Final Exam (20% of Course Total) MOCK EXAM

Due date: 10 Aug, 11:59p

This is a mock final exam for CMPT 363. Its objective is to show you how the exam questions will look like. In the real exam there will be more questions and more in-depth but the format will be very similar. To help you better study, some suggested answers are also provided for each question.

Read the entire document carefully.

Description

Here are some information about this final exam:

- This exam is open books/slides, open internet
  - This does not mean you can copy & paste from your reference. You must first understand it, then type everything with your own hands. You must also cite where your reference is.
- All work must be done by yourself (we might interview you if we find anything suspicious), i.e., you cannot ask or pay someone to write the answer for you, in part or total.
- It is an individual exam. You must not share the questions and/or answers with anyone else.
  - Conferring with anyone or distributing the exam materials will be considered cheating.
- If there is any topic/concept that is in conflict between class slides and other materials, what is taught in the classes will be used, unless the question specifically refers to a different material.

There are 4 questions in this exam. For each question, write your answer as required. Your answers will be evaluated based on relevance, comprehensiveness, conciseness, and clarity. Each answer should not be more than 1 page.

There is no particular ordering of the questions (i.e., last question does not necessarily mean it is the hardest or easiest). Do what you can and if you are stuck try another question and come back to it later. When in doubt, write down your assumption. Only questions regarding technical issues or typos will be considered (email the instructor if so and keep an eye on the Announcement on Canvas for updates).

Question 1 [10 marks]

Suppose you are working for a company that develops software products for vehicle infotainment systems. You are tasked with "creating a prototype for the user interface" of a new type of vehicle. Would you choose to create a low-fidelity prototype or a high-fidelity prototype?

First describe two considerations when choosing the level of fidelity, then provide two reasons why you choose one over the other. Finally, discuss how you are going to create that prototype and evaluate it.

Suggested answers:

2 Considerations:

The first consideration is which stage of development the use interface is at, for example, to brainstorm different ideas or to test a close-to-finish design (e.g., an A/B test). The second consideration is how much time do you have. LFPs tend to take less time to create and HPFs takes much longer.

(Or anything that makes sense and highlights the difference between LFP and HFP and affects the decision)

2 Reasons of choosing one over the other:

Option 1: LFP over HPF

The new interface designs and brainstorming new ideas are needed, LFP allows creation of variations. There isn't much time to create a close-to-finish design and you need something to gather feedback

(Or anything that makes sense (refer to L03-02 p20 Advantages of LFPs and Disadvantages of HFPs)

Option 2: HPF over LFP

You want to give evaluators a more polished and automated experience with the prototype and thus elicit useful feedback. You want to be able to do a field test which require something functional.

(Or anything that makes sense (refer to L03-02 p20 Disadvantages of LFPs and Advantages of HFPs)

Creating the prototype (must match with the prototype level)

LFP: use different simple materials such as paper or prototyping software to quickly create prototypes. Interactivity is achieved by either Wizard of Oz (having a human operator behind the scene taking the role of the interactive system) or the software creating them (e.g., Balsamiq)

HFP: create a functioning prototype and install that into the new type of vehicle so that it behaves as if it is close to a complete version.

Evaluating the prototype (must match with the prototype level)

LFP: controlled study with the facilitator mimicking the interactivity (e.g., via wizard of Oz), during which user feedback can be collected via video/audio recording, think-aloud protocol, and questionnaires.

HFP: controlled, field, or in-the-wild study where evaluators use the prototype in a close to natural setting, during which user feedback can be collected via video/audio recording, think-aloud protocol, journaling (probing), and questionnaires.

Question 2 [8 marks]

Consider the following water kettle with temperature control:

About this item:

- Capacity: 1.8L / 60oz
- Electronic temperature control with presets
- 5 different colours according to selected temperature
- 360 degree cordless kettle
- Boil-dry protection
- Keep warm function

Source: https://www.amazon.ca/Kalorik-JK-42656-BK-Kettle/dp/B01IDRTS86 (ignore the reviews)

Evaluate this kettle design and functionalities by discussing how any two of the Nielson's Heuristics are demonstrated.

Using Norman's Action Cycle, describe the six stages to heat water up for coffee using this kettle. For each stage, explain how the kettle's design and functionality supports the action.

