

Solutions to CS160 Practice Final

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Q1.

- a. The evaluate – design – prototype cycle.

(Make sure that you understand, by now, why the evaluate and prototyping phases are important from a usability standpoint.)

- b. The anti-aliasing problem refers to the phenomenon in which smooth objects (e.g. lines) appear jagged due to low resolution. Anti-aliasing is a technique to make these objects appear smoother by filling in some jagged places with gray scale or primary colors. More importantly, these pixels are filled-in in proportion to the amount of the object that crosses them.

(Make sure that you understand that ClearType is an anti-aliasing method that works best on color LCD screens. More details on ClearType at Microsoft's homepage: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/gdi/fonttext_0xgn.asp)

- c. Example of early-fusion multi-modal interfaces:

- Speech+lip

Examples of late-fusion multi-modal interfaces:

- Designer's Outpost (vision+touch)
- QuickSet (speech+pen)

(Make sure that you understand the advantages of multi-modal interfaces, the relative advantages of the speech and pen modalities, the distinction between early- and late-fusion, how late-fusion is better than early-fusion, the motivation behind multi-agent architectures, what are facilitators and blackboards, how the symbolic/statistical hybrid approach is different and better than late-fusion, how the Model-Team-Committee architecture works, and examples of multi-modal systems.)

- d. Fisheye lenses. To support a user's zoom and overview tasks on a dataset.

(Understand how QBE is an improvement over SQL in terms of usability, MDS as a 2D approach to visualizing data, the seven tasks for a visualization system, how distortion can be used to implement the focus+context view, and how 3D views facilitate navigation.)

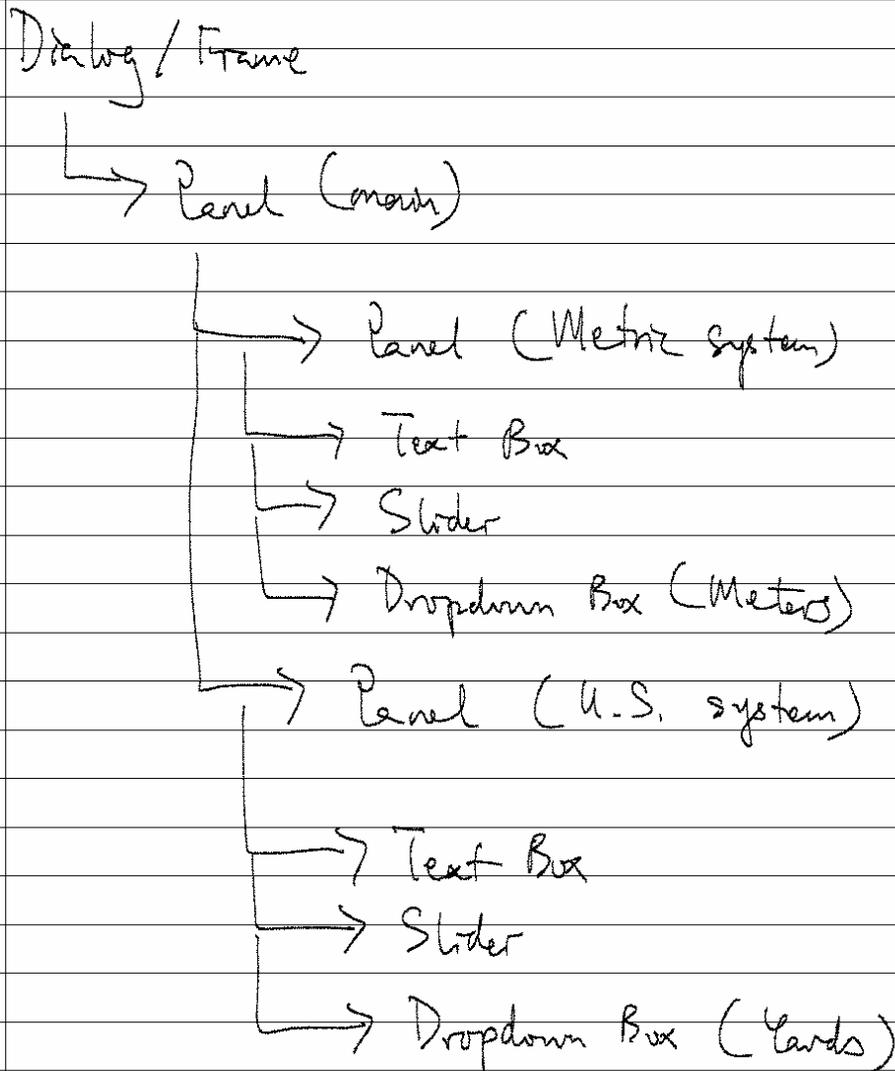
e. Need other information like:

- p-value
- number of trials / sample size
- experimental design, i.e. within- versus between-subject experiment
- probability distribution

(Understand how a quantitative analysis can be more useful to the design team than a qualitative analysis, the difference between independent and dependent variables, the difference between process and bottom-line data, their relative usefulness, that significance increase with more trials / larger sample size, independence between observations, how to decrease per-subject variance in the case of small samples, how to measure user preferences, the difference between within-subject and between-subject experiments, and their relative pros and cons.)

Q2. To demonstrate.

Q3.



(Make sure that you understand the importance of the event-driven programming paradigm vis-à-vis sequential programming, the event queue, and the main event loop. Know how the event loop interacts with the event queue, how widgets are structured into an interactor tree, and how events are propagated up this tree. Finally, understand when the stroke vs. pixel model is appropriate, how the region model is an extension of the stroke model, and outline fonts as an instance of the region model.)

Q4.

- a. Electronic communication facilitates ease and equality of participation, proposal of actionable items, and diminishes the effect of status. Positive conflict fosters creativity.
- b. Electronic communication takes more time to arrive at a decision (sometimes never reaching a consensus), but these decisions tend to be of higher quality. Nevertheless, electronic communication can sometimes involve more extreme remarks.
- c. Specific performance goals help
 - Define a set of measurable work-products
 - Facilitate group communication and constructive conflict
 - Maintain focus on getting results
 - Leveling effect, i.e. group members focus on tasks as opposed to status
 - Achieve small wins as team pursues a broader purpose
 - Goals are compelling, i.e. goals challenge and motivate group members to achieve them
- d. Higher productivity in smaller group. 3-10 group members is optimal size. Brooks' Law.

(This question is largely a recall question.)

Q5.

- i. Context-sensitive help
- ii. Help option on main menu
- iii. Help button on dialog box
- iv. Task-specific help panel in main window
- v. Basic-advanced mode switch button on toolbar (similar to "training wheels")

(Understand the difference between the quick reference, task-specific, full explanation and tutorial types of help, more advanced ideas like minimalist instruction and training wheels, the various desiderata for help, as well as the strengths and weaknesses of context-sensitive help, online tutorials, online documents and adaptive help systems. Also understand the strengths and weaknesses of the quantification, stereotype and overlay methods of user modeling, what a mixed-initiative system is, and to go about designing a help system.)

Q6.

a. These four methods were discussed in lecture and sections. Describe any three of them:

- i. Edit
- ii. Questionnaire
- iii. Deduction
- iv. Collaborative filtering

(Make sure that you know how to apply these methods in a design situation.)

b. Although we covered several design patterns in passing, we covered these two in excruciating detail:

- i. Shopping cart
- ii. Inverted pyramid

(Make sure that you are able to explain these patterns in terms of their problem statements and solution overview, apply these patterns in a design situation, and identify how these patterns are used if given an appropriate screenshot.)