

## Quiz 2

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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.*

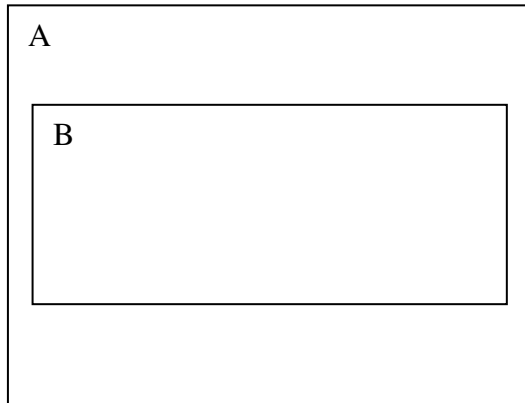
2. (4 points) List four graphic design principles that would be useful for designing a dialog box.

*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**