大学计算机教育丛书（影印版）

Student Solutions Manual

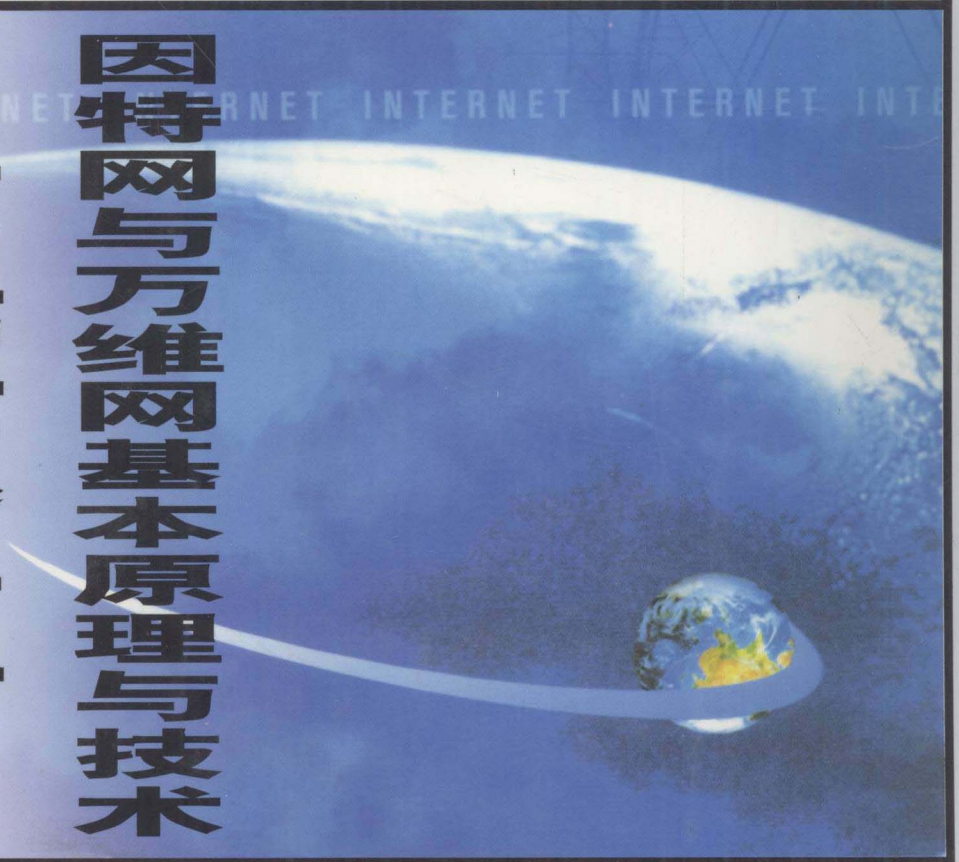
to accompany

In-line / On-line:

Fundamentals of the Internet and the World Wide Web

Raymond Greenlaw，Ellen Hepp

因特网与万维网基本原理与技术学生解题手册



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In-line/On-line: Fundamentals of the Internet and the World Wide Web

因特网与万维网基本原理与技术

学生解题手册

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出版者的话

今天，我们的大学生、研究生和教学、科研工作者，面临的是一个国际化的信息时代。他们将需要随时查阅大量的外文资料；会有更多的机会参加国际性学术交流活动；接待外国学者；走上国际会议的讲坛。作为科技工作者，他们不仅应有与国外同行进行口头和书面交流的能力，更为重要的是，他们必须具备极强的查阅外文资料获取信息的能力。有鉴于此，在原国家教委所颁布的“大学英语教学大纲”中有一条规定：专业阅读应作为必修课程开设。同时，在大纲中还规定了这门课程的学时和教学要求。有些高校除开设“专业阅读”课之外，还在某些专业课拟进行英语授课。但教、学双方都苦于没有一定数量的合适的英文原版教材作为教学参考书。为满足这方面的需要，我们陆续精选了一批国外计算机科学方面最新版本的著名教材，进行影印出版。我社获得国外著名出版公司和原著作者的授权将国际先进水平的教材引入我国高等学校，为师生们提供了教学用书，相信会对高校教材改革产生积极的影响。

我们欢迎高校师生将使用影印版教材的效果、意见反馈给我们，更欢迎国内专家、教授积极向我社推荐国外优秀计算机教育教材，以利我们将《大学计算机教育丛书（影印版）》做得更好，更适合高校师生的需要。

清华大学出版社

《大学计算机教育丛书（影印版）》项目组

1999.6

Preface

The purpose of this student solutions manual is to

- provide students with solutions to the odd-numbered problems contained in "In-line/On-line: Fundamentals of the Internet and World Wide Web"
- provide some supplemental material for students (contained in the answers to the exercises)

Since it is not possible for instructors to provide answers for nor grade all of the problems in In-line/On-line, you can use this solutions manual to check some of your own work and to find answers to problems that you didn't have the time to solve. Ultimately, we believe you will be able to learn more about the Internet and World Wide Web by having access to this manual.

