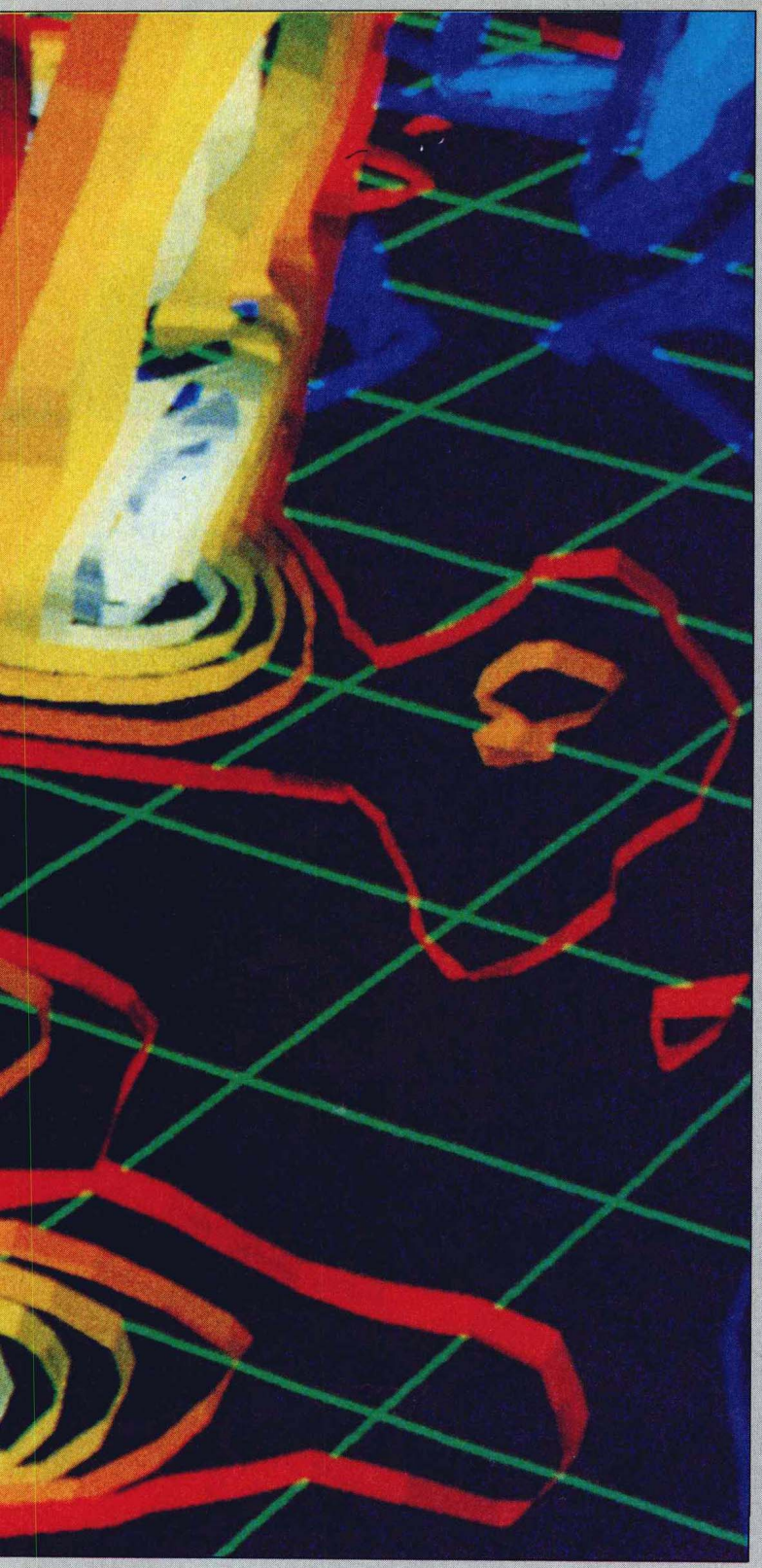
INTRODUCTION TO COMPUTERS AND INFORMATION SYSTEMS

Second Edition

ROBERT A. SZYMANSKI DONALD P. SZYMANSKI
NORMA A. MORRIS DONNA M. PULSCHEN



SECOND EDITION

Introduction to Computers and Information Systems

ROBERT A. SZYMANSKI
DONALD P. SZYMANSKI
NORMA A. MORRIS
DONNA M. PULSCHEN

Macmillan Publishing Company
New York

Collier Macmillan Canada, Inc.
Toronto

Maxwell Macmillan International Publishing Group
New York Oxford Singapore Sydney

Cover art copyright 1989 J. P. Thirion—LIENS/CNRS (Paris)

Executive Editor: Vernon R. Anthony
Developmental Editor: Peggy H. Jacobs
Production Editor: Sharon Rudd
Art Coordinator: Lorraine Woost
Photo Editor: Gail Meese
Text Designer: Cynthia Brunk
Cover Designer: Brian Deep
Production Buyer: Pamela D. Bennett

This book was set in Meridien and Univers.

