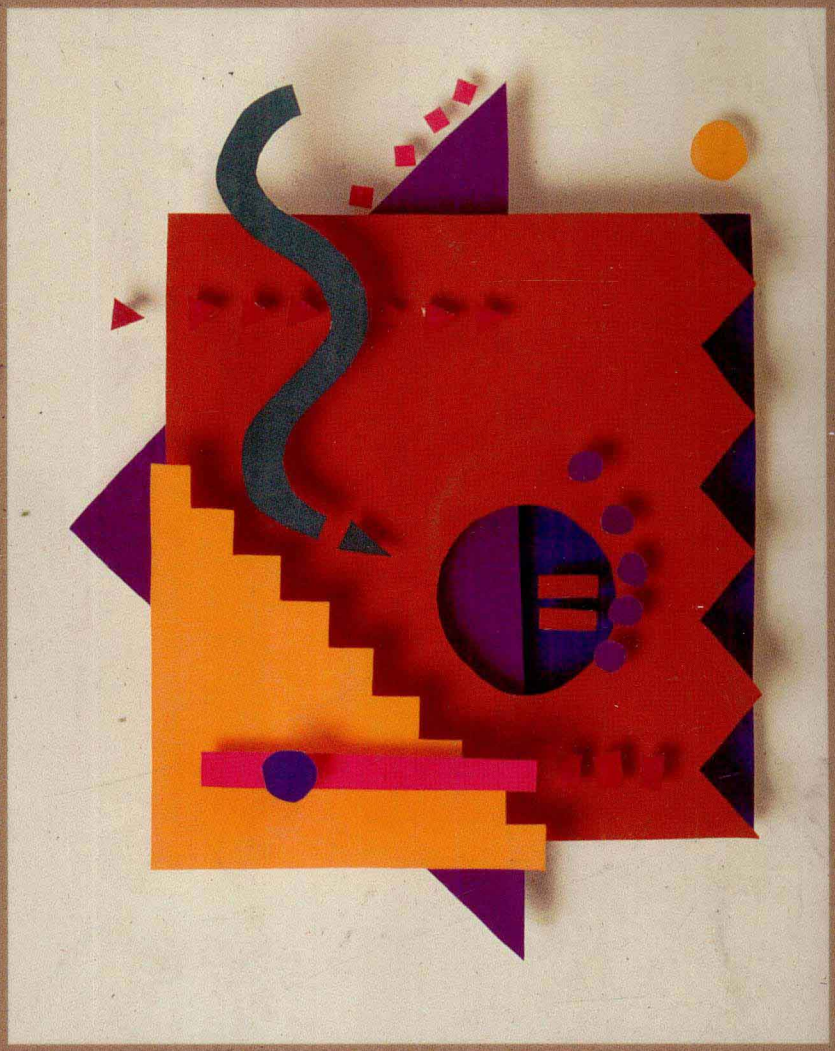
# ESSENTIALS OF
# INFORMATION PROCESSING

THIRD EDITION



NANCY A. FLOYD

# ESSENTIALS OF
# INFORMATION PROCESSING

THIRD EDITION

NANCY A. FLOYD

IRWIN

Homewood, IL 60430
Boston, MA 02116

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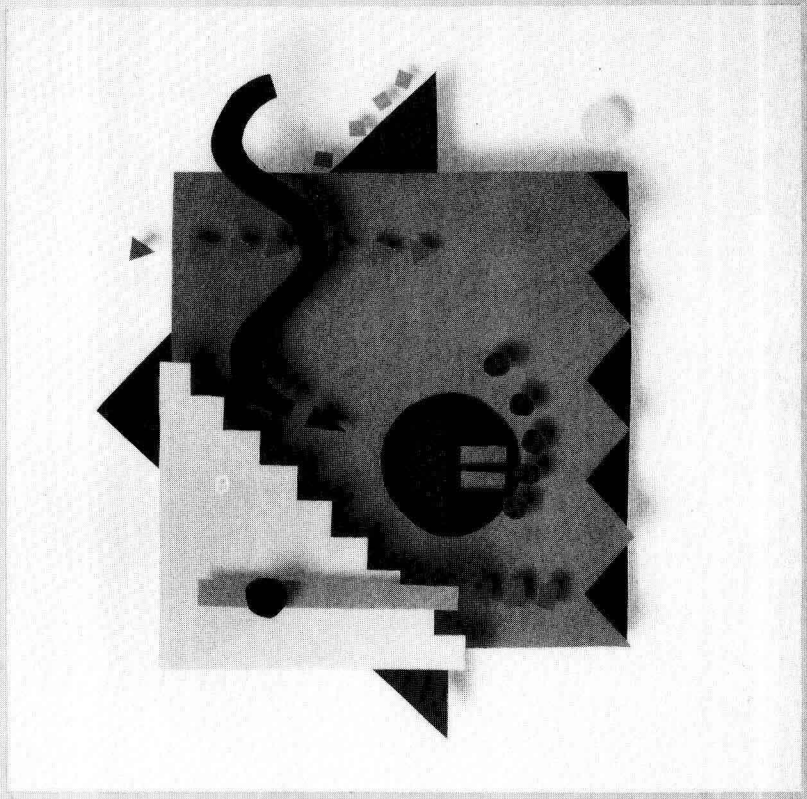
E S S E N T I A L S O F

