Overview
As promised, here is a midterm review sheet. In general, you should be familiar with the content from the readings as well as that covered by the lectures. Note: I updated this review sheet to include content from Monday’s lecture (Lecture 14).

Readings
- Vannevar Bush, As We May Think, The Atlantic, July, 1945. [link]
- Tom Kelley, “The Perfect Brainstorm” from Chapter 4 of The Art of Innovation [link]
- Jeanette Blomberg and Mark Burrell, “An Ethnographic Approach to Design” [link]
- IDEO Method Cards [link]
- Pages 9 - 28 in Don Norman’s “The Design of Everyday Things” covering affordances, visibility, mappings, and feedback [link]

Lecture Concepts
The full sixteen week semester is largely broken down into five parts:

1. Overview of design and the design process
2. User Research I: Techniques to understand users to inform design
3. Building the interface (e.g., design principles, user perception and cognition)
4. User Research II: Techniques to evaluate a design
5. Fun HCI stuff that I think is worth talking about (i.e., persuasive design, HCI history, state-of-the-art systems)

We have only covered parts 1, 2 and a portion of 3; thus the midterm will focus on those aspects. The following subsections highlight the main points from lecture that I think are most important. I do not guarantee that this list is comprehensive but knowing the following material combined with a strong grasp of the readings above should lead to a good score on the midterm. There will be no significant surprises on the exam; it will have a similar flavor to what we do in class. Know the material and you will do well.

High-Level HCI Concepts
• Be able to define HCI, its goals as a discipline and the fields that it heavily draws upon (Lecture 1)
• How does Moore’s Law relate to human abilities? How can HCI leverage Moore’s law? (Lecture 1)

Ideation and Brainstorming
• Be able to describe the hill climbing/simulated annealing metaphors used in class to describe the importance of brainstorming and iterative design (Lecture 3)
• Be able to describe Duncker's (1945) "Candle Problem" experiment and the idea of functional fixedness. You don’t have to read the paper, just be familiar with the concept (link). The Wikipedia article is actually pretty good (link). (Lecture 3)
• Be able to describe Adamson’s (1952) follow-up experiment and the idea of preutilization. You don’t have to read the paper, just be familiar with the concept (link); see also Wikipedia link from above. (Lecture 3)
• Similar to what we did in class as a group on the whiteboard, be able to describe how IDEO nurtures a creative workplace
• Know the tenets of brainstorming (e.g., the Linus Pauling quote). You should pay special attention to rules #1, #2, #3 and #5 of the IDEO Brainstorming Rules (Lecture 3).

Design and Design Process
• Draw and understand design cycle diagrams (Lecture 1 and 2)
• What is iterative design? (Lecture 2)
• Be able to draw and understand the formative -> build -> evaluative cycle. (Lecture 6)
• What is the elaboration and reduction cycle in the design process? (Lecture 4)
• What is Greenberg’s 10Plus 10Method? How does this relate to the team project assignment #2? (Lecture 4)
• What are Norman’s principles of design? (Lecture 10 and 12)
• Understand and be able to describe: visibility, affordance, feedback, mapping, constraint, and consistency. (Lecture 10 and 12)
• Understand and be able to describe the four types of constraints (Lecture 13)
• Be prepared to do something similar to the design activity in Lecture 4 on the midterm.

User Research
• What is contextual inquiry? (Lecture 6 and 11; see also readings).
• What is the formative part of the design process? What is the evaluative part? (Lecture 6)
• Understand and be able to describe ethnography, interviews, surveys, diary studies, interaction logging and their various tradeoffs (e.g., in terms of macro vs. micro, statistical vs. interpretive) (Lecture 6)
• Be able to argue convincingly why we can’t just rely on a user’s words during the design process (Lecture 6)
• Similarly, be able to point out what users can tell you that few other techniques capture (Lecture 6)
• What is ethnographic-based design and what are four ethnographic principles? (Lecture 6)
• What is task analysis? (Lecture 11)
• What are some task analysis questions? (Lecture 11)
• How is task analysis useful to design? (Lecture 11)

Sketching & Prototyping
• Why sketch? (Lecture 4)
• Is drawing ability fundamental to sketching? (Lecture 4)
• What are some sketching techniques that we covered in lecture such as “manual photocopy,” “use of annotations,” “photographic composition”? Why is this important to sketching? (Lecture 4)
• What are some different levels of sketching fidelity? Why start on paper? (Lecture 4)
• What techniques can we use to sketch behaviors (i.e., image sequences, state transition diagrams, storyboards)? (Lecture 4)
• Be familiar with the Bayles and Orland “Ceramic Design Experiment” (Lecture 1)
• Know the differences between lo-fidelity and hi-fidelity prototyping including visual fidelity, functional fidelity and content fidelity. (Lecture 8)
• What are some of the benefits of evaluating paper prototypes rather than more refined versions of the interface (Lecture 4 and 8)
• Know the process that Larry Tesler and Bill Atkinson used to build the Apple Lisa UI (Lecture 8)

Mental Models
• What are mental models? What can contribute to a user’s mental model of a system? (Lecture 10)
• Be familiar with Susan Carey’s definition of a mental model. (Lecture 10)
• Be prepared to discuss an example from your own life when you (or a friend/family member) had generated an improper mental model of a system. See examples from Lecture 12.
• Be able to draw and describe Norman’s Designer -> System -> User conceptual model diagram (Lecture 10 and 12)
• How does a designer communicate with a user? (Lecture 10 and 12)
• What are affordances, constraints, mappings? (Lecture 10, 12 and 13)
• Can affordances affect behavior? (Lecture 10)
• How are affordances used in interfaces? (Lecture 10 and 12)

Representation
• What is semiotics? (Lecture 13 and 14)
• How can representation affect perception and cognition? (Lecture 13 and 14)
• Why do so many interfaces rely on metaphors? (Lecture 13 and 14)

Perception and Information Processing
• What does information processing consume? (Lecture 14)
• What is the difference between recall and recognition? (Lecture 14)
• What are the two photoreceptors of the human eye and what do they do? (Lecture 14)
• Do we have uniform or non-uniform visual processing power across our eye? (Lecture 14)
• What is a saccade? What does it do? (Lecture 14)
• What is preattentive processing? (Lecture 14)
• What can be considered preattentive? (Lecture 14)
• What are some preattentive (static) visual features?

Other
• What is the goal of the project this semester? (Lecture 2)
• What “IDEO Method Card” techniques did the IDEO employees use in their (re)design of the shopping cart?
• Why do we have speedometers and vehicle activated speed signs? (Lecture 13)
• Why has the Toyota Prius dashboard display been effective in allowing drivers to increase the efficiency of their driving behaviors? (Lecture 13)