FINAL EXAM

INSTRUCTIONS:

1. This is an open-book, open-notes exam. The source material for the questions is the list of final exam resources available on the class wiki page. You may refer to the web as needed. However, **all answers should be your own. Do not consult anyone else, including your classmates.**
2. You may take as much time as you like. However, it would probably take you no more than 90 minutes.
3. Your answers are due in the form of an electronic document (text, MSWord, or pdf), uploaded to CSNS before the deadline.
4. The deadline for submitting your exam is **5 pm. Sunday June 17, 2012.**
5. Answer to the best of your ability. Where you think necessary, explain the reasoning behind your answer. Some questions require a short writeup (usually no more than 200 words). In all cases, strive for precision, brevity and focus rather than length.
6. The exam carries a total of 100 points. Points for each question are indicated alongside the question.

1. **(2 points)** What was Vannevar Bush’s job title in July 1945?

2. **(4 points)** Which class of professionals was Bush primarily aiming to help with his Memex idea? (Check all that apply)
   a. Researchers
   b. Software engineers
   c. Musicians
   d. Scientists
   e. Identity thieves

3. **(4 points)** (Check all that apply) The vision of Bush’s Memex was that, if implemented, it would
   a. Allow humans to store all important data records in their brains
   b. Allow humans to forget details such as library card numbers that they don’t immediately need
   c. Require humans to spend more time in the library
   d. Result in new kinds of encyclopedias
   e. Make it easier to share results of research
4. **(10 points)** Describe one innovative idea about I/O presented in the “As We May Think” paper (100 words or less).

5. **(10 points)** Referring to Engelbart’s “Augmenting the Human Intellect” proposal document discussed in class, H-LAM/T is the shorthand for the conceptual model of the augmentation of human intellect as envisioned by Engelbart. Explain, in less than 20 words for each, what H, L, A, M and T are, and how they relate to each other.

6. **(10 points)** According to the “neo-Whorfian” hypothesis as stated by Engelbart, the language used by a culture and the people’s capability for effective intellectual action are affected by available technology. In other words, better technology lets us think smarter and act smarter. In less than 200 words, give an example to support or refute this hypothesis.

7. **(2 points)** What is the name of the US government agency that sponsored the research leading to the development of the internet?

8. **(8 points)** Name at least 4 key institutions that performed significant research in the 1960s that contributed to the development of the internet.

9. **(10 points)** List 5 prerequisites for effective man-computer symbiosis as identified by Licklider.

10. **(5 points)** Name one new problem generated by the adoption of Email that required innovative solutions.

11. In his paper “The Computer as a Communication Device”, Licklider says:

    What will on-line interactive communities be like? In most fields they will consist of geographically separated members, some times grouped in small clusters and sometimes working individually. They will be communities not of common location, but of common interest. In each field, the overall community of interest will be large enough to support a comprehensive system of field-oriented programs and data.

    a. **(5 points)** Give an example of a current on-line interactive community.
    b. **(5 points)** Give an example of current technology / product to support “field-oriented programs and data.”

12. In two separate A/B bucket testing experiment for web site design to support both handicapped and non-handicapped users, two designs, one with a new button, having font size 10 (call this design D1) and another design, also with the same new button, but with font size 20 (call this design D2) were compared with the existing design (call it D0) that did not have the button. Here are the results of the two experiments:
Experiment 1: Bucket A is design D0, and Bucket B is Design D1.

<table>
<thead>
<tr>
<th></th>
<th>Sample size</th>
<th>Prefer D0</th>
<th>Prefer D1</th>
<th>Percent Preferring D1</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Users</td>
<td>6006</td>
<td>96</td>
<td>5010</td>
<td>84.44%</td>
</tr>
<tr>
<td>Handicapped</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>83.33%</td>
</tr>
<tr>
<td>Non-Handicapped</td>
<td>6000</td>
<td>95</td>
<td>5005</td>
<td>83.41%</td>
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</tbody>
</table>

Experiment 2: Bucket A is design D0, and Bucket B is Design D2.

<table>
<thead>
<tr>
<th></th>
<th>Sample size</th>
<th>Prefer D0</th>
<th>Prefer D2</th>
<th>Percent Preferring D2</th>
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<tbody>
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<td>1605</td>
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<td>84.01%</td>
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<tr>
<td>Handicapped</td>
<td>100</td>
<td>15</td>
<td>85</td>
<td>83%</td>
</tr>
<tr>
<td>Non-Handicapped</td>
<td>10000</td>
<td>1600</td>
<td>8400</td>
<td>84.16%</td>
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</tbody>
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As you can see, both D1 and D2 win handily over D0, and D1 has an overall score slightly better than D2, though D2 scores higher with both handicapped and non-handicapped users.

a. **(2 points)** What is this seemingly strange result called?

b. **(10 points)** Would you select D1 or D2 as the design for your product? State your choice and explain why in less than 200 words.

13. Use Fitts's Law to answer the following:

a. **(6 points)** Explain, in less than 200 words, why it was a good idea for Apple to locate the Mac's application dock at the bottom of the screen, and for Microsoft Windows to locate its Start menu button at the bottom left hand corner of the screen.

b. **(7 points)** Mac places its Application Menu at the top of the screen, while Windows binds the Application Menu to the window of the application itself. Which design is better from the usability point of view, and why? (200 words or less)