

Multiple Choice

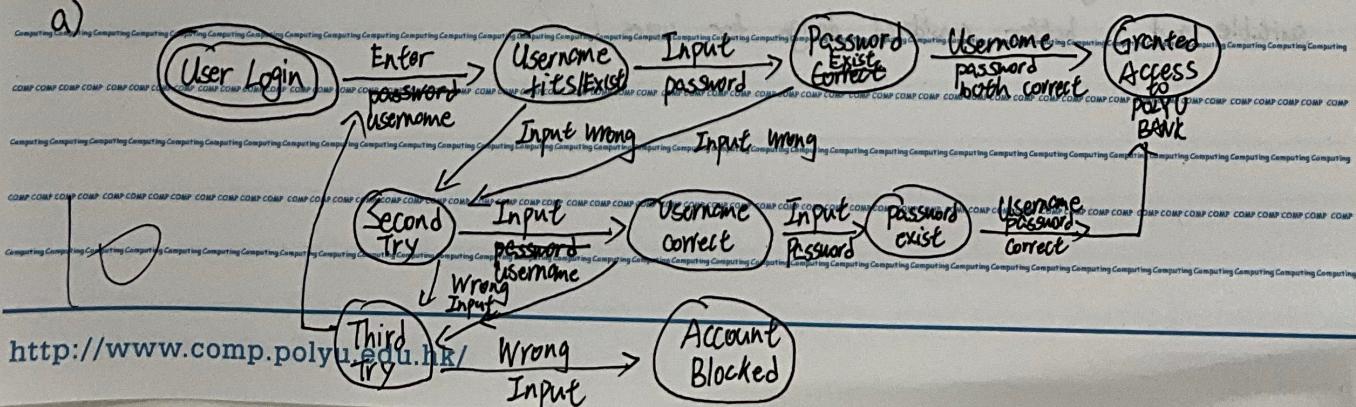
- (Q1. B) Consistency (Usability Goals): Using the same terminology and visual design across all screens
- (Q2. A) Consistency (Usability Goals):
- (Q3. D) Consistency (Usability Goals):
- (Q4. B) Consistency (Usability Goals):
- (Q5. D) How to measure difficulty of target acquisition task?
- (Q6. & B) According to Fitt's Law, the target of a target acquisition task in a rapid, cimed movement can be measured
- (Q7. A) in terms of distance of the target ( $D$ ) and the width of the target ( $W$ ) as  $ID = \log_2(D/W + 1)$ . The unit of ID is in bits
- (Q8. B) ~~4~~
- (Q9. C) ~~X~~
- (Q10. C) ~~X~~ B

Short Question

- B1) The Fitt's Law, can also measure difficulty. average -4
- a) The difficulty of a target acquisition task can be measured by the time used to accomplish the task, the longer it takes, the more difficult it is. Also, the number of mistakes can be measured to be considered the more mistakes made the more difficult.
- b) Method 1: Group relevant or visual elements can be used as the presenting of elements for clearer and understandable elements displayment.
- Method 2: Comparable or color elements can be used in visual perception to enhance the important part of elements for better [used in pattern recognition] visualization.

- c) One design strategy that will be used to prevent accidental deletion of records is to provide a confirmation dialog sign to before actually deleting, provides a second-time for user to ensure the deletion and to help prevent accidental deletion. When users presses the sign, the tile is actually deleted.

B2) POLYBANK



MEA: Goal oriented design with personalized recommendations

DR: Simplified, streamlined design focused on usability

B2)

b) Means-end Analysis: When using selects a set<sup>↑</sup> meal of food, the user can continue to order a burger, then choose drinks without quitting back to the food menu.

The route would be like: Menu → Meal chosen → Burger → Drink → Fries → Menu

It reduces number of procedures and reduces number of effort needed for users, the user can continue adding food without returning back to the menu.

Difference Reduction: For difference reduction, the different of route will be reduced, leading the user have to return back to menu every time after ordering a single order of food.

For some example ordering a burger set meal. The user will have to order a burger, return to menu, then drink back to menu, then tries finally back to menu for the order.