# INFORMATION PROCESSING



## APPLICATIONS

1. Convert the following binary numbers to decimal.
   a. 10110.
   b. 1000001.
2. Convert the following octal numbers to decimal.
   a. 713.
   a. 6571.
3. Convert the following hexadecimal numbers to decimal.
   a. ACOD.
   b. 1C7B.
4. Convert the following decimal numbers to binary, octal, and then hexadecimal.
   a. 12,345.
   b. 1,007.
5. Convert the following octal numbers to binary. Check by converting both the original octal number and the converted binary number to decimal.
   a. 643.
   b. 71.
6. Convert the following hexadecimal numbers to binary.
   a. 2CF.
   b. B1C.
7. Convert the following binary numbers to hexadecimal.
   a. 10111.
   b. 111011.
8. Translate into English the following quotation displayed in the EBCDIC code:
   C8 C5 D3 D7
9. Translate into English the following quotation displayed in ASCII code:
   100 1101 100 0101 101 0100 100 1111 100 1111

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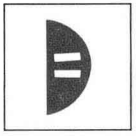

# Preface

## The Intended Audience for This Book

The growth and development of computers has affected almost every aspect of our lives. Consequently, the student taking an introductory information processing course today may be majoring in computer studies, may be in a related field such as business, or may use computers only in support of his or her area of expertise. This diverse group of students—enrolled in two- or four-year colleges, computer information systems (CIS) majors or nonmajors—has one important, unifying goal: the need to learn both how to use a computer and the fundamental computer concepts. By providing in-depth coverage of essential concepts, *Essentials of Information Processing* is intended to support a practical first course in computer information processing for nonmajors, as well as for majors who are enrolled in an introductory course combining the teaching of factual information about computers with the opportunity for hands-on computer use. This would include introductory information processing courses alone, with a programming language such as BASIC, or with microcomputer applications: word processing, spreadsheets, and/or database.

## Why This Book Was Written

Students today are interested in gaining the practical information they need to deal with computers in the workplace. They need to learn key concepts and important terminologies without being burdened with unnecessary detail. They need to learn to *use* computers but they also need to learn *about* computers. This book was written because the available textbooks did not satisfy students' needs. Specifically:

1. The big, four-color introductory texts are too big for many courses. They contain too much material to cover in the time available. Because of this,

many professors must attempt to make the big books "fit" their courses by eliminating chapters, thereby also eliminating coverage of valuable concepts. Other professors attempt to solve this problem by assigning selected readings from within each chapter, thereby creating gaps that can cause problems in student comprehension.

2. Even more elaborate "surgery" is necessary if the professor wants to include coverage of a computer language such as BASIC or of microcomputer applications.

3. Material may be deleted but the price remains the same. Professors pay a price in time spent tailoring the text to meet their course requirements; students pay the price of an expensive four-color book of which they use only a portion.

4. The smaller introductory information processing books also may miss the mark in satisfying course needs. Some texts have shallow coverage of too few concepts. These texts, in attempting to be shorter, end up with a coverage that lacks depth and fails to include important topics.

5. Many texts do not have a practical orientation. Some texts contain material that is too technical for nonmajors—for example, focusing primarily on programming. Others focus on the societal implications of the computer without covering enough technical material. Still other texts look only at microcomputers. For many reasons, these texts fail to address what the average person needs to know about dealing with computers in his or her career and family activities.

## Why You Should Consider This Book

I really believe *Essentials of Information Processing* will better suit your course needs than any other book because:

1. This book is designed so that all the material can be covered in one term, with or without a lab. This permits maximum flexibility for those professors who want to cover BASIC programming or microcomputer applications as well as essential information processing concepts. The decision to include topics was based on whether that information was essential to both majors and nonmajors.

2. This book is responsive to trends in the way information processing is being taught today. For example, more courses are including segments on microcomputer applications. The professor using this book is given the flexibility to accompany the text with any software of his or her choice rather than building specific software into the text. In response to requests, this third edition has rearranged the sequence of topics to that preferred by a majority of users. Additional material on cache memory, OS/2 and Macintosh OS, CD-ROM, CAD/CAM, desktop publishing, graphics, and computer viruses is included. In addition, since many of the test bank questions appeared with both the first and second edition, the entire text bank has been rewritten.

3. This book offers a practical, microcomputer-oriented approach to information processing concepts. Content is presented so that students can identify with it and immediately use it in their own lives. Students are taught what they need to know to interact with computers and the persons who program those computers. Also, this book covers practical information about the type of computer that students are most likely to encounter—the microcomputer. This microcomputer orientation throughout the text is bolstered by two chapters that are microcomputer specific. Chapter 6, "Microcomputer Applications," is now illustrated using Microsoft® Works rather than Symphony®. In addition, other chapters contain sections on how to store and handle diskettes, how to select and purchase software, how to read computer advertisements, and a checklist for purchasing hardware.