In-line/On-line Exercises

We designed the exercises in In-line/On-line to have you practice basic skills, to get you to apply what you have learned, to challenge you and to encourage you in experimenting and using your creativity, to promote thinking along the lines of a computer scientist, and to practice writing. In this solutions manual we present solutions to all of the exercises odd numbered exercises in In-line/On-line. The level of detail provided for the problems varies. We often provide a complete stand-alone answer. In some cases we provide a partial answer and directions for solving the problem, along with hyperlinks to locations where the information required to solve the exercise can be found. HTML code is provided for a number of problems and we recommend you experiment with our answers.

For many of the exercises a wide range of answers is possible. In such cases we usually begin by providing a sample answer. Since the information on the Web changes so quickly, in many cases we present a caution such as "As of this writing," meaning that the information given in the answer was current when we wrote this solutions manual but has likely changed since then. The problems in In-line/On-line range from very easy to very hard, and it is sometimes not

immediately evident where an exercise fits in along this continuum—so proceed with caution.

Organization of this Solutions Manual

This solutions manual contains 14 chapters, a section for writing down URLs, and a section for Notes. The 14 chapters correspond directly to those in In-line/On-line.

Suggestions and Corrections

This solutions manual may contain errors. In anticipation of possible future printings, we would like to correct them and incorporate as many of your suggestions as possible. Please send comments to us via e-mail at

ehepp@cisunix.unh.edu or **greenlaw@pirates.armstrong.edu**

Corrigenda and additions to In-line/On-line and the student solutions manual can be found at

www.cs.armstrong.edu/greenlaw

and then by following the links to In-line/On-line **Updates**. These updates will also be installed on the McGraw-Hill Web site.

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Our sincere thanks to Laurel Greenlaw for proofreading this solutions manual and for tracking down the answers to a number of questions. This project would not have turned out so well without her significant contributions, and would not have been completed on-time without her support.

Thanks to Betsy Jones and Emily Gray for their continued support and assistance with this project.

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Finally, thanks to "Killface" the cat, who tolerated being pampered a little less, during the time when this manual was being written.

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May 1999

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Contents

Chapter 1

Fundamentals of Electronic Mail

Exercises 1.2 E-mail: Advantages and Disadvantages

1. **Write a paragraph or two aimed at someone who was around before the advent of computers. Describe your idea about e-mail for the future, including how and why you see it becoming popular and universal.**

   Answers to this exercise will vary. Here is a sample answer.

   "E-mail" is a way to communicate with someone located just about anywhere in the world. It is just like writing a letter except that there is no paper and it takes no time at all to deliver. Instead of paper and pen, the "electronic letter" is typed using a special machine; the person receiving the letter needs a similar machine. These machines are "computers" and in order to send e-mail, they need to be connected together somehow. Sending e-mail from one computer to another does not require that the computers be connected directly to each other. They are part of a much larger group of computers that are all connected together. We call this very large group of connected computers the "Internet" and one of the Internet's functions is to transmit e-mail. Think of the computers as being connected together like telephones and sending an electronic message like making a phone call.

   E-mail uses the Internet to "deliver" electronic letters almost anywhere. We say "almost" because there are still some places where the Internet does not extend to or where people do not have computers. We expect the Internet to continue to expand rapidly over time. We also expect e-mail to become extremely popular in the future because it is convenient, fast, and inexpensive.

3. **Describe one good and one bad experience that you or someone you know has had with e-mail.**

   A good experience that we had with e-mail involved being able to get the word out about a change in plans without having to contact each person separately. Since all eleven people involved had e-mail accounts and regularly checked their mailboxes, we were able to compose one e-mail message and send it (once) to every person on our *distribution list.* This e-mail feature saved us a lot of time and more than once.

   A bad experience we had with e-mail involved accidently responding to everyone on a distribution list instead of just the person who sent the e-mail message. This was extremely embarrassing since the response was of a personal nature. We will spare you (and us) the details.

5. **Have you ever received spam? If so, what was the nature of the message?**

   Yes, we have received spam. Most of it has involved "get rich quick scams" and insurance offers.

Exercises 1.3 Userids, Passwords, and E-Mail Addresses

7. **(This problem requires discrete mathematics.) If you are allowed to have passwords consisting of only five lowercase letters, how many possible passwords are there? What if we also allow uppercase letters in combination with lowercase letters? Now, suppose we allow digits (0–9), as well as uppercase and lowercase letters. How many different passwords are possible of lengths five, six, and seven characters? (Factoid: Some operating systems allow passwords of up to 31 characters long.)**

   In the first case the passwords consist of exactly five lowercase letters. Since there are 26 possible lowercase letters to choose from, there will be 26^5 or $11,881,376$ possible passwords. That is, there are 26 choices for the first letter, 26 choices for the second letter independent of the first letter, and so on. If shorter passwords are permitted as well, there are

   $$26^1 + 26^2 + 26^3 + 26^4 + 26^5$$

   or $12,356,630$ possible passwords having lengths less than or equal to five.

