

STRUCTURED MICROSOFT BASIC Essentials for Business

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**JAMES S. QUASNEY
JOHN MANIOTES**

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STRUCTURED MICROSOFT BASIC Essentials for Business

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PURDUE UNIVERSITY CALUMET



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Dedication

To our wives: ***Linda*** and ***Mary***

The Quasney tribe: ***Lisa, Jeff, Marci, Jodi, Amanda,*** and ***Nikole***

The Maniotes clan: ***Dionne, Sam,*** and ***Andrew***

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PREFACE



ABOUT THIS BOOK

Structured Microsoft BASIC: Essentials for Business is ideally suited for use in an introductory BASIC programming course that utilizes the IBM PC, or IBM PS/2, or compatible system. The text will also meet the needs of instructors teaching an Introductory Data Processing course in which BASIC is a component. *Structured Microsoft BASIC: Essentials for Business* is a perfect complement to the many fine Introductory Computer Information Systems texts on the market today.

OBJECTIVES OF THIS BOOK

The objectives of this book are as follows:

- To acquaint the reader with the correct way to design and write high-quality programs.
- To teach the fundamentals of Microsoft BASIC.
- To teach good problem-solving techniques that can be used in advanced computing and information-processing courses.
- To encourage independent study and help those who are working alone on their own personal computer systems.

LEVEL OF INSTRUCTION

No previous experience with a computer is assumed, and no mathematics beyond the high school freshman level is required. The book is written specifically for the student with average ability, for whom continuity, simplicity, and practicality are characteristics we consider essential. Numerous insights, based on the authors' fifty cumulative years of experience in teaching and consulting in the field of data processing, are implicit throughout the book. For the past fifteen years, we have both taught introductory programming courses using BASIC.

FUNDAMENTAL TOPICS ARE PRESENTED IN DETAIL

Besides introducing students to the correct way to design and write programs by means of structured and top-down techniques, the book presents fundamental topics concerning computers and programming which should be covered in any introductory programming class. These include the stored program concept; getting acquainted with the PC; editing programs; input/output operations; variables and constants; simple and complex computations; the use of functions and subroutines; decision making; the use of counters and running totals; looping and end-of-file tests; counter-controlled loops; the use of logical operators; string manipulation; and graphics. Other essential topics include data validation; table processing; selection; searching; matching; sorting; file processing; and the differences between batch and interactive applications. Every one of these topics is covered in detail in this book.

DISTINGUISHING FEATURES

The distinguishing features of this book include the following:

A Proven Book

This book has evolved over the past decade and is based on the authors' five prior books on BASIC programming. Many instructors who have used our books have shared with us their comments and suggestions for improvement as new programming techniques have been developed. They have done much to shape the contents of this book, which reflects modern programming practices.

Early Presentation of the Structured Programming Approach

Particular attention is given to designing proper programs by means of the three logic structures of structured programming: Sequence, Selection (If-Then-Else and Case), and Repetition (Do-While and Do-Until). A disciplined method for implementing the structured design is adhered to throughout the book.

BASIC Programming Problems with Sample Input and Output

Over 30 challenging field-tested BASIC Programming Problems are included at the end of the chapters. Each of the problems include a statement of purpose, a problem statement, sample input data, and the corresponding output results. Hardcopy and softcopy (Instructor Diskette) solutions to these problems are given in the *Instructor's Manual and Answer Book*.

Student Diskette

The Student Diskette that accompanies this book contains all of the executable programs and data files presented in the text. Students can use this valuable learning aid for the following:

- to select a program that is similar to their solution to a programming assignment (this will save keying time);
- to experiment on their own with developing alternative solutions to the Programming Case Studies presented in the text;
- to access the data files required in the programming assignments; and,
- to store their solutions to programming assignments.

Program names on the Student Diskette are in the form of PRGc-n, where c represents the chapter number and n represents the program number. For example, PRG2-8 refers to the eighth program presented in Chapter 2. Data file names correspond to the names used in the text.

GOTOless Textbook

The GOTO is discussed briefly. All looping is implemented by means of either the WHILE and WEND statements or the FOR and NEXT statements. The GOTO statement is used only to branch forward to a structure terminator when IF statements require more than three physical lines.

Interactive Applications (Menu-Driven Programs)

Although examples of batch processing are presented, the primary emphasis is on interactive processing. The reader is introduced to the INPUT, PRINT, and CLS (Clear Screen) statements early in Chapter 2. The LOCATE statement is presented in Chapter 4 and thereafter is used to build screens. Menu-driven programs are illustrated to familiarize the reader with the type of programming that is proliferating today.

Emphasis on the Program Development Cycle

The program development cycle is presented early in Chapter 1 and is used throughout the book. Good design habits are reinforced, and special attention is given to testing the design before attempting to implement the logic in a program.

