LBSC 690 Midterm Exam **Fall 2007**

Name: _____

You have 150 minutes to complete this exam. Time will begin as soon as you start reading the first question.

- You may use any material, including the text book, lecture slides, and notes. You may also use anything found on the Internet that existed before the exam started.
- You may NOT communicate with any other person during this exam, either in person or using electronic means.

As strategies for completing the exam, keep the following in mind:

- If you find a question to be ambiguous, make reasonable assumptions as you see fit, but write down your assumptions.
- You are more likely to get partial credit for a wrong answer if you show your work.
- Be careful not to get carried away and run over the time limit by spending too much time on one question. Plan ahead, and don't devote more time to a question than it is worth.

Please write your answers in the space provided.

Score Summary (for use by grader)

Question	Possible points	Actual points
1	15	
2	20	
3	30	
4	20	
5	15	
TOTAL	100	

1. [15 points total] Moore's Law. Give three separate reasons why librarians, archivists, or anyone that works in an information-rich environment should pay attention to Moore's Law. No more than a couple of sentences for each reason. Organize as a bulleted list.

2. [20 points total] HCI. Do you think Washington D.C. Craig's List is a well-designed site? Explain why or why not. See the following URL: http://washingtondc.craigslist.org/

I would like you to answer this question from two perspectives: static design (e.g., site organization) and interaction design (e.g., supporting user navigation). For each, give at least three reasons. In all cases, illustrate with specific design principles and concepts discussed in class. Organize your discussion with succinct bullet points.

NOTE: You do not need to argue exclusively one way or another: in other words, you can say "these aspects represent good design, those aspects represent poor design".

A. [10 points] Static design

- Point #1: I think it's well designed or not well designed because…
- Point #2: I think it's well designed or not well designed because…
- More points…

B. [10 points] Interaction design

- Point #1: I think it's well designed or not well designed because…
- Point #2: I think it's well designed or not well designed because…
- More points…

3. [30 points total] Jimmy's Data Pigeon Service. Since I collaborate a lot with colleagues in computer science, I often need to move data between Hornbake and A.V. Williams (where my colleagues are located).

For all these questions, you can assume that 1MB = 1000KB, 1GB = 1000MB, etc.

Typically, I get a transfer rate of 200 KB/second on FTP between Hornbake and A.V. Williams. The latency of the connection between these two locations is 100ms.

A. [4 points] In total, how long will it take to FTP 100 KB from Hornbake to A.V. Williams?

B. [4 points] In total, how long will it take to FTP 200 KB from Hornbake to A.V. Williams?

C. [4 points] In total, how long will it take to FTP 1 MB from Hornbake to A.V. Williams?

D. [4 points] In total, how long will it take to FTP 1 GB from Hornbake to A.V. Williams?

E. [5 points] Generalize the effect that latency has on total transfer time as the amount of data you are transferring goes up.

F. [5 points] Say I train a pigeon to carry USB thumb drives from Hornbake to A.V. Williams; let's examine how fast data can be transferred using this method. Assume that I am using a USB drive that holds 0.5 GB. Here are the steps:

1. I copy data over to the USB drive. It takes 30 seconds to fill up the entire drive.
2. I attach the USB drive to the pigeon and send the pigeon over to A.V. Williams. This takes 30 seconds.
3. My colleague detaches the USB drive and copies out the data. It takes 30 seconds to copy everything off the drive.
4. My colleague sends the carrier pigeon back to me. This takes 30 seconds.
5. Process repeats.

Given this system for moving data around, how long does it take to move 2 GB over to my colleague in A.V. Williams from Hornbake?

G. [4 points] Compared to FTP, characterize using pigeons to move data around:

Bandwidth:	higher	lower	(select one)
Latency:	higher	lower	(select one)

4. [20 Points total] XML as an enabler. We spent a significant amount of time in class talking about XML as an enabling technology, i.e., XML enables new capabilities that weren't possible before. For example:

- **MathML** allows users to display complex math equations in Web browsers.
- **RSS** allows users to control what they read, through RSS readers that perform aggregation, filtering etc.
- **XML** is used by large companies to manage their supply chains: to lower cost, ensure customers are better served, etc.
- **XML** is used in interlibrary loan to facilitate faster transactions, with lower rates of error.

You may not know this, but Apple iTunes stores metadata about your music collection in XML. Briefly describe 4 new capabilities that this enables. No more than a couple of sentences per capability. Organize as bullet points.

5. [15 points total] Potpourri. True or false?
(If you find a question ambiguous, explain why you think so.)

T F The point of caching is to keep data needed by the processor in faster memory.

T F In a packet-switched network, packets may arrive out of order because the DNS server tells the router to send the packet to different places.

T F From an HTML page on your local computer, it is possible to create a link to an HTML on your live homepage using a relative path.

T F In a network with a star topology, failures of different computers affect the network in the same way.

T F A routing table must have a separate entry for every IP address.

T F One can transform an XHTML page into another XHTML page using XSLT.

T F Since in a typical computer RAM is smaller than the hard drive, processors are optimized to directly access data on the hard drive.