You may take this test with you afterwards, but you must turn in your bubble form answer sheet.

This test is worth 10% of your final grade. Each question is worth 2 points. You must put your answers on the bubble form. This test is closed book and closed notes. For the multiple choice problems, select the best answer for each one and select the appropriate letter on your answer sheet. Be careful - more than one answer may seem to be correct. Some questions are tricky.

**True/False:** On your bubble form fill out A for true and B for false.

T F 1. In the “What is a Computer” exercise, as a class we agreed upon the number of computers in the room as well as a single definition that a computer always has input, processing and output.

T F 2. Search results using different browsers are virtually identical, because a large percentage of the Internet has been indexed.

T F 3. One reliable way to tell if a site contains real vs. fake information is essentially a popularity ranking, measuring the number of other sites that link to it.

T F 4. A compression technique that keeps all original information is called lossless.

T F 5. Think back to the picture drawing activity, where we all drew pictures of a house, the sun, a stick-figure family and a mustang next to the house. The point of this activity was to show that people are creative in different ways.

**The following questions refer to the short story "Light of Other Days".**

T F 6. Mr. Garland and his wife Selina discovered that Hagan’s wife Rose was blind, which is why she was unable to come out of the house to greet them.

T F 7. The slow glass Hagan was selling was 10 years thick.

T F 8. Hagan’s wife and child did not live at his home any more.

T F 9. Mr Garland and his wife Selina are on vacation in the Scottish countryside.

T F 10. Hagan, the scenedow seller invites the Garland's children to play with his children.

T F 11. The interaction with Hagan draws Mr. Garland and Selina closer together.

**Questions from Chapter 8 of the book "Blown to Bits," pp. 278-285**


T F 13. Lamarr and a partner came up frequency-hopping to help control torpedos, and assigned the patent to the US Navy.

T F 14. Lamarr was an outspoken advocate for animal rights.
Questions from Chapter 3 of the book "Blown to Bits," pp. 73-88

T  F  15. When “Track Changes” has been enabled in a Microsoft word document, the modification history can be used to show portions that have been deleted.

T  F  16. The same bit stream can represent an ASCII character or a number.

T  F  17. A pixel is a single point used to represent an image using a grid of picture elements.

T  F  18. Black bars are used in pdf security documents to successfully ensure material is safely hidden.

T  F  19. Document metadata can include who the author was, the date it was created and the file name.

T  F  20. When metadata is present in a file, then by definition the metadata must always be visible.

T  F  21. A time stamp on a file can be reliably used to determine not only when the file was created, but when it was last changed.

Questions from Chapter 4 of the book "Blown to Bits," pp. 120-138

T  F  22. According to one estimate, only about 3% of the Internet has been indexed by Google.

T  F  23. Web pages visited by search engines get cached, which means results of web searches can still be available even when the original underlying page has been removed.

T  F  24. A web search ranks results by relevance, similar to a web popularity contest.

T  F  25. Indexing the web is difficult because a search engine like Google has to periodically index every page in the entire internet.

T  F  26. The Google "PageRank" algorithm ranks a page higher in part when other pages point to it.

Questions from Chapter 2 of the book "Blown to Bits," pp. 36-49; 58-60

T  F  27. Toll transponders have been used in child custody cases.

T  F  28. MIT students were able to re-identify Chicago homicide victims from publicly available data.

T  F  29. AOL search data was used to identify individuals based on their web searches.


T  F  30. While invented long ago, the Caesar Cipher has been used in the last 20 years by the Mafia.

T  F  31. Home wireless encryption protocols have successively been shown to be insecure.

T  F  32. Kerckhoff’s Principle is that you should assume that "the enemy knows the system that is being used."

Questions from Videos listed on the Schedule

T  F  33. A study to analyze passwords was done. To collect password data researches paid subjects candy bars to report actual passwords that they used on other sites.

