Midterm Exam Sample Solutions

1 Multiple Choice

Each question has FOUR possible answers. Circle the letter of the best answer for each question.

[1]

1. Which of the following fields is not an influence on HCI?

   (a) ergonomics

   (b) cognitive psychology

   (c) computer science

   (d) all of the above *are* an influence on HCI

   ⇒ (d) all of these fields influence HCI

[1]

2. Scripting (the ability to record and play back programmable sequences of actions) is an example of:

   (a) speaking the user's language

   (b) allowing the user model to grow

   (c) the "recognition rather than recall" principle

   (d) a mode in the user interface design

   ⇒ (b) allowing the user model to grow; in this case it allows the user to create their own higher-level actions

[1]

3. An icon of a file folder, which users can drop files on in order to move them into the folder, is an example of which of the following:

   (a) the "recognition rather than recall" principle

   (b) direct manipulation

   (c) a metaphor

   (d) all of the above

   ⇒ (d) all of the above

[1]

4. You drag a folder to make a copy of its contents. An animation appears on the screen, showing files moving from one folder to another. This is an example of which of the following:

   (a) visibility

(b) mapping

(c) an affordance

(d) feedback

⇒ (d) (see Week 1 lectures)

5. Your new sound card is packaged in a plastic anti-static bag. The bag is sealed with a yellow sticker with a written warning not to expose the card to static electricity. The sticker is an example of:

[1]

(a) perceptual constraint

(b) cultural constraint

(c) physical constraint

(d) logical constraint

⇒ there are two possible answers: (b) (the colour yellow is used to indicate a warning); or (c) (the sticker prevents you from opening the package until you see the label)

6. Which of the following statements is *false*?

[1]

(a) Norman's logical constraints are one way to implement Nielsen's principle of error prevention.

(b) The help and documentation called for by Nielsen's usability principle form part of Norman's definition of the system image.

(c) Norman's principle of feedback is one way to implement Nielsen's principle of "recognition rather than recall."

(d) All of the above statements are *true*.

⇒ (c) feedback happens after an action is performed; recognition helps the user discover/select appropriate actions

7. Which of the following statements is *true*?

[1]

(a) Violating Norman's feedback principle interferes with the fourth stage of Norman's Seven Stages of Action.

(b) There is no ethical way to collect data about people without their informed consent.

(c) Structured interviews are less likely to miss salient details than unstructured ones.

(d) All of the above statements are *false*.

⇒ (d) all of these contradict statements or examples given in class and/or the lecture notes

[1] 8. Which of the following gestures makes use of a quasi-mode?

(a) Selecting one of the commands (draw, spray paint, etc.) in the tool palette of a paint program.

(b) Using the Ctrl-V shortcut to paste text.

(c) Clicking a link in a web browser.

(d) All of the above make use of quasi-modes.

⇒ (b) Ctrl modifies the meaning of the V key only as long as it is held

[1] 9. Unlike traditional observation, guided observation:

(a) sets strict guidelines for session activities

(b) reduces error introduced by the experimenter

(c) sets strict guidelines for session lengths

(d) includes some interaction with participants

⇒ (d) (defined in lecture notes)

10. The *Num Lock* key found on many keyboards, which enables the user to use the number functions of the numeric keypad rather than the cursor
[1] control functions, indicates which of the following *features* is present:

(a) a mode

(b) a quasi-mode

(c) a physical constraint

(d) a logical constraint

⇒ (a) since it sets the state used to interpret numeric keypad gestures

11. As we have used the terms in this course, what is the relationship between
[1] *tasks, actions,* and *goals*?

(a) a task is composed of goals and actions to accomplish those goals

(b) an action reifies a task into a goal

(c) a goal is composed of a set of actions that accomplish a task

(d) none of the above

⇒ the intended answer is (d), but (c) is somewhat ambiguous and will also be accepted—goals are abstract objectives; tasks are objectives that must be fulfilled to achieve a goal; actions are specific concrete gestures required to achieve a task.

12. The *Num Lock* key found on many keyboards, which enables the user to use the number functions of the numeric keypad rather than the cursor **[1]** control functions, indicates which of the following *features* is present:

    (a) a mode

    (b) a quasi-mode

    (c) a physical constraint

    (d) a logical constraint

    ⇒ the answer is still (a)

2 Short Answer

For each question, fill in the provided blanks with your answer.