The route will be like: Menu → Meal chosen → Burger → Menu → Drink → Menu → Fries → Menu.

It provides more chances to change their orders instead of deleting all ordered items.

for users

A) Design A is better because it provides more options considering more different situations for users.

In Design B a user won't have the option to ~~load off~~ unload while design A has

A providing more options and considerations for users.

Design B is better. Because any drop-down menu should provide a description. It gives available actions so users can see and check for better usage

b) Design B is better, because design A has better formating of pages, the same

formating for page 1, 2, 3 in Design A provides better visual appearance and for users reduces extra time to figure out where buttons or icons are when moving to the next page. While

Design B has worse formating and increases time for users when they move from page 1 to 2 because they have to learn and find out where the icons are again.

c) Design B is better, because design B provides a more detailed explanation and functions compared to Design A as users may require different requirements on functions design B is more

suitable and a better considered design for users.

Design A is better. It is essential to keep buttons

Concise Large buttons will likely be interpreted as a text block or an ad rather than a call-to-action

# Department of Computing

## PolyU HK

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Q3 B3

high-lighted

d) Design B is better, because it provides a ^ icon for explaining what the function is and the cancel / create is placed individually below, which provides a better visualization of the format and users can easily understand the functions due to the separated icons and word formatting. It also prevents accidentally clicking as the button in design A is too small.

c) Design A is better because when meeting the same problem of having a validation fault, design B only told there is a part that is an invalid entry but users don't know exactly which one. Design A had a explanation sign to tell the users that the email part is unvalid and words explanation below. It also points out what might be the error like adding a @ which all provides better user experience than Design B.

**The Hong Kong Polytechnic University**  
**COMP3423 Human Computer Interaction**  
**Mid-term Test**  
**(Date: 26<sup>th</sup> Oct 2024. Duration: 1 hour)**

**[Total 100 marks]**

**Part A: Multiple Choices (40%, 3 marks each)**

**Answer ALL questions in this part. Select ONE option only in {A,B,C,D} for an answer.**

**Question 1 (4 marks)**

How can designers effectively apply visual perception concepts to enhance the usability of user interfaces?

- A) By using inconsistent layouts and random colors to create surprise.
- B) By leveraging familiar icons and consistent design elements to aid recognition.**
- C) By minimizing visual feedback to reduce distractions.
- D) By prioritizing complex animations over straightforward interactions.

**Question 2 (4 marks)**

In a hypothetical email client, identify the problem with the icons used for different functions and determine which section contains explanations for these icons.

- A) The icons lack descriptive labels, causing confusion.**
- B) Icons are not grouped logically, leading to disorganization.
- C) Similar icons are perceived as unrelated due to inconsistent design.
- D) The icons represent multiple meanings, causing ambiguity.

**Question 3 (4 marks)**

Wireframes most usefully indicate

- A) the color scheme of a user interface.
- B) the reasons why users need particular tasks.
- C) the order of user actions needed for completing a task.

D) which user controls are placed on a user interface.

**Question 4 (4 marks)**

Which one of these is the best reason for taking care to design a good human-computer interface?

- A) Well-designed HCIs allow the software to be sold at a better price
- B) Some users are not computer experts**
- C) Fewer computer resources are to be used
- D) The software may run faster

**Question 5 (4 marks)**

Which of the following is not an interface style?

- A) Command line/command prompt
- B) Menus
- C) Natural Language
- D) Voice Recognition**

**Question 6 (4 marks)**

What is a semantic network?

- A) A model of short-term memory
- B) A model of long-term memory**
- C) A model of physical memory
- D) A model of short and long-term memory

**Question 7 (4 marks)**

What principle describes the tendency for users to focus on the most visually prominent elements on a screen?

- A) Visual hierarchy**
- B) Gestalt principles
- C) Fitt's Law
- D) Affordance

**Question 8 (4 marks)**

What does cognitive load refer to in the context of interface design?

- A) The amount of physical effort required to use a device
- B) The mental effort required to process information**
- C) The time taken to learn a new technology
- D) The emotional response to an interface

**Question 9 (4 marks)**

Which of the following is an example of a visual cue that enhances user interaction?

