

Quiz 2

This quiz is closed book, closed notes. You have 80 minutes to complete it.

Your name: _____

1. (4 points) Programmer convenience is one reason for automatic layout. Give two other reasons.

Supporting window resizing; internationalization; screen resolution differences; cross-platform widget differences; font changes; dynamic data.

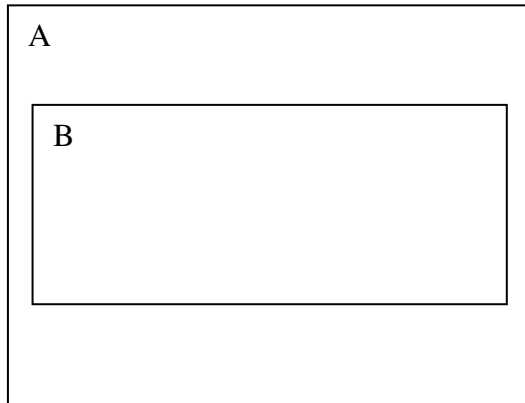
2. (4 points) List four graphic design principles that would be useful for designing a dialog box.

Simplicity; contrast; whitespace; alignment; balance & symmetry.

3. (3 points) List two techniques for achieving greater simplicity in a graphic design.

Reduction; regularity; using the same element for multiple purposes.

4. (4 points) Write constraint equations for the following layout, where rectangle B is half the height of rectangle A, centered in rectangle A, and has a 5-pixel margin around it.



You may use left, right, top, bottom, width, height, all of which are screen coordinates in pixels.

$$A.height = 2 B.height$$

$$A.width = B.width + 10$$

$$B.top = A.top + (A.height - B.height)/2$$

$$B.left = A.left + (A.width - B.width)/2$$

5. (4 points) Explain what selectivity means for visual variables, and give an example of a variable that is **not** selective.

Selectivity means that you can attend to one particular value of the visual variable, while ignoring all other values of that variable and other variables. Shape is not selective.

6. (4 points) Referring to visual variables in your answer, describe 5 different ways that you might make an advertising poster stand out on a crowded bulletin board.

Put your poster in the center of the board at eye level (position);

Make the text size or poster size larger (size);

Use bold text or a bright color (value);

Use a patterned background (texture);

Tilt the text or the poster (orientation);

Use an unusual color (hue);

Give the poster an unusual aspect ratio, make it jagged-shaped, or use an unusual font or picture (shape).

7. (4 points) Louis Reasoner is designing a grade reporting program, and he proposes visualizing the grade for each homework (0% - 100%) by the angle of a line. Give two reasons why this is a bad idea.

Orientation is neither ordered nor quantitative, but both of those comparisons are important for grades; and orientation is too short (4-8 levels) to cover the necessary range of grades.

8. (3 points) List three visual variables that can naturally represent ordered data.

Position, size, value, texture granularity

9. (3 points) List 3 of the Gestalt principles of grouping.

Proximity, similarity, closure, area, symmetry, continuity

10. (4 points) Explain how Gestalt principles of grouping help you understand the structure of this quiz page.

Proximity groups the number, point score, and question together into a single unit, separated from other units by white space.

Similarity groups the multiple choices (A, B, C, D) together.

More of a stretch: closure might help us imagine a box below each question, framed by the question and the question below it, in which to write the answer.

11. (3 points) Explain why strongly saturated colors are rarely used in good user interface designs.

Strongly saturated colors have two effects that both lead to eye fatigue: they saturate the retina's cones, and they force the lens to refocus more often.

12. (3 points) Which of the following problems are least likely to be found by user testing a horizontal computer prototype?

- A. An important toolbar button is too small and too far away.
- B. The system's response time is too slow.
- C. An icon is incomprehensible.
- D. There isn't enough room on the screen for all the information.

Choose one: B *A horizontal prototype has no backend, so its response time isn't realistic.*

13. (4 points) Give one advantage of a form builder (or GUI builder) for creating computer prototypes, and one advantage of storyboarding.

