Exam 2
Answer Key
Fall 2006

Multiple Choice.

1.   d
2.   d
3.   a
4.   d
5.   d
6.   c
7.   a
8.   c
9.   d
10. a
11. c
12. b

True or False.

13. T
14. F
15   T or F
16. T
17. F
18. T
19. T
20. T
21. T
22. F
23. T
24. T
25. F
26. T
27. F
28. T or F
29. F
30. T or F

EU-3.

31. Austria's, since GIF tends to compress images row-by-row, and Austria's flag contains the most redundancy per row of pixels.

32. The United Kingdom's, since its rows of pixels alternate colors more often than do Ireland's (and certainly Austria's).

Just the other day... (4 points each.)

33. Lord Dark Helmet does know what he's talking about. It's not very hard to guess such a combination.

34. Dan doesn't know what he's talking about. XHTML is a markup language, not a programming language. You can write webpages in XHTML, not programs.

35. Rei doesn't know what he's talking about. Because they're based on mathematical formulae rather than fixed patterns of dots, vector graphics scale far better than bitmaps.

36. Eugenia doesn't know what she's talking about. Caesar ciphers, which tend to rely on alphabets having very few characters (*e.g.*, 26), are incredibly easy to crack with simple guesswork. RSA, meanwhile, relies on keys with hundreds or thousands of bits; guessing an RSA key could thus take more time than we have on this (non-Google) Earth!

ABCDE-1.

37. None of David's students ever receives an A, B, or C because all students deserving of such grades are instead awarded Ds. Because students deserving As, Bs, or Cs have averages greater than or equal to 70, line 2 of this program always evaluates to true for such students. And so they are awarded a D, as per line 3. Lines 4 through 9 are not even executed for such students.

    The computer considers a 60 to be a failing grade because the program awards Ds to all students having averages greater than 60—not equal to 60—as per line 2.

To redress these issues, the program can be re-written as follows.

```
1.   for each student
2.       if student's average ≥ 90 then
3.           award student a A
4.       else if student's average ≥ 80 then
5.           award student a B
6.       else if student's average ≥ 70 then
7.           award student a C
8.       else if student's average ≥ 60 then
9.           award student an D
10.      else
11.          award student an E
```

This program also correctly recognizes a 90 as an A, an 80 as a B, and a 70 as a C.

Debugging XHTML.

38.

```
<!DOCTYPE html
      PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
      "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html>
  <title>     ← these tags should
    <head>   ← be swapped
      It's the Muppet show!
    </head>   ← these tags should
  </title>      ← be swapped
  <body gbcolor="rouge">   ← attribute should be bgcolor;
                                rouge should be specified with a hex code
    <h1>Here's your host...</h1>

    <br><br>   ← both tags should be closed

    <CENTER>   ← tag should be lowercase
      Kermit the <font color=green>Frog</font>!   ← value should be quoted
    </CENTER>   ← tag should be lowercase
    ← missing </body>
</html>
```
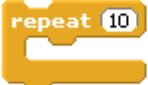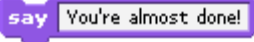
Teasing apart tags.

39. `a`
     `href`
     `http://www.paypal.com/`

40. red
     green
     blue

Puzzled?

41.

statement	play sound meow ▼
loop	forever
Boolean	◇ and ◇
condition	if ◇ else
Boolean	□ < □
loop	repeat 10
condition	if ◇
statement	say You're almost done!

Rapid Fire.

42. A firewall usually examines a packet's source and/or destination port number and only allows the packet to pass if that number is on a list of of allowed ports that sysadmins maintain.

43. Anti-virus software tends to examine files for patterns of bits that belong to known viruses. If such a pattern is detected, its host file is usually quarantined or deleted. On some schedule does the software usually download new "virus definitions" (*i.e.*, patterns of recently discovered viruses).

44. If an audio or video file supports streaming, it can be played before it is downloaded in its entirety (*i.e.*, as it is being downloaded).

45. A variable is a placeholder for some value, be it a number, a sequence of characters, or something else altogether.

46. To compile source code is to translate what is usually high-level, human-readable language into "machine language," patterns of 0s and 1s that a CPU understands.

47. To wipe a hard drive is to fill all of its sectors with 0s, random bits, or some other pattern.

48. Packet sniffing is the act of intercepting (and presumably examining) someone else's network traffic on a wired or wireless connection.

49. Spam often contains apparent gibberish in order to circumvent spam filters, which tend to look for known patterns or keywords. Such spam often contains images as attachments which contain the spammer's actual advertisement or solicitation.

50. Phishing attacks, in the form of emails, often contain misspellings (for no technical reason, mind you) as well as links to sites other than those to which the emails claim to be linking. Such emails tend not to mention the recipient by name (since the phisher only has the recipient's email address), and they often tell the recipient that something's wrong with an online account that he or she doesn't even have!

51. Lossy compression involves decreasing a file's size at the expense of quality (*e.g.*, throwing away frames in order to decrease a video's size).

52. He can't remember!

Extra Credit.

53.

                     PC   Mac

54.   As if!

55.   Almost.