- A) A long text description with no images
- B) A pop-up ad that interrupts the user
- C) A loading spinner indicating processing**
- D) A random assortment of icons without labels

**Question 10 (4 marks)**

What is consistency in terms of usability goals?

- A) Compatibility across different product versions
- B) Using the same terminology and visual design across all screens**
- C) Ensuring all features are available on every platform
- D) Providing the same level of performance regardless of user location

- End of Part A -

**Part B: Short Questions (60 marks)**

**Answer ALL questions in this part.**

*Note: A correct point usually carries two marks, while a few carry one mark.*

**Question B1 (20 marks)**

- (a) How to measure the difficulty of a target acquisition task? (10 marks)
- (b) Describe two ways that designers use pattern recognition in visual perception to improve the usability of their user interfaces. (8 marks):
- (c) Describe one design strategy that will be used to prevent the accidental deletion of records in an application. (4 marks)

Suggested Answer:

- (a) According to the Fitts' law, the difficulty of a target acquisition task in a rapid, aimed movement can be measured in terms of the distance of the target (D) and the width of the target (W) as,  $ID = \log_2(D/W+1)$ . The unit of ID is in bits. (10 marks)
- (b) Pattern recognition can enhance the usability of user interfaces (UIs) in several ways (any two; 4 marks each)
  - Consistent layouts, colors, and iconography help users form mental models of the interface's functionality. For example, using the same color for action buttons on different screens lets users quickly identify their purpose, improving predictability and reducing confusion.
  - Familiar Icons and Symbols: Using well-known icons, such as a magnifying glass for search or a trash can for deletion, leverages users' prior knowledge. This familiarity lets users intuitively understand functions without learning new symbols, making the interface more user-friendly.
  - Creating a clear hierarchy in content helps users recognize patterns in information flow. Designers can use headings, subheadings, and visual indicators such as bullet points to guide users through the interface, making it easier to locate information quickly.
  - Immediate feedback for user actions, such as highlighting a button when hovered over, helps reinforce recognition patterns. This feedback ensures that users' interactions are acknowledged, which builds confidence in navigating the interface.
  - Usability testing reveals how well users recognize design patterns. Observing where users struggle can help inform changes that improve recognition and usability, ensuring the design meets user expectations.
- (c) Any one of following (4 marks)
  - Confirmation Prompts:
    - Implement a confirmation dialog that appears after the delete action is initiated. This dialog should clearly state the consequences of the deletion, such as "Are you sure you want to delete this record? This action cannot be

undone." Users must then confirm their choice by clicking "Confirm" or canceling the operation.

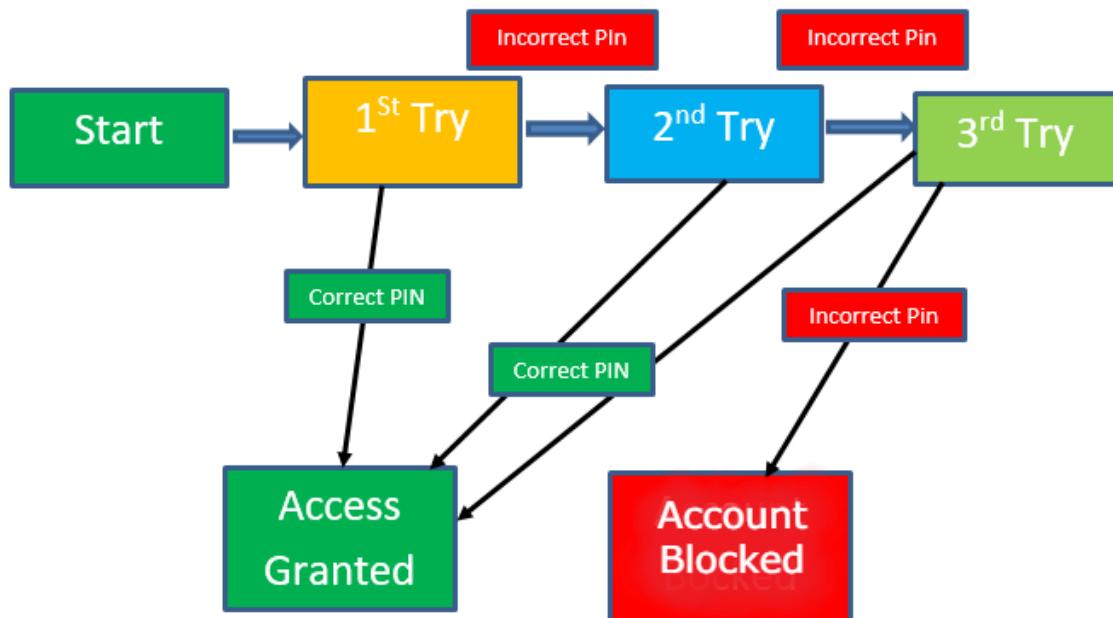
- Secondary Confirmation:
  - After a record is deleted, provide an option to undo the action for a brief period (e.g., a toast message that appears at the bottom of the screen with an "Undo" button). This allows users to recover from accidental deletions.

