



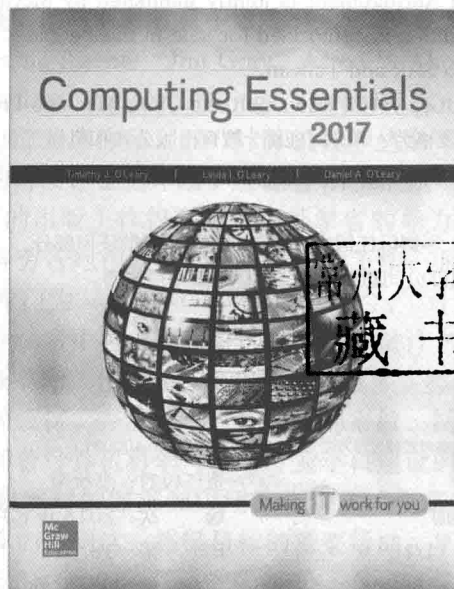
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(2017英文精编版)

*Computing Essentials 2017*

Making IT Work for You (English Abridgement Edition)



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# 出版者的话

文艺复兴以来，源远流长的科学精神和逐步形成的学术规范，使西方国家在自然科学的各个领域取得了垄断性的优势；也正是这样的优势，使美国在信息技术发展的六十多年间名家辈出、独领风骚。在商业化的进程中，美国的产业界与教育界越来越紧密地结合，计算机学科中的许多泰山北斗同时身处科研和教学的最前线，由此而产生的经典科学著作，不仅擘划了研究的范畴，还揭示了学术的源变，既遵循学术规范，又自有学者个性，其价值并不会因年月的流逝而减退。

近年，在全球信息化大潮的推动下，我国的计算机产业发展迅猛，对专业人才的需求日益迫切。这对计算机教育界和出版界都既是机遇，也是挑战；而专业教材的建设在教育战略上显得举足轻重。在我国信息技术发展时间较短的现状下，美国等发达国家在其计算机科学发展的几十年间积淀和发展的经典教材仍有许多值得借鉴之处。因此，引进一批国外优秀计算机教材将对我国计算机教育事业的发展起到积极的推动作用，也是与世界接轨、建设真正的世界一流大学的必由之路。

机械工业出版社华章公司较早意识到“出版要为教育服务”。自1998年开始，我们就将工作重点放在了遴选、移译国外优秀教材上。经过多年的不懈努力，我们与Pearson, McGraw-Hill, Elsevier, MIT, John Wiley & Sons, Cengage等世界著名出版公司建立了良好的合作关系，从他们现有的数百种教材中甄选出Andrew S. Tanenbaum, Bjarne Stroustrup, Brian W. Kernighan, Dennis Ritchie, Jim Gray, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Abraham Silberschatz, William Stallings, Donald E. Knuth, John L. Hennessy, Larry L. Peterson等大师名家的一批经典作品，以“计算机科学丛书”为总称出版，供读者学习、研究及珍藏。大理石纹理的封面，也正体现了这套丛书的品位和格调。

“计算机科学丛书”的出版工作得到了国内外学者的鼎力相助，国内的专家不仅提供了中肯的选题指导，还不辞劳苦地担任了翻译和审校的工作；而原书的作者也相当关注其作品在中国的传播，有的还专门为其书的中译本作序。迄今，“计算机科学丛书”已经出版了近两百个品种，这些书籍在读者中树立了良好的口碑，并被许多高校采用为正式教材和参考书籍。其影印版“经典原版书库”作为姊妹篇也被越来越多实施双语教学的学校所采用。

权威的作者、经典的教材、一流的译者、严格的审校、精细的编辑，这些因素使我们的图书有了质量的保证。随着计算机科学与技术专业学科建设的不断完善和教材改革的逐渐深化，教育界对国外计算机教材的需求和应用都将步入一个新的阶段，我们的目标是尽善尽美，而反馈的意见正是我们达到这一终极目标的重要帮助。华章公司欢迎老师和读者对我们的工作提出建议或给予指正，我们的联系方式如下：

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华章科技图书出版中心

The 20th century brought us the dawn of the digital information age and unprecedented changes in information technology. In fact, the rate of change is clearly increasing. As we begin the 21st century, computer literacy is undoubtedly becoming a prerequisite in whatever career you choose.

The goal of *Computing Essentials* is to provide you with the basis for understanding the concepts necessary for success. *Computing Essentials* also endeavors to instill an appreciation for the effect of information technology on people, privacy, ethics, and our environment and to give you a basis for building the necessary skill set to succeed in the 21st century.