1. List two problems that user interface design has in common with tradi- **[2]** tional software engineering:

   ⇒ These three were given in class: requirements are a moving target; users often do not understand their own requirements; the design possibilities change with the technology.

2. How does user interface design fit within the broader field of human com- **[1]** puter interaction (HCI)?

   ⇒ User interface design is the application of HCI to real systems.

3. Consider the following statement: *In order to improve an interface design, it is necessary to consult with the primary users of the system.* Is this **[1]** statement true or false? Explain your answer.

   ⇒ False. Once can often improve a design simply by applying design principles. However, the best designs do take the user into account, and direct communication is an effective way to learn about their particular characteristics.

4. Give an example of how modern web browsers do (or could) anticipate the **[1]** user's needs.

⇒ Here are two ways: completing the address bar with recently visited sites as the user types, and downloading the links from the current page before they are actually requested.

5. Name something that you could say or ask while interviewing someone in their home to help establish rapport. **[1]**

   ⇒ You might ask them about a picture or other keepsake displayed in their home. Any reasonable answer is acceptable here.

6. Explain why the following statement is false: *Unlike the user model, the design model is complete and accurate.* **[1]**

   ⇒ Although the designer normally has a better understanding of the system than that inferable from the system image, software systems are so complex that he or she will almost certainly not have *perfect* knowledge of the system.

7. List two of Norman's interaction design principles that are often violated by command line interfaces in practice (such as a Unix shell). For each explain how it is violated. **[2]**

   ⇒ Some possible answers:
   feedback (many commands do not display anything unless there is an error; the user doesn't know if the command succeeded or silently failed due to a bug)
   consistency (often the same option letter means different things for different commands)
   visibility (the list of accepted commands is not shown)

8. Name and define two properties of an effective metaphor: **[2]**

   ⇒ They must be *meaningful* (user must be familiar with them and be able to recognize them) and they must *match the user's expectations* (behave the way the metaphor would be expected to behave).

3 Design Problems

Use the space provided to create the design process artifact required by each question.

1. An elevator panel will require buttons for four floors (parking, main floor, second and third floor), door open, door close, stop, and activate emergency intercom. Propose a design for these buttons. Draw them in a single row in the space below. Use the psychological principles (gestalt laws) of *similarity* and *proximity* to help the user map intentions to actions. **[3]**

If you wish, you *may* provide a brief *design rationale* for your solution:

⇒ *Similarity:* buttons with the same shape and colour perform similar functions. *Proximity:* buttons with a similar function are closer together than buttons with dissimilar functions so that they form visual groups; the door control buttons are closer to the stop button than the floor selection buttons because they form a subgroup of secondary controls.

2. You are designing a web site to allow online rental of DVDs and audio-books. Create a table of relevant user qualities (characteristics) and the design requirements they imply. **Note:** the number of marks is not related to the number of table entries expected. **[4]**

⇒ *Some possible entries:*

Characteristic	**Expected Values**	**Requirement**
Age	16+	restrict access to movies by age range
Knowledge	Casual–Movie Buff	provide a variety of ways to classify movies; e.g., causal: based on movies the user has already seen/buff: by director
Culture (Language)	Mostly English, but varies	user needs to know subtitles/language tracks available

3. Write an *essential use case* for the task of *renting a new item* from the above online company. Assume that the user is already a member and that they pay a flat monthly fee for rentals (that is, payment is not part of the task). **[4]**

⇒ An essential use case is an abstract description of a task that is independent of *how* it is carried out. (For example, it does not include specific techniques or UI components.)

An answer might look something like this:

Rent a New Item

User's Purpose	**System Responsibility**
Identify account	Validate that account is correct
Browse/Search for desired item(s)	Display matching results
Select desired item(s)	Display selected item(s)
Verify the selection	Update items rented by user/available to rent
	Request shipment of item to user

This is how the text book presents essential use cases. The lecture notes present a point-form list that simply states what happens at each step. Either format is acceptable here.