[From Lorrie Faith Cranor: “What’s wrong with your pa$$w0rd?”]
Multiple Choice (2 points each)

34. Consider the *picture activity* where we compared a word list, a wordle with words being different sizes and orientations, and a picture. What were we able to conclude from this exercise?
   
a) The word list was the most precise, and therefore came first  
b) The picture had the most detail, and therefore came first  
c) The person in the room was male  
d) Our interpretation of data is subject to our own assumptions

35. The point of the *sandwich-making* activity was that
   
a) Our instructions often include assumptions about context  
b) Precise sandwich-making instructions are an example of an *algorithm*  
c) Computer programming involves giving precise instructions, just like in giving instructions to make a sandwich.  
d) All of the above

36. Consider both the *picture activity* and the *sandwich making* activities that we did in class. Which of the following provides the best description of the connection between these two activities?
   
a) Words are ambiguous  
b) Details are important and can affect an outcome of some task  
c) Representation of data makes a task either easier or more complex.  
d) We can interpret language differently because we make assumptions

37. Which of the following is the best example of an *algorithm*?
   
a) Advice on how to have a successful date  
b) A recipe to make a chocolate cake  
c) A list of how to be a successful college student  
d) A rhythm played by one-time U.S. Vice President Al Gore

38. Consider the case where you have a Scratch program with characters that move and talk to each other. You decide to modify the program to have different dialog with different timing. Which of the following will make the most difference in how easy or hard it will be to make this change?
   
a) Whether you used broadcast messages  
b) Whether you used built-in sprites or created your own sprites  
c) Whether the timing of your dialog occurred on regular intervals  
d) Whether many sprites are visible or invisible at a time

39. Which of the following best describes how to always find the best compression using the online text compression tool we used?
   
a) At each step substitute for the pair of most common repeated adjacent letters  
b) At each step substitute for the 2 longest repeated strings  
c) At each step substitute for the most common repeated string of any length  
d) It is not possible to make a hard-and-fast rule that will always give the best text compression.
40. Consider using a 6 x 5 grid of dots to represent the character ‘a’, where each dot is either black or white, as shown at right. This grid is then represented by some numbers. Which of the following is true?
   a) Compression could not be used, since there are so few bits to begin with
   b) Compression could be used, but it would be lossy
   c) Compression could be used, and it could be lossless
   d) We would have to use compression, but could choose between lossy and lossless.

41. Consider how many place values (digits) are needed to represent binary numbers, where the value 0 must also be represented. What is the biggest number that can be represented in binary using 5 fingers, where each finger represents a single binary digit 0 or 1?
   a) 5
   b) 20
   c) 31
   d) 63

42. How many binary digits (bits) would we need to represent all 26 upper-case letters, and all 26 lower-case letters, and the digits 0 through 9?
   a) 5
   b) 6
   c) 64
   d) 128

43. Binary Number 1010 in decimal is:
   a) 5
   b) 6
   c) 10
   d) 20

44. For the following problem remember that when using the ASCII code ‘0’ is represented by 48, ‘A’ is 65, and ‘a’ is 97. If you were a detective analyzing a file and you came across the bit string:
    1 0 0 0 0 1 1
what should you conclude it is?
   a) The number 67
   b) An alphabetic upper-case letter
   c) Part of a picture
   d) It depends on the context in which it is used

45. Adding a zero to the right of a binary number (e.g. left-shifting 110 to 1100) has the following effect:
   a) It doubles the original number
   b) It halves the original number
   c) It doesn't change the original number
   d) None of the above
46. What is decimal 15 in hexadecimal?
   a) 001 101
   b) 1101
   c) A
   d) F

47. What is decimal 16 in hexadecimal?
   a) 001 110
   b) 10000
   c) 10
   d) 16

48. How many binary bit positions are equal to a single hexadecimal digit?
   a) 2
   b) 3
   c) 4
   d) 5

49. Anonymized AOL searches could be used to re-identify a person because:
   a) Eventually their searches include name and address information
   b) Meta-data on the searches reveals the unique location where the search was made from
   c) Unique AOL account numbers were included
   d) A combination of anonymous factors can uniquely identify someone

50. Consider the Ice-Cream Town activity we did in class. What point about strong encryption were we trying to make with this activity?
   a) If you add some extra details, an original message can be successively hidden
   b) Changing the representation of data means a person intercepting it cannot figure out what it means
   c) Encryption makes use of mathematical one-way functions that are easy to create but difficult to solve
   d) Knowing the key for a puzzle allows two people to communicate securely