Times are changing, technology is changing, and this text is changing too. As students of today, you are different from those of yesterday. You put much effort toward the things that interest you and the things that are relevant to you. Your efforts directed at learning application programs and exploring the web seem, at times, limitless. On the other hand, it is sometimes difficult to engage in other equally important topics such as personal privacy and technological advances.

At the beginning of each chapter, we carefully layout why and how the chapter's content is relevant to your life today and critical to your future. Within each chapter, we present practical tips related to key concepts through the demonstration of interesting applications that are relevant to your lives. Topics presented focus first on outputs rather than processes. Then, we discuss the concepts and processes.

Motivation and relevance are the keys. This text has several features specifically designed to engage and demonstrate the relevance of technology in your lives. These elements are combined with a thorough coverage of the concepts and sound pedagogical devices.







# Unique Content

## MAKING IT WORK FOR YOU

Making IT work for you

### FREE ANTIVIRUS PROGRAM


Have you or someone you know had a pleasant computing experience due to a spyware infection? Even about a decade ago, most users of software were cautious, protected information, or viewed a viral infection as a nuisance at best. Most of these problems can be solved by having an up-to-date antivirus program installed on your computer's operating system. This interactive program has to scan and update a free antivirus program if the computer user has problems. (You will be able to do this work in a continuous manner, and some of the specific processes before may be changed.)

**Getting Started:** First, make sure your computer does not have an antivirus or security suite running. If it does, be sure to completely uninstall that program, even if the subscription is expired. Then, follow these steps to install AVG, a popular, free antivirus program.

1. Visit <http://free.avg.com> and click the Download button. You will be asked to confirm that you want the free edition and then redirected to a download site.
2. Run the installation file and follow the prompts.
3. Select basic protection if you are asked which product you would like to install.

**Using AVG:** Generally speaking, your antivirus program watches your system for malware and updates itself automatically. However, you can change download updates manually, set a schedule for full system scans, and change basic settings for various components of the software.

1. Click Scan now to run a full scan on your computer.
2. Just to the right of that, click the button with the white cog to see the scan options where you can set a schedule for automated scans.
3. Click the back arrow to reach the main screen, where you can click various elements of the program to configure them. For example, clicking HWD will allow you to turn on a feature that detects links that may be used to track your online activity.



Special-interest topics are presented in the Making IT Work for You section found within nearly every chapter. These topics include Installing a Free Antivirus Program, Online Entertainment, Google Docs, Skype, and Cloud Storage.

Nearly every chapter has a Privacy box located in the margin adjacent to the coverage of related technologies. Topics include protecting personal information when using a free Wi-Fi network or when disposing of an outdated computer.

Nearly every chapter has an Ethics box located in the margin adjacent to the coverage of related technologies. Topics include proper disposal of older CRT monitors, empty inkjet cartridges, and old computers.

Nearly every chapter has an Environment box located in the margin adjacent to the coverage of related technologies. Topics include plagiarism of online materials, editing images to promote a particular message, and the use of monitoring software.

## PRIVACY, ETHICS, AND ENVIRONMENT

### privacy

Did you know that one type of specially processed or filtered information is known as metadata? Called organizations with these technologies perform encoding and decoding of data based on their security, not a CPU. These specialized chips are in ATMs, TV set-top boxes, and smartphones.



Figure 5-30 Chip mounted onto a chip carrier

### ethics

Most agree that it is ethical and prudent to shield young children from violence or sexual material content by using software that filters such content. Some parents of older children have installed computer monitoring software that records all their children's Internet activity.

They believe this is warranted because they wish to know what their kids are doing online. Do you believe it is ethical of parents to do this?

networking card plugs into a slot on the system board to provide a connection to a local area network.

- Connecting lines called bus lines provide pathways that support communication among the various electronic components that are either located on the system board or attached to the system board.

Generally, the system board found on a desktop is larger than that found on a laptop, and much larger than one found on a tablet, smartphone, or wearable computer. Although these systems handle very little data, they nevertheless all perform the same function of communicating between the components of the personal computer.

### concept check

- 1. What is the system board, and what does it do?
- 2. Define and describe network, slots, and bus lines.
- 3. What are chips? How are chips attached to the system board?

### Microprocessor

In most personal computer systems, the central processing unit (CPU) or processor is contained on a single chip called the microprocessor. The microprocessor is the "brains" of the computer system. It has two basic components: the control unit and the arithmetic-logic unit.

- **Control unit:** The control unit tells the rest of the computer system how to carry out a program's instructions. It directs the movement of electronic signals between memory, which temporarily holds data, instructions, and processed information, and the arithmetic-logic unit. It also directs these control signals between the CPU and input and output devices.

