Name: _____   **Student ID Number:** _____

Signature: _____

CPSC 344 2005-06 Term 1 Midterm Exam
50 minutes

SOLUTIONS + comments

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Exam Instructions (read carefully):

1. **Immediately** sign the first page of the exam with your **signature** in the space provided on the upper left.

2. Print your **Name** and **Student ID** at the top of each page in the booklet **before you start working.**

3. Continue reading these instructions, but **do not open the exam booklet** until you are told to do so by a proctor.

4. **Cheating is an academic offense.** Your signature on the exam indicates that you **understand** and **agree to** the University's policies regarding cheating on exams.

5. The exam is **closed book**. There are **no aids permitted** (this includes calculators).

6. **Interpret the exam questions as written**. When in doubt, take a strict, literal interpretation of the question.

7. You have **50 minutes** in which to work (~1 min/mark). **Budget your time wisely**.

8. No one will be permitted to leave the exam room during the **last ten minutes** of the exam.

Question	Points	Received
1	9	
2	8	
3	9	
4	12	
5	12	
Total	**50**	

Question #1 [9 points total]: Matching Exercise

The terms listed immediately below are possible answers for the definitions listed lower on the page. Use the number corresponding to a term below as an answer in the space provided next to the following questions if you think it is the *best* match for that concept or definition. Each term is used either once or not at all.

(1) Focus group

(2) Stakeholder constraint

(3) Design model

(4) Origami

(5) Heuristic evaluation

(6) Cast of characters

(7) Ethnography

(8) Unstructured interview

(9) Task example

(10) Participatory design

(11) Gulf of evaluation

(12) Popcorn

(13) Runnable model

(14) Cognitive walkthrough

(15) Technology constraint

(16) The myth of human error

(17) Psychopathology

(18) Situation of concern

(19) Iterative design

(20) Hidden video recording

(21) Causal relation

(22) Transfer effect

(23) Paper prototype

(24) Active listening

For each statement below, write the number of the term from the list above that **best** fits into the missing space. [1 pt each]

_8_ (a) Example of an 'intrusive' tool for observing a single user (in sense of user's immediate perception)

_23_ (b) Illustrates the logical flow of an interface design

_7_ (c) The general practice of observing users and tasks in their own context

_6_ (d) A method in which designers "identify with" the user

_15_ (e) One example is when a company owns intellectual property relating to the product being designed

_22_ (f) The designer can exploit this to promote an accessible mental model for an interface

_1_ (g) Evaluation technique especially suited for identifying 'proto-users'

_11_ (h) An impediment to transparent goal-oriented action

_12_ (i) A metaphor that describes a particular concept generation technique

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Question #2 [8 points total]: True/False

For each of the 4 statements below, indicate whether the statement is true or false by **circling** either **True** or **False**. Briefly explain your answer in one or two sentences. [1 pt / correct answer, 1 pt/explanation]

(a) Statement: Discount methods are a means of 'simulating' user feedback, and as such may have a lower cost.

(True)   **False**

Explain:

> *True. They're 'discount' because they're cheap. Ideally, direct user feedback would be required; but this is not always possible. Also, the analytical qualities of the discount methods are useful in their own right.*

(b) Statement: The CS344/444/543/544 ethics protocol submitted to the Behavioral Research Ethics Board at UBC allows 344 students to request participation from anyone who is clearly a stakeholder of the system being evaluated in the students' course project.

True   **(False)**

Explain:

> *False. 444/544 students may only recruit their friends, family members, classmates and acquaintances through word of mouth.*

(c) Statement: Slips are errors that are made because the user has the incorrect mental model.

True   **(False)**

Explain:

> *False. Slips are unconscious errors. Mistakes are errors of intention that could be caused by an incorrect mental model.*

(d) Statement: Questionnaires usually have a lowest cost of actual administration and analysis (per-study) of any evaluation technique.

(True)   **False**

Explain:

> *True. The cost of administering and analyzing a questionnaire is pretty low (especially with online methods); and it is relatively easy to automate. On the other hand, designing a questionnaire well can be time-consuming, and collecting contact data (e.g. email addresses or mail addresses) may be problematic or expensive. Respondence rates can be low.*

Question #3 [9 points total]: Discussion Questions

generally very well done

(a) Describe how task examples relate to a design prototype. [3 pts]

Task examples explain what a user does or wants to do, but not how s/he does it. They can be used to test a design prototype (e.g. by driving a heuristic evaluation) but they themselves are design-independent.

(b) Describe "stimulus fusion", and explain its relation to perceptual causality. [3 pts]

Stimuli which occur in the same 'perceptual processing cycle' can fuse and appear to belong to the same percept. If stimuli appear to cause one another, they can also fuse without having to occur at the same time.

(c) Compare and contrast ethnography and observation. [3 pts]

Observation = a broad class of observation techniques.

Ethnography = a specific but sophisticated type of observation, usually extending over a period of time and with the objective of building up a body of general knowledge about a user group.

Questions 4-5 are based on the following design brief.

"*DigiCookbook*": a Cook's Assistant for the Electronic Kitchen

Digital Kitchens Inc. has finished most of the development of a product called *DigiCookbook*, a recipe management application that lets users:

- enter or download recipes
- search on topics such as cuisine or ingredient
- compile weekly menus
- create grocery shopping lists.