4. This book is up to date. Topics include robotics, decision support systems, fifth-generation computers, expert systems, and artificial intelligence.

5. This book was written for students. It presents essential concepts in a concise, clear, easy-to-understand manner so that students will be interested and encouraged rather than intimidated. Discussions are not overly technical. Concepts are explained through the use of objects and events with which students can relate. For example, in the explanation of how matrix construction creates letters, the matrix pins of a printer are compared to the individual bulbs that light up to show the score on a basketball scoreboard (Chapter 3). The functional use of a second color also enhances student interest. Carefully developed in-text learning aids ensure student comprehension. These include:

**Chapter Objectives.** After studying the chapter, students can use the list of objectives to test their understanding of the chapter contents.

**Overview.** Following the Chapter Objectives is a brief introduction that previews chapter content.

**On-the-Job boxes.** Each chapter contains this feature, which highlights how computers are used in the business world and reinforces chapter concepts.

**Summary.** All chapters end with a brief section summarizing the topics covered. Students can use this feature for review and study purposes.

**Definitions.** Terms are boldfaced and defined on first mention within chapters. All boldfaced terms appear in the end-of-text glossary.

**Exercises.** Each chapter ends with discussion questions that test student comprehension of chapter contents.

**Projects.** Following the Exercises are Projects to expand students' learning experience beyond the text.

6. The Study Guide is now included at the rear of the text. Pages are perforated so that professors wishing to see assignments may have them removed from the text. In addition, the Study Guide contains case studies for all chapters except the first.

## How to Use This Book

*Essentials of Information Processing,* third edition, is designed so that all material may be completed in one term. Specific suggestions on how to use the book in the various course configurations can be found in the Instructor's Manual. The conciseness of the text offers the professor the flexibility to decide to:

### *Use the Text by Itself*

This book is self-contained; it covers all essential computer concepts. For the class taught without a lab, the Projects at the end of each chapter offer students some exposure to computer use. If there is a programming lab, and a brief introduction to BASIC is desired, the BASIC appendix can be used. If the section is made up of majors who need to understand data representation, Appendix B, which covers binary, octal, and hexadecimal numbering systems as well as EBCDIC and ASCII, may be added. The Study Guide is available to all students; they don't need to purchase a separate text.

### *Use This Text with a Language Supplement*

Irwin's Cohen, Alger, and Boyd, *Business BASIC for the IBM PC with Cases,* might be suitable for a machine-specific business approach. Other language supplements may also be used.

### *Use This Book with a Microcomputer Supplement*

This text may be used with several of Irwin's texts. Dravillas, Stilwell, and Williams, *Power Pack for the IBM PC,* offers generic explanation of packages and comes with software. Spence and Windsor, *Using Microcomputers: Applications for Business,* offers generic concepts and hands-on coverage of 15 popular business packages and hands-on software. Spence and Windsor, *Microcomputers in Business: WordStar, dBase II and III, and Lotus 1-2-3,* or Chao C. Chien, *Introduction to the Microcomputer and Its Applications: PC–DOS, WordStar, Lotus 1-2-3, and dBase,* would also be appropriate choices.

## Supplements

Because of the large number of adjunct faculty, part-time faculty, and teaching assistants who often teach an introductory course, a solid package of instructional supplements has been created. These include:

1. Instructor's Manual. This supplement, written by Nancy A. Floyd, contains:

   Answers to all exercises in the book.
   Chapter outlines to use as lecture guides.
   Transparency masters of key figures in the text, modifications of text figures, and totally new illustrations.

2. Additional lab exercises and lecture material to supplement the text.

3. Accompaniment notes that address how to use this book (1) with a BASIC text, (2) with a microcomputer text, and (3) with both a BASIC and a microcomputer text.
4. Teaching tips for the instructor.
5. Annotated journal references.
6. Topics for discussion relevant to chapter contents.
7. Test bank questions. The printed version of the test items includes approximately 1,300 items using the following formats:

   Multiple choice.
   Fill-in-the-blank.
   Matching.
   Short answer.
   True/false.

8. A computerized testing package is available from the publisher to all adopters.

## ACKNOWLEDGMENTS

I am indebted to the many people who contributed to the development of the third edition of this book: to my husband and family who supported my decision to write it and to the following reviewers whose feedback and suggestions were invaluable.

### Reviewers

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Special thanks are due the staff of Richard D. Irwin: Sponsoring Editor Larry Alexander, and Editorial Coordinator Lena Buonanno. Their guidance and support made it all possible.

I assume full responsibility for any errors or inaccuracies. Any comments, criticisms, suggestions, or improvements are welcome. Write to me in care of Richard D. Irwin, Inc., 1818 Ridge Road, Homewood, Illinois 60430.

**Nancy A. Floyd**

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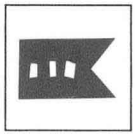

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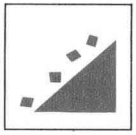

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