- **Arithmetic-logic unit:** The arithmetic-logic unit, usually called the ALU, performs two types of operations: arithmetic and logical. **Arithmetic operations** are the fundamental math operations: addition, subtraction, multiplication, and division. **Logical operations** consist of comparisons such as whether one item is equal to (<=), less than (<), or greater than (>) the other.

### environment

Have you ever wondered what you should do with your old computer equipment? Consider donating them to charitable organizations that work with low-income and low-income families. Or, recycle them. Many computer retailers and local government agencies accept recycled equipment.

# Unique End-of-Chapter Discussion Materials

## MAKING IT WORK FOR YOU

Making IT Work for You discussion questions are carefully integrated with the chapter's Making IT Work for You topics. The questions facilitate in-class discussion or written assignments focusing on applying specific technologies into a student's day-to-day life. They are designed to expand a student's awareness of technology applications.

## PRIVACY

Privacy discussion questions are carefully integrated with the chapter's marginal Privacy box. The questions facilitate in-class discussion or written assignments focusing on critical privacy issues. They are designed to develop a student's ability to think critically and communicate effectively.

**DISCUSSION**

Respond to each of the following questions.

**1 Making IT Work for You: ONLINE ENTERTAINMENT**

Review the Making IT Work for You Online Entertainment on pages 20–31, and then respond to the following: (a) Do you currently have a subscription to Netflix, Hulu, Hulu Plus, or another service that allows you to stream movies and TV shows? If so, which ones? If not, do you plan on using one in the future? Why or why not? (b) What device do you use most often to watch video content from the web? Would you consider purchasing a dedicated streaming device such as the Roku? Why or why not? (c) Could you see yourself cancelling or "flipping the cord" from your current cable or satellite service? Why or why not?



**2 Privacy: SOCIAL NETWORKING**

When a Facebook friend posts a picture, video, or text that includes you, who can view that post? Review the Privacy box on page 40, and respond to the following: (a) Who should be responsible for ensuring privacy on social networking sites? Defend your position. (b) Do you think that most people are aware of their privacy settings on Facebook? Have you ever checked your settings? Why or why not? (c) Investigate and then summarize the default security settings for a social networking website such as Facebook or Google+.




## ETHICS

Ethics discussion questions are carefully integrated with the chapter's marginal Ethics boxes. The questions facilitate in-class discussion or written assignments focusing on ethical issues relating to technology. They are designed to develop a student's ability to think critically and communicate effectively.


**3 Ethics: FILTERING AND MONITORING**

Parents can use content filters and monitoring software to restrict or monitor their child's Internet behavior. Review the Ethics box on page 35, and respond to the following: (a) Is it ethical for parents to filter or monitor Internet content for their children? Does your answer depend on the age of the child? Defend your position. (b) Should parents inform their children that Internet activity is being filtered or monitored? Why or why not? (c) Do you feel that filtering or monitoring software is the best way to protect children? Defend your position.



**4 Environment: E-MAIL**

Review the Environment box on page 37, and then respond to the following: (a) When it comes to sending letters, holiday cards, and invitations to friends and family, do you mostly use e-mail or postal mail? What are your reasons for choosing one over the other? (b) Are there any situations where you feel that using e-mail would be inappropriate? (c) Have you signed up for paperless billing from your financial institutions and utility companies? Why or why not? (d) Do you go through all the paper mail you have received in the last week or two. Is there anything there that you could receive via e-mail or view on the web? If so, list a few examples.



## ENVIRONMENT

Environment discussion questions are carefully integrated with the chapter's marginal Environment boxes. The questions facilitate in-class discussion or written assignments focusing on environmental issues relating to technology. They are designed to develop a student's ability to think critically and communicate effectively.



# Reinforcing Key Concepts

## CONCEPT CHECKS

Located at points throughout each chapter, the Concept Check cues you to note which topics have been covered and to self-test your understanding of the material presented.



### concept check



- What is the difference between the Internet and the web?
- Describe how the Internet and the web started. What are the three web generations?
- List and describe five of the most common uses of the Internet and the web.

## KEY TERMS

Throughout the text, the most important terms are presented in bold and are defined within the text. You will also find a list of key terms at the end of each chapter and in the glossary at the end of the book.