Copyright © 1991 by Macmillan Publishing Company, a division of Macmillan, Inc.

Previous edition(s) copyrighted 1988 by Merrill Publishing Company.

Printed in the United States of America

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the Publisher.

Macmillan Publishing Company
866 Third Avenue, New York,New York 10022

Collier Macmillan Canada, Inc.

Library of Congress Catalog Card Number: 90–53389
International Standard Book Number:
0–675–21272–3
Printing: 1 2 3 4 5 6 7 8 9 Year: 1 2 3 4

Photographs without specific credits following their captions are by Macmillan Publishing/Cobalt Productions.

Part opening quotations: Part One (p. 1), Asimov, Isaac. "Asimov Ponders PCs." *PC World.* (September 1985): 190. Part Two (p. 161), Diebold, John. "Rethinking Automation." *Computerworld.* (3 November 1986): 124. Part Three (p. 289), Ritchie, David. *The Binary Brain: Artificial Intelligence in the Age of Electronics.* (Boston: Little, Brown, & Co., 1984): 196. Part Four (p. 399), Case, John. *Digital Future: The Personal Computer Explosion—Why It's Happening and What It Means.* (New York: William Morrow & Co.,1985): 177. Part Five (p. 603), Kurzweil, Raymond. "The Second Industrial Revolution." *Computerworld.* (3 November 1986): 58.

All screen representations of software are used with permission of their respective copyright owners: Multimate®, MultiMate Advantage™, and MultiMate Advantage II are copyright © Ashton-Tate Corporation, 1987. MultiMate Advantage and MultiMate Advantage II are trademarks, and MultiMate is a registered trademark of Ashton-Tate Corporation, Torrance, California; SideKick by Borland International, Inc., Scotts Valley, California; PC-TALK III by The Headlands Press, Tiburon, California; The Twin Spreadsheet by Mosaic Software, Inc., Cambridge, Massachusetts; Open Access II by Software Products International, Inc., San Diego, California; PFS:First Choice by Software Publishers Corporation, Mt. View, California; WordPerfect by WordPerfect Corporation, Orem, Utah; Commodore Educational by Commodore Computer Systems Division, West Chester, Pennsylvania; MultiPlan by Microsoft Corporation, Redmond, Washington; and Apple Desktop Publishing by Apple Computer, Inc., Coopertino, California. Apple, Macintosh, and LaserWriter are trademarks of Apple Computer, Inc.

Part opening artwork courtesy of: David E. Breen, Rensselaer Polytechnic Institute, p. 1; Lasergraphics, Inc., pp. 161, 399; Marsha McDevitt, Advanced Computing Center for the Arts and Design, The Ohio State University, p. 603; and John Stamos, p. 289.

Chapter opening artwork courtesy of: Alias Research Corporation, pp. 125 (top), 322, 365 (top), 583 (bottom), 637 (bottom); Autodesk, Inc., pp. 2 (top), 46 (bottom), 290, 291, 509, 547 (top); Luz Bueno, Berkeley, California, pp. 3 (bottom), 162, 163 (bottom), 401 (bottom); Sheriann Ki-Sun Burnham, p. 479 (bottom); Fractal landscape generated by computer from the decimal expansion of pi, Gregory and David Chudnovsky, Columbia University

BRIEF CONTENTS

PART ONE
Information Age: An Overview of Computing and Computers 1

CHAPTER ONE
Computers in Your World 3

CHAPTER TWO
The Central Processing Unit 47

CHAPTER THREE
Input and Output 81

CHAPTER FOUR
Secondary Storage and File Organization 125

PART TWO
Computer Systems 161

CHAPTER FIVE
Large Computers and Microcomputers 163

CHAPTER SIX
Computer Software 205

CHAPTER SEVEN
Data Communication 243

PART THREE
Information System Concepts 289

CHAPTER EIGHT
Overview of Information Systems 291

CHAPTER NINE
The System Development Life Cycle 323

CHAPTER TEN
File and Database Processing 365

PART FOUR
Microcomputer Application Software 399

CHAPTER ELEVEN
Introduction to Application Software for Microcomputers 401

CHAPTER TWELVE
Word Processors 439

CHAPTER THIRTEEN
Data Managers 479

CHAPTER FOURTEEN
Spreadsheets 509

CHAPTER FIFTEEN
Graphics for Microcomputers 547

CHAPTER SIXTEEN
Microcomputer Communications 583

PART FIVE
Implications of the Information Age 603

CHAPTER SEVENTEEN
Social Concerns 605

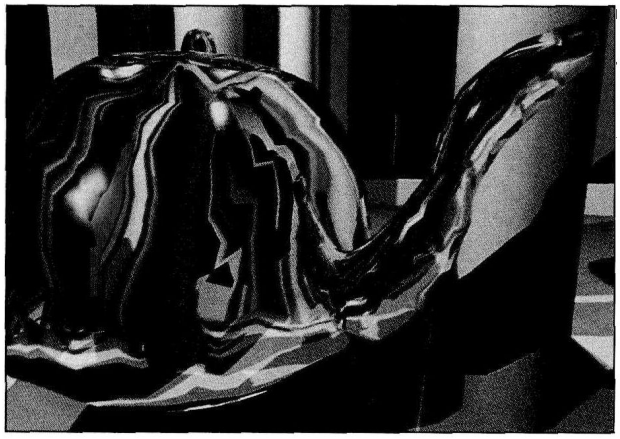
CHAPTER EIGHTEEN
Computers in Your Future 637