It will operate on a desktop PC; in a networked home, it will also be usable in the kitchen with simplified I/O devices, replacing a paper recipe book. *DigiCookbook* will use two sources of recipe data: a locally stored and cross-indexed database of downloaded or manually entered recipes, both capable of being annotated; and/or a large online database of recipes, available at www.digiCookbook.com.

DigiCookbook is targeted at tech-savvy families with children living in the home.

You've been assigned by your employer (a UI design consulting firm) to help *DigiCookbook's* production team to refine certain aspects of their upcoming product release.

At present, *DigiCookbook* exists as (a) a functioning but aesthetically unexciting engineering prototype that simulates access to local and online recipe databases, and (b) a series of non-functioning conceptual mockups that indicate how the graphical user interface might look. The latter takes the approach of two use modes of the interface, with graded complexity:

(1) *desk*: for I/O intensive tasks such as data entry, search, menu management, etc; user sits at a computer and uses a keyboard and mouse

(2) *kitchen:* for simple recipe display in the kitchen while cooking; assumes 'thin client' connection to the desk computer, with a low-res touch screen but no separate keyboard or storage. Individual recipes, or small sets of them, can be 'sent' to the *kitchen* display from the *desk* terminal.

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Question #4 [12 points total]: Interaction Models

(a) Which of these mental model types do you think a user would find most useful in the use of the 'kitchen' mode for *DigiCookbook* – and a designer should therefore choose to reinforce? **Circle one**, **justify** your response in 1-2 sentences, and **give one example** of a design element that would reinforce the type of model you've chosen. [5 pts] – *one pt for free (circling one of the choices)*

state-transition model   object-action model   mapping model   metaphorical model

Justify:

There is more than one reasonable approach to designing this interaction, so the key to this question is in your justification. For example,

*- An **object action model is probably the most obvious**, since the primary goal of the interaction is to effect changes on specific data objects (individual recipes, the recipe database, menus, grocery lists, etc).*

*- A **metaphorical model** may be a popular choice, since the metaphor of a traditional recipe book or file might drive the design. It will almost certainly run into limits which might make it less useful, though, since this system supposedly will do much more.*

Example of a design element that reinforces the model in a useful way:

Object-action model: visually representing the objects which the user can't see is a good way to reinforce this model. The representation must be in a useful way to get full credit.

(b) Identify one challenge the UI designer will face in creating a good mental model for this product (more than one good answer exists). [3 pts]

Many possibilities. 2 examples:

1. Exhibiting the functionality available in limited kitchen *mode*

2. Organization of data (e.g. what can be searched on).

3. Making the kitchen *display update step transparent, when the user making the update from the* desk *terminal cannot see the* kitchen *display for confirmation of correct actions*

Points varied based on quality of answer and how well it related to the mental model.

(c) Identify two reasons why users might prefer the 'old-fashioned' system consisting of a mess of bound cookbooks and paper recipe cards, over this new electronic approach. [4 pts]

Many possibilities. Credit for all good ones, e.g.:

1. Physical annotation properties of archival paper

2. Data entry is a pain

3. Paper is easier to read than a monitor, and perhaps more kitchen-friendly; wasteful to print out recipes each time used

> *4. Many recipe books are beautiful and/or embody emotional attachments*
>
> *Points varied based on quality of answer and how well it related to the mental model.*

Question #5 [12 points total]: Involving Users

You need to get a general idea of the problems with the current design for *DigiCookbook*, and to understand the basic constraints on the next iteration. Who should you talk to?

In the box below, **list four primary stakeholders** who might have distinct needs, concerns and influence in this design process, taking care to identify their key attributes and abilities. The terms "family member" or "the company that manufactures the product" are too general.

Then, for each stakeholder group identified, **list one activity** that you could do as the designer, which would help you better understand how to proceed with your task. Choose the activity appropriately for the particular stakeholder and keep in mind the current prototyping status of *DigiCookbook*. The terms "observation" or "interview" are too general as answers; you must also include some sense of what you hope to gain. Do not list the same activity under more than one stakeholder (i.e. list 4 different activities).

Finally, clearly **justify the choice of activity** for that stakeholder.

There is more than one acceptable answer for this question.

Credit given for all reasonable answers: 4 pts / stakeholder (16 pts total), 2 pt for each well-defined, appropriate stakeholder and 2 pts for each plausibly justified activity. Examples of possible answers are listed below. Points were subtracted for answers that were unhelpfully vague (e.g. "family members": there are many possible types of family members, with different roles to play in this product and different abilities / motivations for making it function smoothly.)

Stakeholder	Activity	Justification
(a) technically sophisticated family members who participate in the family cooking and/or menu planning	*Think-aloud observation while using engineering prototype*	*This group is probably best suited as a source of specific usability feedback, and should be able to 'see past' an 'ugly' engineering prototype*
(b) technically unsophisticated family members who cook	*Paper (not online) questionnaires* *Focus group, combined with demo of medium-fidelity conceptual prototypes*	*Don't show them the engineering prototype, since they might find it overwhelming or difficult to comprehend.* *Since not familiar w/ technology, the peer-reinforced atmosphere of a focus group might be reassuring and generate more imaginative responses. They probably will need some aid to understand system.* *Questionnaires might be good way to get at willingness-to-pay, etc.*
(c) system engineers	*Semi-structured interview*	*Ask about constraints on system design. Structured part: opinions on changes you're envisioning suggesting.* *Unstructured part: 'What else should I*

		know about'?
(d) company's VP of marketing	*Unstructured interview*	*'Tell me about the demographic you're targeting for this product."*

Extra page to continue work.