdirectory contains two subdirectories of its own, **SOCCER** and **LOANS**. The **LOTUS** subdirectory also contains two subdirectories, and one of these, **SCHOOL**, contains yet additional subdirectories.

Multiple subdirectories can have the same name; for example, **SCHOOL** and **HOME** exist in two places in Figure 1.1. DOS does not get confused, however, because the ***path specification*** is unique for each directory; i.e., the first **SCHOOL** belongs to **WP**, which in turn belongs to the root directory, whereas the second **SCHOOL** belongs to **LOTUS**, which in turn belongs to the root.

Another way to view Figure 1.1 is to regard the root directory as the parent, and the **DBASEIV**, **WP**, **LOTUS**, and **DOS** subdirectories as its children. The **DBASEIV** directory in turn is viewed as the parent of the **SOCCER** and **LOANS** subdirectories. The family tree can go down as many generations as desired, with each directory containing a combination of files and/or other subdirectories.

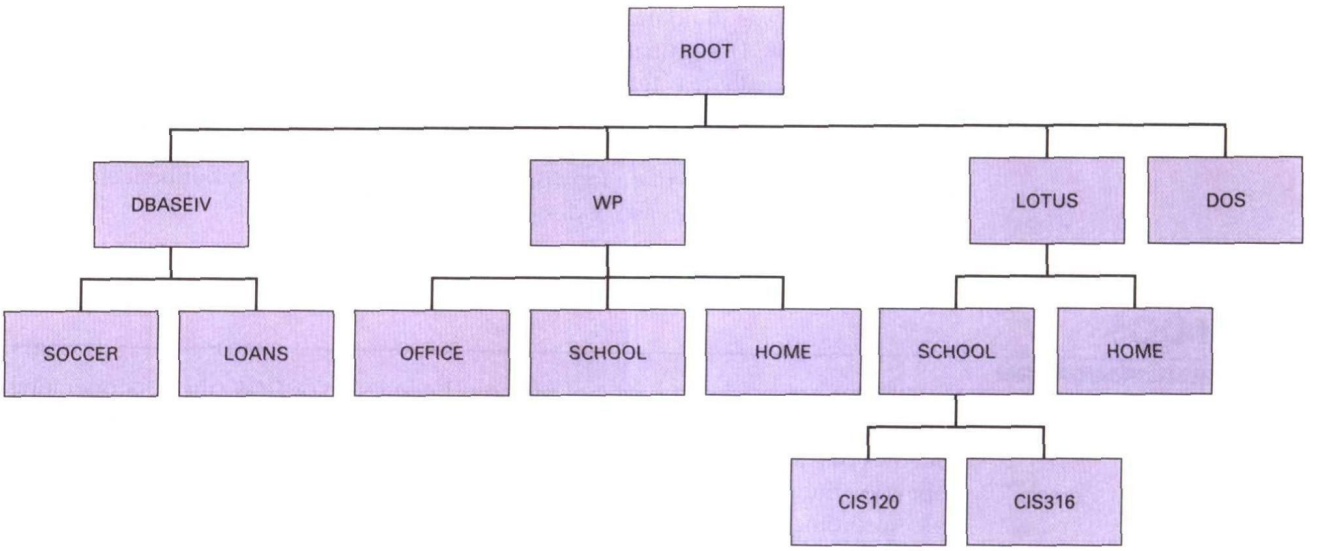

FIGURE 1.1
Tree Structure

At any given time you are logged into a specific (current) directory, which is treated *independently* of all other directories; i.e., any given command affects only (the files in) the current directory. In other words, **COPY *.*** or **ERASE *.*** pertain just to the files in the current directory, and not to all of the files on the disk. In similar fashion, execution of a **DIR** command displays only the names of the files and/or subdirectories in the current directory.

Figure 1.2a shows the output of a **DIR** command as it would appear when issued from the root directory of Figure 1.1. As you can see, the root directory contains three files and four subdirectories, and corresponds to the tree structure of Figure 1.1. Note, however, that the subdirectories **SOCCER**, **LOANS**, and so on, are not listed in the root directory, as these are children of other subdirectories.

Figure 1.2b shows the output of the **DIR** command as it would appear from the **DBASEIV** subdirectory. The **DBASEIV** directory contains seven program files as well as the names of two subdirectories (each one holding a different dBASE application). There are also two additional entries, a single and a double period, which appear in the directory listing of every subdirectory below the level of the root directory. The single period is a reference to the physical location of the subdirectory on the disk, while the double period is a reference to the physical location of its parent.

Finally, Figure 1.2c shows the output of the **DIR** command when issued from the **LOANS** subdirectory. This time there are five files but no subdirectories.

Commands for Subdirectories

DOS provides several commands that are used specifically with subdirectories. In particular, there are six such commands with which you should become familiar. These are:

MD to make (create) a subdirectory
CD to change to an existing subdirectory
RD to remove a subdirectory
TREE to display the tree structure of a disk
PATH to allow programs to be executed from other subdirectories
PROMPT to change the DOS prompt to include the current directory

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