APPENDIX A
Structured Programming Concepts 669

APPENDIX B
The BASIC Programming Language 679

CONTENTS

PART ONE
Information Age: An Overview of Computing and Computers 1



CHAPTER ONE
Computers in Your World 3

PROFILE: Raymond Kurzweil 4

THE NEED FOR COMPUTING LITERACY 5

WHAT COMPUTERS ARE 6

HOW WE USE COMPUTERS 8

WHAT COMPUTERS CAN DO 9

Data Processing 8 | Control 8 | HIGHLIGHT 1-1: A Teacher in Over His Head 9 | Design and Development 10 | Data Communication 10

FUNCTIONS OF A COMPUTER 10

HOW COMPUTERS OPERATE 10

WHAT COMPUTERS CANNOT DO 12

COMPUTER SYSTEMS 12

WHERE COMPUTERS ARE USED 13

Business and Industry 13 | Science and Technology 13 | Education 15 | HIGHLIGHT 1-2: Is That a Bug on the Menu? 17 | Government 17 | Legal System 20 | Recreation and Entertainment 21

ABOUT THIS BOOK 24

INFOMODULE: A History of Computers 29

PEOPLE AND THEIR CONTRIBUTIONS 29

Nineteenth-Century Technology 29 | Early-Twentieth-Century Technology 30 | Vacuum-Tube Technology 31 | Chip Technology 35

TECHNOLOGICAL EVOLUTION OF COMPUTERS 39

First Generation (1951–1959) 39 | Second Generation (1959–1965) 39 | Third Generation (1965–1971) 39 | Fourth Generation (1971–present) 43 | Fifth Generation (Future) 43

此为试读,需要完整PDF请访问: www.ertongbook.com

CHAPTER TWO
The Central Processing Unit 47

PROFILE: M. E. (Ted) Hoff 48

THE CENTRAL PROCESSING UNIT 49

The Arithmetic and Logic Unit 51 | The Control Unit 52 | The Main Memory Unit 52

Highlight 2-1: Chips To Live By 54

Highlight 2-2: That's No Rotten Apple! 60

COMMUNICATION PATHWAYS 60

THE CPU AT WORK 62

DATA REPRESENTATION 62

Bits and Bytes 62 | Computer Words 63 | Encoding Systems 64

COMPUTER PROCESSING SPEED 65

Clock Speed 65 | Memory Type 65 | Instruction Set 66 | Data Bus Width 66 | The Microprocessor and Other Support Chips 67

INFOMODULE: Number Systems 72

THE DECIMAL SYSTEM 72

THE BINARY SYSTEM 72

THE OCTAL SYSTEM 74

Converting Octal Numbers to Binary Numbers 74

THE HEXADECIMAL SYSTEM 74

Converting Hexadecimal Numbers to Binary Numbers 76 | Converting Binary Numbers to Hexadecimal Numbers 76

CHAPTER THREE
Input and Output 81

PROFILE: Douglas Engelbart 82

DATA ENTRY CONCEPTS 83

Transcriptive Versus Source Data Entry 83 | On-line/Off-line 83

UPDATING MODES 84

INPUT ACCURACY 84

INPUT DEVICES 85

Keyboard 85 | HIGHLIGHT 3-1: Hand-in Operation 88 | Mouse 88 | Joystick and Trackball 90 | Touch Screen 90 | Light Pen and Digitizer 91 | Voice Recognition Devices 91 | Source-Data Input Devices | 93 HIGHLIGHT 3-2: Fast Facts for Fast Food | 99 Punched Cards and Card Readers 100

OUTPUT DEVICES 101

Hard-Copy Output Devices 101 | Soft-Copy Output Devices | 107

CONNECTIONS 111

INFOMODULE: The Value of Information 117

DATA AND INFORMATION 117

ATTRIBUTES OF INFORMATION 118

SOURCES OF INFORMATION 118

CONCERNS WITH INFORMATION SOURCES 119

INFORMATION MANAGEMENT 120

Information as a Corporate Resource 120 | Information Overload and Information Filtering 121

DETERMINING THE VALUE OF INFORMATION 121

THE IMPACT OF INFORMATION 122

CHAPTER FOUR
Secondary Storage and File Organization 125

PROFILE: John von Neumann 126

CHARACTERISTICS OF SECONDARY STORAGE 127

MAGNETIC TAPE 128

Reel-to-reel Tape 130 | Cassette Tape 130 | Cartridge Tape 131

MAGNETIC DISK 132

Floppy Diskette 132 | HIGHLIGHT 4-1: Memory Futures 136 | Hard Disk 136

OPTICAL TECHNOLOGY 139

Optical Laser Disk 139 | Optical Card 142 | Optical Tape 142

BACKUP 142

Highlight 4-2: Smart Cards 143

DATA ORGANIZATION 144

FILE STORAGE AND ACCESS METHODS 145

Sequential-access File Processing 145 | Direct-access File Processing 146 | Indexed Sequential-access File Processing 147