Emphasis on Fundamentals and Style

Emphasis is placed on the fundamentals of producing well-written and readable programs. A disciplined style is consistently used in all program examples. Thorough documentation and indentation standards illuminate the implementation of the Selection and Repetition logic structures.

Summary of the Microsoft BASIC Language on a Reference Card

A summary of the statements, commands, functions, special variables, special keys, operators, and reserved words can be found on a reference card at the back of the book. This summary is invaluable to the beginning student as a quick reference piece.

Presentation of Programming Case Studies

This book contains 15 completely solved and annotated case studies, illuminating the use of Microsoft BASIC and computer programming in the real world. Emphasis is placed on problem analysis, program design, and an in-depth discussion of the program solution. The program solutions to these Programming Case Studies, as well as all other programs found throughout the book, are available on the Student Diskette in the back of this book.

Program Design Aids

The authors recognize top-down charts and flowcharting as excellent pedagogical aids and as the tools of an analyst or programmer. Hence, many of the Programming Case Studies include top-down charts and program flowcharts to demonstrate programming style, design, and documentation. For the reader's convenience, line numbers have been placed at the top-left corner of the symbols to better illustrate the relationship between the logic diagrams and the program.

Test Your BASIC Skills

A set of short-answer exercises identified as Test Your BASIC Skills appears at the end of each chapter. Over 100 problems, many of which are complete programs, are included for practice. Through the use of these exercises, the reader can master the concepts presented and instructors are afforded a valuable diagnostic tool. Answers for the Test Your BASIC Skills exercises (even-numbered) are included at the end of the book in Appendix B. Answers to the odd-numbered exercises can be found in the *Instructor's Manual and Answer Book*.

Graphics and Sound

Chapter 9 covers the graphics statements and functions in Microsoft BASIC that are central to understanding what can be done with graphics on the PC. Furthermore, the necessary sound and music statements are discussed and are applied to various applications.

ANCILLARY MATERIALS

A comprehensive instructor's support package accompanies *Structured Microsoft BASIC: Essentials for Business*. These ancillaries are available upon request from the publisher.

Instructor's Manual and Answer Book

The *Instructor's Manual and Answer Book* includes the following:

- Lecture outlines for each chapter
- Transparency masters from each chapter of the text
- Chapter-by-chapter objectives and vocabulary lists
- Answers to the odd-numbered Test Your BASIC Skills exercises
- Program solutions to the programming assignments in the book
- Test bank, including true/false, short-answer, fill-in, and multiple-choice questions for quizzes and tests

ProTest: An Easy-to-Use Computerized Test-Generating Package

Boyd & Fraser's state-of-the-art test-generating package, ProTest, has been designed specifically for this book. ProTest is an easy-to-use menu-driven package that is supplied on an IBM PC-compatible diskette. ProTest allows an instructor to create a customized test on the PC in a matter of minutes. The large test bank that accompanies ProTest includes field-tested true/false, multiple-choice, and fill-in questions. A user may also enter his or her own questions into the test bank.

ProTest will run on any IBM PC, IBM PS/2, or compatible system with two floppy-diskette drives or a hard disk.

Instructor Diskette

The Instructor Diskette that accompanies the *Instructor's Manual and Answer Book* includes the solutions to the programming assignments found at the end of Chapters 2 through 9.

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We would like to thank and express our appreciation to the many fine and talented individuals who have contributed to the success of this book. We were fortunate to have a group of reviewers whose critical evaluations of our first five BASIC books, *Standard BASIC Programming*; *BASIC Fundamentals and Style*; *Complete BASIC for the Short Course*; *Applesoft BASIC Fundamentals and Style*; and *Structured BASIC Fundamentals and Style for the IBM PC and Compatibles*, were of great value during the preparation of these books. Special thanks again go to Professor James N. Haag, University of San Francisco; Professor R. Waldo Roth, Taylor University; Professor David Bradbard, Auburn University; Professor Donald L. Muench, St. John Fisher College; Professor Jerry Lameiro, Colorado State University; Professors John T. Gorgone and I. Englander of Bentley College; Professor Chester Bogosta, Saint Leo College; Professor John J. Couture, San Diego City College; Professor Syed Shahabuddin, Central Michigan University; Sumit Sircar, University of Texas at

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Hammond, Indiana
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James S. Quasney
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CONTENTS