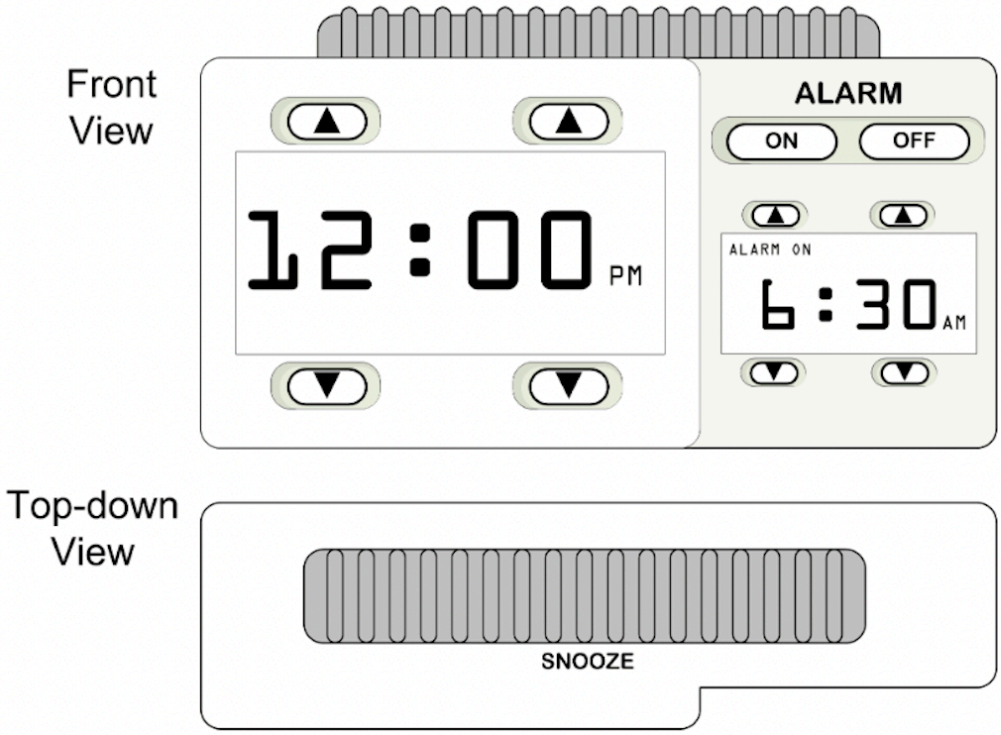
4. In the space provided, write a *scenario* based on the essential use case you created in the the previous question (you will have to first imagine a concrete use case): **[4]**

   ⇒ Scenarios provide concrete illustrations of a task based on an actual (usually fictional) user.

   A possible answer based on the above essential use case might be:

   Sarah is a store manager at a high-volume discount store who likes to watch movies on the weekend to help her relax. It is Monday, and she wants to rent a movie before she heads to work to ensure it arrives in the mail before this weekend. Going to the main page for the rental site, she clicks on the "Members" button and then enters her user credentials. A welcome page verifies that she entered her credentials correctly and tells her she currently has 2 items rented and can rent up to 2 more. It also lists some popular movies that are currently available. Since she is a casual user, she does not have a list of movie titles in mind. As she is in a hurry, she decides to let the system recommend something to her. She clicks on the Romantic Comedy category, which displays a list of the most popular movies of that type currently available. She then clicks on the Recommend button, and a list of romantic comedies (with box art, title, rating, one-line plot summaries, year, and language(s)) rented by other users who also rented movies she previously rented is listed. She browses the list, and chooses a title that catches her attention. A page with additional details (larger picture, list of principle actors, the director, more plot details, and user reviews) appears. She sees that the film stars one of her favourite actors, and on scanning the first user review sees that it is very positive. Deciding to rent the DVD based on this information, she clicks the Rent button, then verifies her selection on the following verification page. Noting the time, she hurriedly turns off the display, grabs her coffee, and heads off to work.

5. In the space below, sketch an interface design for an alarm clock. You must be able to set the current time, set the alarm time, turn the alarm on or off, and snooze (temporarily turn an active alarm off to rest a few more minutes). **There are no other functions or features.** **[8]**



6. In point form, explain the four most important or interesting features of your design. For each feature, list a design principle (or user need), then explain how the feature implements the principle. **[4]**

   ⇒ Some of the features of this design:

   Mapping: Arrow directions and locations indicate clearly what effect the time and alarm time setting buttons will produce.

   Safety/error prevention: Recessed time set buttons help prevent accidental setting changes.

   Know the user: A large, overhead snooze button can be easily found and pressed by a drowsy user without opening their eyes; at the same time, the alarm off button is hard to press, reducing the likelihood of turning the alarm off and then falling back asleep.

   Modeless: Every control maps to exactly one action (note in particular that the alarm on/off actions are controlled by two separate buttons).