INFOMODULE: The Care and Handling of Microcomputers 153

ENVIRONMENTAL CONCERNS 153

Temperature 153 | Humidity and Static Electricity 153 | Magnetic Fields 154 | Dust, Smoke, and Other Debris 154

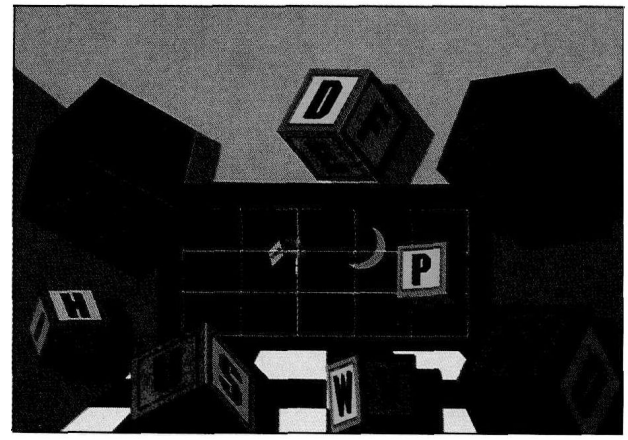
CLEANING AND OTHER TIPS 154

Computer System Unit 154 | Disk Drives 155 | Monitors 155 | Keyboards 155 | Connections 156 | Printers 156 | Diskettes 156

PROTECTION 156

Protecting Software and Data 156 | Equipment, Warranties, Service, and Insurance 157

PART TWO
Computer Systems 161



CHAPTER FIVE
Large Computers and Microcomputers 163

PROFILE: Stephen Wozniak and Stephen P. Jobs 164
CRITERIA FOR CLASSIFYING COMPUTERS 165
SUPERCOMPUTERS 166
Mainframe Computers 168
MINICOMPUTERS 169
MICROCOMPUTERS 170
A MICROCOMPUTER SYSTEM 171
Components of a Microcomputer System 171 | A Multiuser Microcomputer System 172
WHY MICROCOMPUTERS ARE POPULAR 173
BENCHMARKS IN THE MICROCOMPUTER INDUSTRY 175
Highlight 5-1: Historical Hackers 176
MICROPROCESSORS 177
SUPERMICROCOMPUTERS 179
Highlight 5-2: PC Persuasion 180
DESKTOP MICROCOMPUTERS 180
PORTABLE MICROCOMPUTERS 184
Laptop Computers 185 | Handheld Computers 185
THE ISSUE OF COMPATIBILITY 186
INFOMODULE: A Buyer's Guide 193
PREPARATION 193
SELECTING AND EVALUATING SOFTWARE 193
SELECTING A MICROCOMPUTER 195
WARRANTIES 198
USER GROUPS 199
COMPUTER MAGAZINES 199
WHERE TO SHOP 200
Retail Stores 200 | Mail-order Houses 200 | Used-computer Outlets 202 | Other Low-cost Sources of Software 202

CHAPTER SIX
Computer Software 205

PROFILE: William H. Gates 206
SYSTEM SOFTWARE 207
Definition of an Operating System 207 | Parts of an Operating System 208 | Operating System Capabilities 209 | Large-Computer Versus Microcomputer Operating Systems 212 | Focus on Microcomputer Operating Systems 212
APPLICATION SOFTWARE 218
Highlight 6-1: The Wang Freestyle System 219
Types of Application Software 220 | Sources of Application Software 220
Highlight 6-2: Computers in the Courtroom 221
INFOMODULE: Programming Languages—Software Development Tools 226
BASIC INSTRUCTIONS OF A PROGRAMMING LANGUAGE 226
CATEGORIES OF PROGRAMMING LANGUAGES 226
Machine Language 226 | Assembly Language 227 | High-level Language 228 | Fourth-generation Language 229 | Fifth-generation Language 229
PROCEDURAL VERSUS NONPROCEDURAL LANGUAGE 230
OBJECT-ORIENTED PROGRAMMING LANGUAGES 230
MAJOR HIGH-LEVEL LANGUAGES 231
FORTRAN 231 | COBOL 231 | PL/1 232 | BASIC 233 | Pascal and Modula-2 235 | RPG 236 | C 238 | Ada 238 | Other High-level Languages 239
CHOOSING A PROGRAMMING LANGUAGE 239

CHAPTER SEVEN
Data Communication 243

PROFILE: Andrew Fluegelman 244

DATA COMMUNICATION 245

The Effects of Data Communication 245 | Analog and Digital Data Transmission 246 | Modulation, Demodulation, and Modems 246