PREFACE	xi
LIST OF PROGRAMMING CASE STUDIES	xvii
■ 1 COMPUTERS AND PROBLEM SOLVING: AN INTRODUCTION	1
1.1 What Is a Computer?	1
1.2 Computer Hardware	2
1.3 The PC and PS/2 Family	4
1.4 The Stored Program Concept	8
1.5 Computer Software	8
1.6 Problem Solving and Program Development	10
1.7 Test Your BASIC Skills	14
1.8 PC Hands-on Exercises	16
■ 2 MICROSOFT BASIC: AN INTRODUCTION	19
2.1 Creating a Microsoft BASIC Program	19
2.2 The INPUT Statement	23
2.3 The PRINT and CLS Statements	26
2.4 Documenting a Program — The REM Statement	28
2.5 Getting Acquainted with the PC	30
2.6 Editing Microsoft BASIC Programs	32
2.7 System Commands and Hard-Copy Output	33
2.8 Special Keys	37
2.9 Programming Tips	37
2.10 Test Your BASIC Skills	41
2.11 BASIC Programming Problems	42

■ 3	PROGRAMS WITH CALCULATIONS AND STRINGS	45
3.1	Introduction	45
3.2	Constants	46
3.3	Variables	49
3.4	The LET Statement	54
3.5	Expressions	57
3.6	Test Your BASIC Skills	62
3.7	BASIC Programming Problems	63
■ 4	LOOPING AND INPUT/OUTPUT PROCESSING	67
4.1	Introduction	67
4.2	The WHILE and WEND Statements	70
4.3	The READ, DATA, and RESTORE Statements	72
4.4	The PRINT Statement	78
4.5	The PRINT USING Statement for Formatted Output	83
4.6	The LOCATE Statement	93
4.7	Test Your BASIC Skills	95
4.8	BASIC Programming Problems	97
■ 5	STRUCTURED PROGRAMMING AND DECISION MAKING	101
5.1	Structured Programming	101
5.2	The IF Statement	104
5.3	Accumulators	106
5.4	Implementing the Do-While and Do-Until Logic Structures	112
5.5	Implementing the If-Then-Else Structure	114
5.6	Pairing of Nested IF Statements	119
5.7	Logical Operators	120
5.8	Test Your BASIC Skills	126
5.9	BASIC Programming Problems	129

■ 6 SEQUENTIAL FILE PROCESSING AND THE TOP-DOWN APPROACH 133

6.1	Introduction	133
6.2	Data Files	133
6.3	Sequential File Processing	134
6.4	The Top-Down (Modular) Approach and the GOSUB and RETURN Statements	150
6.5	The ON-GOSUB Statement and Menu-Driven Programs	155
6.6	Control-Break Processing	164
6.7	Test Your BASIC Skills	171
6.8	BASIC Programming Problems	173

■ 7 FOR LOOPS, ARRAYS, SORTING, AND TABLE PROCESSING 177

7.1	Introduction	177
7.2	The FOR and NEXT Statements	177
7.3	Arrays Versus Simple Variables	183
7.4	Declaring Arrays	184
7.5	Manipulating Arrays	186
7.6	Multi-Dimensional Arrays	187
7.7	Sorting	189
7.8	Searching Tables	193
7.9	Test Your BASIC Skills	200
7.10	BASIC Programming Problems	202

■ 8 MORE ON STRINGS AND FUNCTIONS 205

8.1	Introduction	205
8.2	String Functions, String Statements, and Special Variables	205
8.3	Numeric Functions	216
8.4	User-Defined Functions	227
8.5	Test Your BASIC Skills	229
8.6	BASIC Programming Problems	231

■ 9 COMPUTER GRAPHICS AND SOUND	235
9.1 Introduction	235
9.2 Text-Mode Graphics	237
9.3 Medium-Resolution and High-Resolution Graphics	244
9.4 Sound and Music	256
9.5 Test Your BASIC Skills	259
9.6 BASIC Programming Problems	260
 APPENDIX A DEBUGGING TECHNIQUES AND THE ASCII CHARACTER CODES	 263
A.1 Debugging Techniques	263
A.2 ASCII Character Codes	266
 APPENDIX B ANSWERS TO THE TEST YOUR BASIC SKILLS EXERCISES (EVEN-NUMBERED)	 269
 INDEX	 277
 MICROSOFT BASIC REFERENCE CARD	 R.1
 RESERVED WORDS	 R.5
 STUDENT DISKETTE	 R.5

LIST OF PROGRAMMING CASE STUDIES

No.	Case Study	Page
1	Computing an Average	10
2	Determining a Salesperson's Commission	20
3	Tailor's Calculations	45
4A	Finding the Single Discount Rate	55
4B	Finding the Single Discount Rate Using the Top-Down Approach	152
5	Determining the Sale Price	67
6	Determining the Accounts Receivable Balance	90
7A	Weekly Payroll and Summary Report	108
7B	Writing the Weekly Payroll and Summary Report to Auxiliary Storage	139
8	Creating a Sequential File	142
9	Processing a Sequential File	147
10	A Menu-Driven Program	156
11	Sales Analysis Report — Single-Level Control Break	166
12	Deciphering a Coded Message	211
13	Determining the Time It Takes to Double an Investment	218
14	Computer Simulation	225
15	Logo for the Bow-Wow Dog Food Company	238