### KEY TERMS

address (15, 37)  
Advanced Research Project Agency Network (ARPANET) (24)  
AJAX (33)  
application (39)  
attachment (37)  
BitTorrent (33)  
blog (81)  
browser (32)  
business-to-business (B2B) (45)  
business-to-consumer (B2C) (44)  
cable (52)  
canceling a file share (KSS) (33)  
Circle (105)  
client-based e-mail system (36)  
cloud computing (46)  
consumer-to-consumer (C2C) (44)  
digital cash (45)  
domain name (33)  
downloading (33)  
DOS (32)  
e-commerce (46)  
e-learning (37)  
electronic transaction (46)  
electronic mail (37)  
e-mail (37)  
e-mail client (36)  
Facebook (39)  
Facebook groups (42)  
Facebook Pages (42)  
Facebook Profile (40)  
file transfer protocol (FTP) (35)  
filter (34)  
flamed (39)  
Google+ (40)  
Google Plus (40)  
Hampton (60)  
header (37)  
hit (45)  
Hypertext (33)  
Hypertext Markup Language (HTML) (33)  
instant messaging (IM) (39)  
Internet (24)  
Internet of Things (IoT) (47)  
Internet security suite (24)  
Internet service provider (ISP) (42)  
LinkShare (33)  
link (33)  
LinkShare (40)  
location (38)  
message (37)  
metadata (41)  
MMS (multimedia messaging service) (36)  
mobile browser (33)  
router (28)  
plug-in (34)  
protocol (32)  
protected (33)  
search engine (43)  
search service (43)  
secure file transfer protocol (SFTP) (35)  
signature (37)  
SPAM (spam filtering service) (36)  
social networking (39)  
spam (36)  
spam blocker (36)  
spam filter (36)  
specialized search engine (43)  
spybot (43)  
steering (43)  
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website (41)  
web log (41)  
website (39)  
web browser (46)  
web page (33)  
web suite (33)  
web utility (34)  
wiki (42)  
Wikipedia (42)  
wireless modem (32)  
World Wide Web (W3) (28)  
WWW (28)

## CHAPTER REVIEW

Following the Visual Summary, the chapter review includes material designed to review and reinforce chapter content. It includes a key terms list that reiterates the terms presented in the chapter, multiple-choice questions to help test your understanding of information presented in the chapter, matching exercises to test your recall of terminology presented in the chapter, and open-ended questions or statements to help review your understanding of the key concepts presented in the chapter.

### MULTIPLE CHOICE

Circle the correct answer.

- The network that connects computers all over the world.  
a. ARPANET c. LAN  
b. Internet d. web
- The rules for exchanging data between computers.  
a. DSL c. web  
b. protocols d. WWW
- Using file transfer utility software, you can copy files to your computer from specially configured servers on the Internet. This is called:  
a. downloading c. blogging  
b. filtering d. uploading
- Communities of individuals who share a common interest typically create Facebook:  
a. clients c. Pages  
b. groups d. Profiles
- Type of e-mail account that does not require an e-mail program to be installed on a user's computer is:  
a. blog-based c. utility-based  
b. client-based d. web-based
- The most popular microblogging sites:  
a. LinkedIn c. Twitter  
b. Google+ d. Wikipedia
- Using a keyword, a search engine returns a list of related sites known as:  
a. blogs c. podcasts  
b. hits d. strikes
- This is the Internet's equivalent to traditional cash:  
a. digital cash c. flip  
b. e-commerce d. Internet dollars
- The continuing Internet development that allows objects to send and receive data over the Internet:  
a. HTML c. search engines  
b. IoT d. Web 2.0
- Three basic components to cloud computing are clients, Internet, and \_\_\_\_\_.  
a. CSS c. streaming  
b. service providers d. Web 3.0



# Acknowledgments

---

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# About the Authors

---

Tim and Linda O'Leary live in the American Southwest and spend much of their time engaging instructors and students in conversation about learning. In fact, they have been talking about learning for over 25 years. Something in those early conversations convinced them to write a book, to bring their interest in the learning process to the printed page. Now, they are joined by their son Dan O'Leary as a coauthor. Dan has recently completed his PhD in Electrical Engineering with significant experience in teaching and consulting in information technology.



The O'Leary's form a unique team blending experience and youth. Tim has taught courses at Stark Technical College in Canton, Ohio, and at Rochester Institute of Technology in upstate New York, and is currently a professor emeritus at Arizona State University. Linda offered her expertise at ASU for several years as an academic advisor. She also presented and developed materials for major corporations such as Motorola, Intel, Honeywell, and AT&T, as well as various community colleges in the Phoenix area. Dan has taught at the University of California at Santa Cruz, developed energy-related labs at NASA, and worked as a database administrator and as a consultant in information systems.

Tim, Linda, and Dan have talked to and taught numerous students, all of them with a desire to learn something about computers and applications that make their lives easier, more interesting, and more productive.

Each new edition of an O'Leary text, supplement, or learning aid has benefited from these students and their instructors who daily stand in front of them (or over their shoulders).

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