COMMUNICATION CHANNELS 249

Highlight 7-1: Satellite Communications Help Automakers Gain Competitive Edge 252

Channel Configurations 253 | Channel Sharing 254 | Front-end Processors 255 | Common Carriers 255

RATE OF DATA TRANSMISSION 258

Communication Channel Bandwidths 258 | Asynchronous and Synchronous Transmissions 258

MODES OF TRANSMISSION 259

MICRO-TO-MICRO LINKS 260

MICRO-TO-MAINFRAME LINKS 261

NETWORKS AND DISTRIBUTED DATA PROCESSING 261

Network Topology 261 | HIGHLIGHT 7-2: Networks Provide Lifeline for Medical Center 264 | Wide-area Networks 266 | Local-area Networks 267 | Distributed Data Processing 269 | Cellular Networks 271

COMMUNICATION CHALLENGES 272

DATA COMMUNICATION AT WORK 272

INFOMODULE: Electronic Networks 279

BULLETIN BOARDS 279

How They work 279 | Benefits and Drawbacks 279

ELECTRONIC MAIL 280

How It Works 280 | Benefits and Drawbacks 281

FACSIMILE 281

VOICE MESSAGING 282

TELECONFERENCING 283

INFORMATION SERVICES 283

COMMERCIAL DATABASE SERVICES 284

GATEWAY SERVICES 285

VIDEOTEXT 285

PART THREE
Information System Concepts 289

CHAPTER EIGHT
Overview of Information Systems 291

PROFILE: Grace Murray Hopper 292
WHAT A SYSTEM IS 293
INFORMATION SYSTEMS DEFINED 294
COMPUTER-BASED INFORMATION SYSTEMS 295
Highlight 8-1: Strategic Information Systems 296
FUNCTIONS OF AN INFORMATION SYSTEM 297
Highlight 8-2: Information System Failures 298
MANAGERS AND INFORMATION NEEDS 299
The Roles of Managers 299 | Management Levels and Information Needs 299
TYPES OF INFORMATION SYSTEMS 301
Transaction Processing Systems 301 | Management Information Systems 303 | Decision Support Systems 305 | Executive Support Systems 308
INFOMODULE: Computers and Information Systems in Manufacturing 313
COMPUTER-AIDED DESIGN 314
COMPUTER NUMERICAL CONTROL (CNC) 315
ROBOTICS 316
PROGRAMMABLE CONTROLLERS 318

CHAPTER NINE
The System Development Life Cycle 323

PROFILE: Kenneth Olsen 324
THE LIFE CYCLE OF INFORMATION SYSTEMS 325
REASONS TO DEVELOP NEW INFORMATION SYSTEMS 326
THE SYSTEM DEVELOPMENT LIFE CYCLE 327
Highlight 9-1: IRS's Information System Taxed to the Limit 328
SYSTEM ANALYSIS 331
Problem Definition 332 | Requirements Analysis 332 | Project Justification 333 | System Analysis Tools 334
SYSTEM DESIGN 337
Logical Design Stage 338 | Physical Design Stage 339 | System Design Tools 339
PROTOTYPING AND ITS EFFECTS ON THE SYSTEM DEVELOPMENT LIFE CYCLE 340
AUTOMATING SYSTEM ANALYSIS AND DESIGN 342
SYSTEM IMPLEMENTATION 343
Testing Stage 343 | HIGHLIGHT 9-2: The Battle of the Bugs 344 | Installation Stage 347 | Training Stage 349
SYSTEM MAINTENANCE 349
INFOMODULE: The System Development Life Cycle in a Small Business 355
SYSTEM ANALYSIS 355
SYSTEM DESIGN 356
SYSTEM IMPLEMENTATION 362
SYSTEM MAINTENANCE 362

CHAPTER TEN
File and Database Processing 365

PROFILE: E. F. Codd 366

FILE PROCESSING 367

FILE-MANAGEMENT SYSTEMS 368

Advantages 369 | Disadvantages 369 | Programmable File-management Systems 370

DATABASE PROCESSING 370

How Data Are Stored in Databases 370 | Advantages 371 | Disadvantages 372

DATABASE MANAGEMENT SYSTEMS 372

Highlight 10-1: Atom Smasher's Construction and Operation Rely on a DBMS 373

DATABASE MODELS 374

The Hierarchical Model 374 | The Network Model 375 | The Relational Model 376 | The Object-oriented Model 378

DATABASE DESIGN CONSIDERATIONS 378

Logical Database Design 379 | Physical Database Design 379 | Schema and Subschema 379

MANAGING DATABASES 380

Administering a Database 380 | Appointing a Database Administrator 381 | Maintaining a Data Dictionary 381 | Validating Input 382 | Providing for Backups 382 | Providing for Security and Privacy 382 | HIGHLIGHT 10-2: FBI Database Expansion Seen as Threat to Civil Rights 383 | Controlling Concurrent Operations 383