### Question B2 (20 marks)

- (a) Draw a *State Transition Network* (STN) to describe the login function of the mobile app of POLY BANK (a hypothetical bank). If the user enters the correct password, access to the system is granted. If the user enters an incorrect password, the system allows him or her to try again, but if the user enters the wrong password three times in a row, his or her account will be blocked. (10 marks)
- (b) How do *Means-end Analysis* and *Difference Reduction* approach differ when designing a food ordering menu interface to enhance user experience? (10 marks)

#### Suggested Answer:

- (a) Each wrong or missing state/transition deducts 1 mark.



(b)

#### **Means-end Analysis:**

Feature: Goal-oriented design with personalized recommendations. (2 marks)

**Design in Food Ordering App:** The interface prominently displays sections for popular meals, dietary preferences (vegan, gluten-free), and meal types (breakfast, lunch, dinner). Users can easily access personalized recommendations based on past orders, making it intuitive to find what they want. (3 marks)

### Difference Reduction:

Feature: Simplified, streamlined design focused on usability. (2 marks)

**Design in Food Ordering App:** The app features a minimalist menu with categorized sections (e.g., appetizers, main courses, desserts), reducing cognitive load. The checkout process is streamlined to a single page, allowing users to review and finalize their orders quickly without navigating back and forth. (3 marks)

*Other reasonable answers are accepted, as long as the students able to relate them to a proposed design and relevant to food ordering functionalities:*

- *Means-end Analysis is holistic and strategic, whereas Difference Reduction is tactical and iterative.*
- *Means-end Analysis is goal-oriented, while Difference Reduction is about minimizing gaps.*
- *Means-end Analysis designs with user goals in mind, while Difference Reduction emphasizes usability and simplicity through gradual improvements.*

### Question B3 (20 marks)

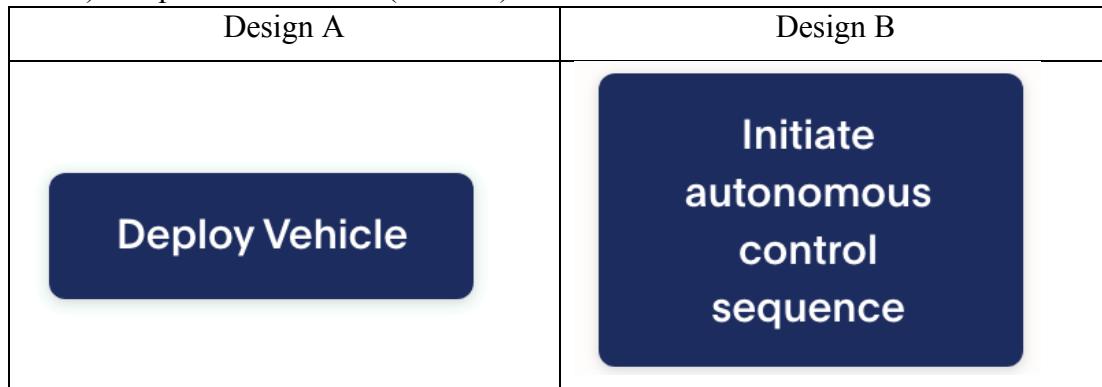
(a) Two drop-down menu designs are given below. Determine whether design A or B is better (2 marks) and provide a reason. (2 marks)