Form builders use actual widgets, so the interface is more high-fidelity in feel; and you can more easily hook in some backend if you need it.

Storyboards offer more creative freedom, the ability to draw anything without being constrained to a fixed set of widgets.

14. (4 points) Give one usability advantage of reusable widgets, and one usability disadvantage.

Advantages: external consistency; reuse of usability design and testing that was done on the widget (if any)

Disadvantages: tends to constrain designer's thinking to use widgets when a custom direct manipulation interface might be more appropriate

15. (3 points) Define toolkit layering, and give one example of a layered toolkit.

Toolkit layering is when a user interface toolkit is built on top of another toolkit, reusing some or all of its features. Swing is layered on top of AWT.

16. (3 points) Explain the difference between Swing and AWT in their approach to widgets.

AWT reuses the widgets of the native platform toolkit it's layered on, but only offers widgets that are available on all platforms it supports.

Swing reimplements its own widgets, not using the native platform widgets, but using pluggable look-and-feel to make its widgets resemble the native widgets where possible.

17. (4 points) Give two important differences between user testing and heuristic evaluation.

User testing employs representative users; heuristic evaluation uses a usability expert.

User testing is a testing method; heuristic evaluation is an inspection method.

In user testing, the facilitator should rarely help a user; in heuristic evaluation, helping the evaluator is OK once the problem has been noted.

Heuristic evaluation can find problems that might be rare or hard to uncover with user testing, like font consistency or Fitts's Law issues.

18. (4 points) Define a critical incident.

A critical incident is an event during user testing that strongly affects task performance or subjective satisfaction. Examples include errors, thrashing, curses, pleasant or unpleasant surprises.

The comments below come from a heuristic evaluation performed on a web site. Name a heuristic that justifies each of the following usability problems found during the evaluation.

19. (3 points) "The form's Clear button is too prominent."

Error prevention.

20. (3 points) "Hyperlinks are not underlined."

Consistency, or affordances.

21. (3 points) "Documents in the library are listed by an obscure product code, instead of by title."

Match the real world.

22. (3 points) "The form asks for the user's personal information every time the user visits the site."

Flexibility and efficiency.

In the following questions, you are designing a controlled experiment concerning menus.

23. (3 points) The experiment will compare conventional rectangular popup menus with radial (pie-shaped) menus. This is:

- A. independent variable
- B. dependent variable
- C. uncontrolled variable

Choose one: A

24. (3 points) The experiment will measure time to make a choice from the menu. This is:

- A. independent variable
- B. dependent variable
- C. uncontrolled variable

Choose one: B

25. (4 points) The experiment will use a within-subjects design. What does this mean?

Each subject uses both kinds of menu, and the difference in performance is used as the measurement for that subject.

26. (3 points) The experiment will only use users who have played a game that uses radial menus (such as the Sims). This decision threatens:

- A. reliability
- B. internal validity
- C. external validity

Choose one: C *Most users haven't used radial menus.*

27. (3 points) Louis Reasoner runs an enormous experiment with 20 different independent variables. He's thrilled to find that exactly one of the independent variables has a statistically significant effect ($p=0.05$) on the dependent variable. Should he publish his result? Why or why not?

No; if you make 20 significance tests at the 5% significance level, you can expect one of them to appear significant purely by chance.

28. (4 points) Explain the differences between formative evaluation and a controlled experiment.

Formative evaluation tests a prototype of a single interface in an iterative design, in order to discover usability problems that can be fixed by further design and development. The results of formative evaluation are largely qualitative.

A controlled experiment tests working implementations, in order to test a hypothesis, often involving a comparison of two or more interface alternatives rather than a single interface. The results of a controlled experiment are largely quantitative.

29. (3 points) List 3 things you should say, for ethical reasons, when briefing a user for a user test.

"We're testing the system, we're not testing you."

"Any difficulties you encounter are the system's fault, not yours."

"You can stop at any time."

"Your test results will be completely confidential."

"You are being videotaped (or audiotaped, or otherwise observed)."

"The purpose of this experiment is ..."

END OF QUIZ