DISTRIBUTED DATABASES 384

INFOMODULE: Knowledge-based (Expert) Systems 390

HISTORY 390

CONVENTIONAL PROGRAMS VERSUS KNOWLEDGE-BASED SYSTEMS 390

COMPONENTS OF A KNOWLEDGE-BASED SYSTEM 391

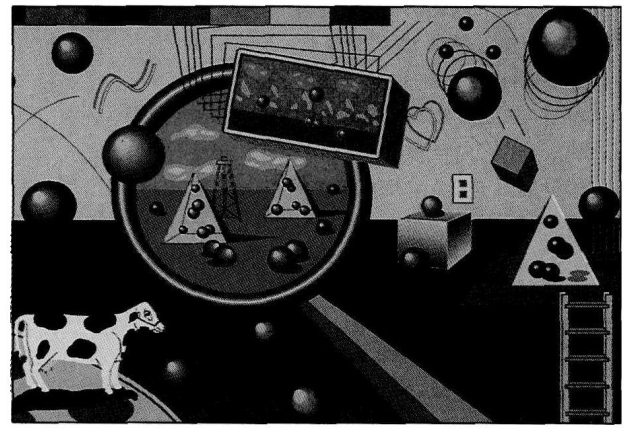
User Interface 391 | Knowledge Base 391 | Inference Engine 392 | Working Memory 392 | Explanation Subsystem 392 | Knowledge-Acquisition System 393

EXPERT SYSTEM SHELLS 393

KNOWLEDGE ENGINEERS 393

USES OF KNOWLEDGE SYSTEMS 393

PART FOUR
Microcomputer Application Software 399



此为试读,需要完整PDF请访问: www.ertongbook.com

CHAPTER ELEVEN
Introduction to Application Software for Microcomputers 401

PROFILE: Dan Bricklin and Bob Frankston 402

MICROCOMPUTER APPLICATION SOFTWARE—A USER PROBLEM SOLVING AND PRODUCTIVITY TOOL 403

Word Processors 403 | HIGHLIGHT 11-1: Digitized Dissection . . . 404 | Data Managers 404 | Electronic Spreadsheets 407 | Graphics 408 | Communications 408

COMPONENTS OF A MICROCOMPUTER SYSTEM USING APPLICATION SOFTWARE 409

EVOLUTION OF MICROCOMPUTER APPLICATION SOFTWARE 410

Highlight 11-2: The Challenge 411

INTEGRATED APPLICATION SOFTWARE 413

Integrated Family of Programs 414 | All-in-One Integrated Packages 415 | Integrated Operating Environment 415 | Background Integration 416

GETTING STARTED USING AN APPLICATION PROGRAM 416

COMMON FEATURES OF MICROCOMPUTER APPLICATION SOFTWARE 417

Interface Features 417 | File-Handling Features 422 | Other Common Application Software Features 423

INFOMODULE: The Automated Office 430

MODERN AUTOMATION 430

WORD PROCESSING 430

DATA PROCESSING AND RETRIEVAL 430

ELECTRONIC MAIL 431

ELECTRONIC CALENDARS 432

ELECTRONIC TELECONFERENCING 432

TELECOMMUTING 432

DESKTOP PUBLISHING 432

INTEGRATION 434

ERGONOMICS AND HUMAN FACTORS 434

CHAPTER TWELVE
Word Processors 439

PROFILE: An Wang 440

WHAT IS WORD PROCESSING? 441

USES AND TYPES 442

Who Uses Word Processors? 443 | Types of Word Processors 444

HOW WORD PROCESSORS WORK 444

Highlight 12-1: Stroke of Genius 445

GETTING STARTED 447

BASIC FEATURES USED TO CREATE A SIMPLE DOCUMENT 449

Text-Editing Features 449 | Formatting Features 450 | Printing Features 454

MANUSCRIPT-PREPARATION FEATURES 456

Footnotes, Endnotes, and Comments 457 | Headers and Footers 457 | Subscripts and Superscripts 457 | Macro 457 | Spelling Checker and Thesaurus 458 | Grammar and Style Checker 458 | Table of Contents, Index, Outliner 459

Highlight 12-2: Computers and Creativity 460

BUSINESS FEATURES 460

Mail Merge 461 | Style Sheet 461 | Line and Paragraph Numbering 461 | Math Functions 461

PAGE LAYOUT FEATURES 462

Newspaper-Style Columns 462 | WYSIWYG or Preview 462 | Type Styles 462

INFOMODULE: Desktop Publishing 468

DEFINITION 468

TRADITIONAL TYPOGRAPHIC PROCESS 468

DOCUMENT CREATION WITH DESKTOP PUBLISHING 468

THE HARDWARE 468

THE SOFTWARE 469

THE PROCESS 470

Creating Text 470 | Desktop Publishing Compared to Word Processing 470 | Creating Graphic Elements 470 | Printing the Publication 473