Suggested answers:

2 Nielsen's Heuristics

-Visibility of system status: kettle has a clear body to show water is boiling and uses different colours to indicate different temperatures

-Error prevention: kettle has boil-dry protection to prevent hazardous situation where there is no water in and the kettle is turned on

-Recognition rather than recall: kettle body has markers showing volume as well as min/max levels

(Or anything that makes sense and clearly explained)

Norman's Action Cycle

Plan: intention to make coffee and consider how much water is needed and which temperature preset offered by the kettle to use (e.g., 90C)

Specify: think of sequence of actions, including putting enough water in and setting the temperature by pressing the right button

Perform: pour enough water into the kettle, set the temperature, turn the kettle on by pressing the on button

Perceive: observe the water being boiled to the desired temperature, as indicated by the boiling of the water through the clear kettle body and LED colour

Interpret: make sense of the observation by knowing that the water is boiling and has reached to a temperature as indicated by an LED colour

Compare: compare the LED colour to the expected colour and verify that the water is at the desired temperature for making coffee

Question 3 [8 marks]

As discussed in the lectures, the 10 Nielsen's Heuristics have different priorities based on what is being designed and for whom. Provide two sets of context and user in which one heuristic should be prioritized over another one and explain. Your answer should be something like: Heuristic A should be prioritized over heuristic B in the context of C with users U, because XYZ. These two sets cannot have any overlap.

Direction Manipulation (DM) is a mechanism letting users to feel that they are directly affecting the system through their actions. Describe four Nielsen's Heuristics that can be facilitated by DM. For each heuristic, provide an example.

Suggested answers:

2 Sets of context and user (need to explain why one is important and the other is not)

Flexibility & Efficient of Use should be prioritized over Help & Documentation in the context of a graphics design software with expert users, because they can and need to do things more efficiently and do not need a lot of assistance in using the software

Error prevention should be prioritized over Aesthetic & Minimalist Design in the context of software that supports critical decision-making such as air traffic controls with air traffic controllers, because errors have dire consequences and "looking nice" or "simplicity" are not critical to good decision making.

(Or anything other combinations that make sense)

4 Nielson's Heuristics that can be facilitated by DM

- Visibility of system status: representative virtual objects are persistently shown on the screen for users to be aware of system status at all times (e.g., a lock icon indicating information is being secured or encrypted)

-Match between system & the real world: actions matches with real-world metaphors (e.g., moving a file to trash bin)

-Recognition rather than recall: Virtual representations of objects closely resemble their nature (e.g., a document icon represents a file in the system)

-Consistency & standards: actions that are similar in nature mean similar things (e.g., dragging a file icon means moving the file in all cases)

(Or anything that makes sense (refer to L07-02 p 11 for principles of DM))

Question 4 [4 marks]

During the guest lecture in L11 Laton introduce instructor Bob (p3) who he described as a "synthetic example". Using the concept of User-Centered Design, describe which stage/phase was Laton in when creating Bob and what technique was Laton using. Based on the content listed in the corresponding slide, list two functional requirements for instructors when designing an LMS (Learning Management System).

Suggested answers:

Laton was in the phase of "Understand context of use" and he was creating a persona to describe a representative user of the LMS.

2 functional requirements (must clearly state for whom and demonstrate the "what" of the LMS)

-allow the instructor to customize the interface by changing application settings

-allow the instructor to build course pages and navigation

-allow the instructor to install plug-ins to add new features

(Or anything that was mentioned in the guest lecture and speaks to the "what" of the LMS)

Submission

Submit your answers **by 10 Aug, 11:59p** in a single PDF file to the corresponding folder on Canvas. Begin your document with a cover page stating that it is your answers for the final exam, followed by your name, SFU email, student ID, and this statement (**we will not mark your answers if this statement is missing**):

Academic honesty statement: I hereby confirm that this is my own work and I have not violated any of SFU's Code of Academic Integrity and Good Conduct (S10.01).

The name of the file should be in this format: **<firstname_lastname>_<studentID>_FinalExam.pdf**.

For example, John_Smith_012345678_FinalExam.pdf

There is no late submission for this exam. Once the due date is passed it will be closed for submission.

Your document should be using 12-pt Arial font, single spacing, with 1-inch margins. Some marks might be deducted if it deviates from the requirements.

Academic Honesty

It is expected that within this course, the highest standards of academic integrity will be maintained, in keeping with SFU's Policy S10.01, "Code of Academic Integrity and Good Conduct." In this class, collaboration is encouraged for in-class exercises and the team components of the assignments, as well as task preparation for group discussions. However, individual work should be completed by the person who submits it. Any work that is independent work of the submitter should be clearly cited to make its source clear. All referenced work in reports and presentations must be appropriately cited, to include websites, as well as figures and graphs in presentations. If there are any questions whatsoever, feel free to contact the course instructor about any possible grey areas.

Some examples of unacceptable behavior:

- Handing in assignments/exercises that are not 100% your own work (in design, implementation, wording, etc.), without a clear/visible citation of the source.
- Using another student's work as a template or reference for completing your own work.
- Using any unpermitted resources during an exam.
- Looking at, or attempting to look at, another student's answer during an exam.
- Submitting work that has been submitted before, for any course at any institution.

All instances of academic dishonesty will be dealt with severely and according to SFU policy. This means that Student Services will be notified, and they will record the dishonesty in the student's file. Students are strongly encouraged to review SFU's Code of Academic Integrity and Good Conduct (S10.01) available online at: http://www.sfu.ca/policies/gazette/student/s10-01.html.