Design A	Design B
<div style="background-color: #f0f0f0; padding: 10px;"> <div style="background-color: #333; color: white; padding: 5px; margin-bottom: 5px;"> <b>Select an action</b> ▾         </div> <div style="background-color: #fff; padding: 5px; border: 1px solid #ccc; border-radius: 5px;">           Load            Unload            Send to Location            Turn On            Turn Off            Raise Lift         </div> </div>	<div style="background-color: #f0f0f0; padding: 10px;"> <div style="background-color: #333; color: white; padding: 5px; margin-bottom: 5px;"> <b>Select an action</b> ▾         </div> <div style="background-color: #fff; padding: 5px; border: 1px solid #ccc; border-radius: 5px;">           Available Actions            Load            Send to Location            Turn Off            Raise Lift         </div> </div>

(b) Two sets of web UI with different design patterns and menus are shown below. Determine whether design A or B is better (2 marks) and provide a reason. (2 marks)



- (c) Two button designs are given below. Determine whether design A or B is better (2 marks) and provide a reason. (2 marks)



- (d) Two pop-up box designs are given below. Determine whether design A or B is better (2 marks) and provide a reason. (2 marks)

Design A	Design B
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<p>Create New Job: Creating a new job allows you to set up the tasks you wish for the autonomous vehicle to perform. You can reorder and remove tasks at any time. <a href="#">Cancel / Create</a></p>	<p><b>Create New Job</b> <span style="float: right;">X</span></p> <p>Creating a new job allows you to set up the tasks you wish for the autonomous vehicle to perform. You can reorder and remove tasks at any time.</p> <p style="text-align: center;"><a href="#">Cancel</a> <span style="background-color: #2e71a1; color: white; border-radius: 5px; padding: 5px 10px; border: none; margin-left: 10px;">Create</span></p>
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- (e) Two fill-in form designs are given below. Determine whether design A or B is better (2 marks) and provide a reason. (2 marks)

Design A	Design B
<p>First Name</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">Caitlynn</div> <p>First Name</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">Haapala</div> <p>Email</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">cait48@gmail.com <span style="border: 1px solid red; border-radius: 50%; padding: 2px 5px; margin-left: 10px;">!</span></div> <p style="border-left: 2px solid red; padding-left: 5px; margin-top: 10px;">Oops! This doesn't look like a valid email address. Try adding '@' before the domain name. <a href="#">Accepted email formats</a></p>	<p>validation fault - format does not match database. Invalid entry.</p> <p>First Name</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">Caitlynn</div> <p>First Name</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">Haapala</div> <p>Email</p> <div style="border: 1px solid #ccc; padding: 5px; width: 100%;">cait48@gmail.com</div>

#### Model Answer:

- (a) B is better. Any drop-down menu should have a description. Otherwise, it is a bold list of random words and hard to limit to a specific one. Even the most confident client will hesitate when picking one. (4 marks)
- (b) A is better. A has a consistent UI means using similar design patterns, identical terminology in prompts, homogenous menus and screens, and consistent commands throughout the interface. (4 marks)
- (c) A is better. It is essential to keep buttons concise. Large buttons will likely be interpreted as a text block or an ad rather than a call-to-action. (4 marks)
- (d) B is better. These boxes are meant to explain concepts, call to action, or confirm a certain action. In the bad example, the box does not give the option to close the window, and the "Cancel/Create" buttons are too small to create a call to action. The good example has solved these two issues. (4 marks)
- (e) A is better. A standard form might be tricky to fill out when something goes wrong. A good solution is to highlight the field with an issue so the user can correct or edit the

line quickly. Imagine yourself confronted with these two forms and pick the one that would be easier to correct. (4 marks)

- End of Mid-term Test -