BUYING CONSIDERATIONS 474

CONCLUSION 475

CHAPTER THIRTEEN
Data Managers 479

PROFILE: C. Wayne Ratliff 480

WHAT IS A DATA MANAGER? 481

File Management Systems 481 | Database Management Systems 481

Highlight 13-1: Picture This! 484

FEATURES OF DATA MANAGERS 484

Entering Commands 484 | Creating a Database 485 | Maintaining the Database 488 | Retrieving and Manipulating Data 488 | Printing 491 | Generating a Report 492 | Graphic Database 492 | Data Security 493

Highlight 13-2: Environmental Database 494

WHAT TO LOOK FOR IN A DATA MANAGER 495

Program Considerations 495 | Product Support 495

INFOMODULE: Hypertext and Multimedia 500

WHAT IS HYPERTEXT? 500

How Hypertext Evolved 501

HYPERTEXT APPLICATIONS 501

HYPERTEXT BASICS 502

Cards and Stacks 502 | Linking Cards 502 | User Levels 502 | Advantages 504 | Disadvantages 504

IMAGE DATABASES 504

MULTIMEDIA 505

CHAPTER FOURTEEN
Spreadsheets 509

PROFILE: Mitchell Kapor 511

WHAT IS A SPREADSHEET? 511

TYPES AND USES 513

GETTING STARTED ON A SPREADSHEET 516

Modes 517 | Typical Worksheet 518 | Control Panel 519 | Status Line 519 | Moving Around the Worksheet 519 | HIGHLIGHT 14-1: Finding Your Way Around 520 | Templates 520 | Defaults 521

BASIC FEATURES USED TO CREATE A SIMPLE WORKSHEET 521

Entering Labels 521 | Entering Numbers 521 | Entering and Displaying Formulas 522 | Correcting Errors/Editing 523 | Defining a Range of Cells 523 | Naming a Range 524 | Recalculating/"What If" Analyses 524 | Saving a Worksheet 525

FORMATTING FEATURES 525

Attributes 525 | Titles 526 | Insert Rows/Columns 526

MANIPULATING FEATURES 526

Copying 527 | HIGHLIGHT 14-2: No Plain Vanilla Spreadsheets Here 528 | Moving 529 | Sorting 529 | Printing 529

ADDITIONAL FEATURES 530

Graphing 530 | Database Functions 530 | Built-in Functions 530

INFOMODULE: Computers in Business 536

MANAGEMENT 536

Project Management 536 | Chart Management 537 | Money Management 537 | Desk Management 538

ACCOUNTING 538

Payroll 538 | Job-Cost Analysis 538 | General Ledger 539 | Tax Reporting 539

BANKING 539

INVESTMENTS 539

SALES 542

MARKETING 543

Advertising 543 | Telemarketing 543

THE COMPUTER: YOUR BUSINESS PARTNER 544

CHAPTER FIFTEEN
Graphics for Microcomputers 547

PROFILE: Augusta Ada, Countess of Lovelace 548

DEFINITION 549

HOW GRAPHICS SOFTWARE WORKS 549

Types of Graphic Images 549 | Modes of Resolution 551 | Input Options 551 | Output Options 551

USES AND TYPES OF GRAPHICS SOFTWARE 552

Highlight 15-1: PC Meets TV 553

Paint and Draw Programs 554 | Design Programs 554 | Chart/Graph Programs and Presentation Graphics Programs 556

FEATURES OF GRAPHICS SOFTWARE 559

Chart/Graph Types 560 | Slide Show 563 | Image Manipulation 563 | HIGHLIGHT 15-2: Graphics on Trial 564 | Template 565 | Grid 565 | Fill Pattern 565 | Color 565 | Text 565 | Kerning 566 | Zoom 566 | Pan 566 | Mirror 566 | 3-D 566 | Animation 566 | Picture Library 567

CREATING BUSINESS GRAPHS AND CHARTS 567

Simplicity 567 | Accuracy 567 | Visual Impact 568

INFOMODULE: Computer Graphics in Use 574

GRAPHICS UNLIMITED 574

SIMULATION AND TRAINING 574

GRAPHIC ART 575

Commercial Art and Illustration 575 | Clip Art 576 | Fine Art 576 | Animation 577

GRAPHICS IN MEDICINE 577

PRODUCT DESIGN 577

CONCLUSION 581

CHAPTER SIXTEEN
Microcomputer Communications 583

PROFILE: Edsger Dijkstra 584

COMMUNICATION BASICS 585

Setting Communication Parameters 585 | HIGHLIGHT 16-1: Time to Call Home 586 | Emulating a Dumb Terminal 587

APPLICATION OF COMMUNICATION SOFTWARE 588

MAKING THE CONNECTION 588

Command Mode 589 | Data-Transfer Mode 589 | Automatic Dialing 590 | Autoanswer 590 | Automatic Message Transfer 590 | Pacing Option 590

DATA CAPTURE 590

FILE TRANSFER 591

Transferring a File 591 | File-Transfer Protocols 592

Highlight 16-2: The NYSE and Telecommunication 593

ADDITIONAL FEATURES 594

Macros 594 | File Protection 594 | Error Handling 594 | Character Stripping 594 | Break Signal 594 | Time On-Line Status 594