   If uppercase letters are allowed in addition to lowercase letters, there are 52 possible characters to choose from in creating the password. So, there are 52^5 or $380,204,032$ possible unique passwords that are exactly 5 characters long. If shorter passwords are permitted, there are

   $$52^1 + 52^2 + 52^3 + 52^4 + 52^5$$

   or $387,659,012$ possibilities.

If we allow the digits (0–9) as well as upper and lowercase letters, there are 62^5 or 916, 132, 832 possible unique passwords that are exactly 5 characters long. Allowing shorter passwords makes

$$62^1 + 62^2 + 62^3 + 62^4 + 62^5$$

or 931, 151, 402 password possibilities.

If the passwords are permitted to be either five, six, or seven characters long, we obtain the following:

Allowing characters a–z

$$26^5 + 26^6 + 26^7$$

or 8, 352, 607, 328 possibilities. Each term in this sum corresponds to passwords of a single length, for example, 26^6 represents the number of passwords of length 6.

Allowing characters a–z and A–Z

$$52^5 + 52^6 + 52^7$$

or 1, 048, 222, 516, 224 possibilities.

Allowing characters a–z and A–Z and 0–9

$$62^5 + 62^6 + 62^7$$

or 3, 579, 330, 974, 624 possibilities.

Notice this last number is over half of the population of earth.

An unabridged dictionary may have 100,000 different words in it. Notice how many more combinations there are than English words even when we only allow "short" passwords. This illustrates the importance of not choosing a word in the dictionary as a password because relatively speaking, there are not that many different words in a dictionary.

9. **A computer *algorithm* (which is really just a set of specific rules) for automatic userid generation follows these sequential rules:**

   (a) Last name, or

   (b) First initial, last name, or

   (c) First, middle (if there is one), and last initial, or

   (d) First, middle (if there is one), and last initial, followed by a counter that starts at 2.

Note that all account names are lowercase. If the following users were the first people added to the system in sequence, what userids would they have: John Allen, Eleanor Allen, Kendra Allen, Shirley Allen, John Allen, John K. Allen, Johnny Allen, Joseph Allen, Joseph Mike Allen, Mark Allen, Marcus Allen, Robert John Allen, Jill Kendra Allen? Do you see any problems with the automatic userid generating algorithm? Why do you suppose computer operators use such algorithms?

Here are the account names that would be assigned.

John Allen — allen

Eleanor Allen — eallen

Kendra Allen — kallen

Shirley Allen — sallen

John Allen — jallen

John K. Allen — jka

Johnny Allen — ja

Joseph Allen — ja2

Joseph Mike Allen — jma

Mark Allen — mallen

Marcus Allen — ma

Robert John Allen — rallen

Jill Kendra Allen — jka2

Sometimes userids that are generated automatically are hard to remember and/or are not associated in name with the person who owns them. For example, Barbara McCoy might end up with a userid of `abcd5612`. This makes it impossible to make a correct, educated guess as to what someone's e-mail address might be.

Computer operators use automatic userid generating algorithms to save time in establishing new accounts. If several hundred new accounts need to be added to a system, it is probably not practical to add them all by hand.

11. **This exercise should make you aware of the number of countries currently using e-mail. Put together a list of *all* top-level country code domain names, not just those listed in the text. Are they all two letters long? How many different countries could you locate?**

All of the country codes we encountered were two letters long.

As of this writing, here is a list of all 243 country codes. Check on-line to

see the most current version of the list. For example, see

`www.thrall.org/domains.htm`

AD Andorra
AE United Arab Emirates
AF Afghanistan
AG Antigua and Barbuda
AI Anguilla
AL Albania
AM Armenia
AN Netherlands Antilles
AO Angola
AQ Antarctica
AR Argentina
AS American Samoa
AT Austria
AU Australia
AW Aruba
AZ Azerbaijan
BA Bosnia and Herzegovina
BB Barbados
BD Bangladesh
BE Belgium
BF Burkina Faso
BG Bulgaria
BH Bahrain
BI Burundi
BJ Benin
BM Bermuda
BN Brunei Darussalam
BO Bolivia
BR Brazil
BS Bahamas
BT Bhutan
BV Bouvet Island
BW Botswana
BY Belarus
BZ Belize
CA Canada
CC Cocos (Keeling) Islands
CF Central African Republic
CG Congo
CH Switzerland
CI Cote D'Ivoire (Ivory Coast)
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