INFOMODULE: Case Study: Putting It All Together 598

APPLICATION SOFTWARE USE IN THE ACCOUNTING DEPARTMENT 598

APPLICATION SOFTWARE USE BY THE DESIGN STAFF 598

APPLICATION SOFTWARE USE BY THE MANAGEMENT STAFF 598

APPLICATION SOFTWARE USE BY THE CLERICAL STAFF 599

APPLICATION SOFTWARE USE IN THE PREPARATION OF A BID 599

CHAPTER EIGHTEEN
Computers in Your Future 637

PROFILE: Alan M. Turing 638
DIRECTIONS IN TECHNOLOGY 639
Artificial Intelligence 640 | HIGHLIGHT 18-1: Focus on Fuzzy Logic 642 | HIGHLIGHT 18-2: Lights! Camera! Action! 644 | Neural Networks 647 | Josephson Junction 647 | Parallel Processing 647 | Chips 648 | Optoelectronics 653 | Communication Technology 653 | Software Innovations 654
THE INTERNATIONAL SCENE 656
SOCIETY'S RESPONSE AND THE GLOBAL VILLAGE 658
INFOMODULE: Careers in an Information Age 664
SYSTEM ANALYST 664
PROGRAMMER 664
COMPUTER OPERATOR 664
DATA-ENTRY OPERATOR 665
COMPUTER SERVICE TECHNICIAN 665
DATABASE ADMINISTRATOR 665
INFORMATION SYSTEM MANAGER 665
INFORMATION SERVICE CENTER CONSULTANT 666
OTHER COMPUTER-RELATED CAREERS 666
HOW COMPUTERS AFFECT OTHER JOBS 666

APPENDIXES

APPENDIX A
Structured Programming Concepts 669

APPENDIX B
The BASIC Programming Language 679

Glossary 727

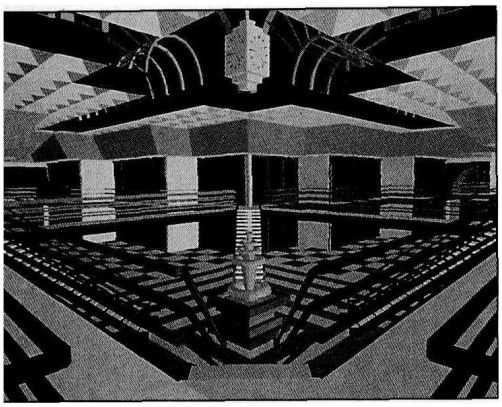
Index 751

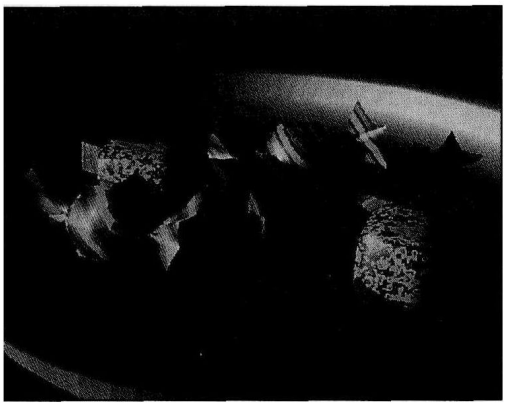
PART ONE

Information Age: An Overview of Computing and Computers

In my opinion, the future will see computers and humans, each representing totally different forms of intelligence, working in cooperation rather than in competition and accomplishing more together than either could possibly achieve alone.

Isaac Asimov, science fiction writer





OUTLINE

THE NEED FOR COMPUTING LITERACY

WHAT COMPUTERS ARE

HOW WE USE COMPUTERS

WHAT COMPUTERS CAN DO

Data Processing | Control | Design and Development | Data Communication

FUNCTIONS OF A COMPUTER

HOW COMPUTERS OPERATE

WHAT COMPUTERS CANNOT DO

COMPUTER SYSTEMS

WHERE COMPUTERS ARE USED

Business and Industry | Science and Technology | Education | Government | Legal System | Recreation and Entertainment

ABOUT THIS BOOK

INFOMODULE: A HISTORY OF COMPUTERS

PEOPLE AND THEIR CONTRIBUTIONS

Nineteenth-Century Technology | Early-Twentieth-Century Technology | Vacuum-Tube Technology | Chip Technology

TECHNOLOGICAL EVOLUTION OF COMPUTERS

First Generation (1951–1959) | Second Generation (1959–1965) | Third Generation (1965–1971) | Fourth Generation (1971–Present) | Fifth Generation (Future)

OBJECTIVES

- ☐ Describe the importance of understanding and being able to take advantage of computing technology.
- ☐ Describe what a computer is and give examples of how computers are used.
- ☐ Identify four basic ways in which computers are used.
- ☐ Recognize the three tasks that computers perform.
- ☐ Identify the flow of data.
- ☐ Distinguish between what computers can and cannot do.
- ☐ Identify the components of a computer system.
- ☐ Grasp the scope of where computers are found.

此为试读,需要完整PDF请访问: www.ertongbook.com