BAIT2203 Introduction to Human Computer Interaction

Tutorial 1: Introduction to HCI

Question 1

"It is easy to make a *user interface* but it is hard to make a good one" (Lauesen, 2005).

(a) Describe what a user interface is. Give 2 e.g. (*own examples*) to support your answer. (pg13)

The User Interface is the space where interactions between users and a system, including the design and layout of screens, hardware, and other interactive elements.

Example: keyboard, mouse

(b) Referring to any 2 interactive products/systems/software that you have used before *(e.g. coffee vending machine, GPS, TV remote controller, computer game, e-commerce website, popular word processor, Google Classroom, etc), w*rite down what it is that you like about each of them and what it is that you do not like. Describe your overall experience in using each of them *(e.g. is it usable? is it fun to use? Does it helps you to achieve your goals easily? etc).*

interactive products/systems/software	like / do not like	experience
coffee vending machine	like	It offers a simple and quick coffee service without the need to wait in long lines, which is very convenient for me.
	do not like	The taste of the coffee is not as good as what I get at cafes.
GPS	like	It is convenient for me to navigate to unfamiliar places quickly and efficiently.
	do not like	I find that GPS systems can sometimes provide unclear directions, leading to longer routes than necessary.

Question 2

(a) What do you understand by the term "*usability problems*". Give 2 examples (*own examples*) to support your answer.

Usability problems are difficulties that users face when interacting with a poor design system.

- A mobile app's similar settings are not placed in the same menus, making it hard for users to find and adjust preferences.
- A web application requires users to fill out long, multi-page forms without clear instructions or the ability to save progress, leading to user frustration and errors.

(b) Suggest ways to improve the usability of a product/system/software. Explain your answer.

Design:

- Focus on user needs with intuitive layouts and accessible features.

- Ensure consistency in design for ease of learning.

Construct:

- Build a prototype that mirrors the design for practical user interaction.
- Include responsive feedback and clear error guidance.

Test:

- Perform usability tests to assess user experience and identify pain points.
- Gather both quantitative and qualitative data for comprehensive insights.

Iterate:

- Refine the design with user feedback to resolve issues.
- Repeat the cycle until the product meets usability goals.

Focus on user feedback

Question 3

(a) What are the disciplines that contributed to HCI? (pg33)

- **Computer Science**: Focuses on the construction of software and provides insights into the capabilities and limitations of the technology used in interactive systems.
- Cognitive Psychology: Studies how information is processed and represented in the mind, offering knowledge about the mental capabilities and limitations of users.
- **Ergonomics**/Human Factors: Examines the relationship between human beings and their working environment. It provides knowledge on designing tools and environments to fit the users' capacities and capabilities, rather than the other way around.
- Social and Organizational Psychology: Along with other disciplines, contributes to understanding user behavior in social contexts and organizational settings.

(b) Alan Dix (2004) stated that, *"It is not possible to design effective interactive systems from one discipline in isolation*". Explain why this is the case.

Design effective interactive systems require a blend of diverse expertise because interactive systems that are user-friendly, efficient, and effective at meeting user needs can only be achieved by combining knowledge from various disciplines.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

1. List 3 benefits of system/software/product with good interface design. (pg18)

Enhanced User Experience: A well-designed interface improves usability, making it easier and more enjoyable for users to interact with the system or product.

Increased Efficiency: Clear navigation and intuitive controls reduce the time users spend learning how to use the software or system, leading to faster task completion.

Reduced Errors: Intuitive design minimizes user errors, as users can easily understand and anticipate how to interact with the interface effectively.

2. List 3 negative effects of system/software/product with bad interface design. (pg30)

Poor User Experience: Users struggle to navigate and use the software efficiently, leading to frustration and dissatisfaction.

Increased Learning Curve: A confusing or poorly designed interface requires more time and effort for users to understand and learn how to use the software effectively.

Higher Error Rates: Users are more likely to make mistakes or encounter errors due to unclear instructions, confusing layouts, or intuitive controls.

3. Read the following paper/web page and highlight some points that made the most impact on you. Be focus on issue related to HCI.
    a. “Guaranteeing Rights for the User” by Clare-Marie Karat. http://www.research.ibm.com/compsci/spotlight/hci/p29- karat.pdf
    b. “Ubuntu's Mark Shuttleworth on shaking up system software” by By Leo Kelion. http://www.bbc.com/news/technology-17916879

From "Guaranteeing Rights for the User" by Clare-Marie Karat:

User Empowerment: HCI research often focuses on empowering users by ensuring interfaces are intuitive and accessible, allowing users to effectively control and understand their interactions with technology.

Ethical Considerations: Discussions may highlight the ethical responsibilities of designers in HCI, emphasizing the importance of designing systems that respect user privacy, autonomy, and dignity.

Usability Challenges: Papers often discuss challenges in designing interfaces that cater to diverse user needs and abilities, stressing the importance of inclusive design practices.

From "Ubuntu's Mark Shuttleworth on shaking up system software" by Leo Kelion (based on typical HCI-related issues discussed by industry leaders):

Innovation in User Interfaces: Industry leaders may discuss efforts to innovate and improve user interfaces to enhance user experience and productivity.

Accessibility and Inclusivity: There might be a focus on making software more accessible to a broader audience, reflecting HCI principles of designing for all users, regardless of their abilities.

User-Centered Design: Leaders often advocate for user-centered design approaches, where user feedback and usability testing play crucial roles in shaping software interfaces.

Tutorial 2: User Analysis & Task Analysis

Question 1

"To the user the UI is the system. Most interfaces need to be designed to accommodate both the novice and expert users at the same time."

Do you agree with the above statement? Give 2 examples (own examples) to support your answer.

I agree Smartphone Cameras: They feature automatic modes for simplicity, catering to novices, alongside manual settings that provide experts with control over focus, exposure, and ISO. Microsoft Word: It presents a straightforward UI for novices, highlighting fundamental text editing tools, and integrates an advanced menu system and keyboard shortcuts for expert users who require more complex functionalities.
Make tutorials for beginners/novice users, advance menus or shortcut keys for expert users so that no complain from both of them Eg: Google

Question 2

(a) How do the requirements of an expert user different from those of a novice? Present your answer in a table format.

Aspect	Expert User Requirements	Novice User Requirements
Complexity	Can handle complex features and workflows.	Prefers simple, streamlined interfaces.
Learning Curve	Willing to invest time in learning advanced features.	Needs a minimal learning curve for basic tasks.
Access to Tools	Requires quick access to a wide array of tools.	Needs easy access to basic tools with guidance.
Customization	Desires the ability to customize the interface.	Benefits from a preset, user-friendly layout.
Support	Look for comprehensive documentation and forums.	Relies on clear, concise help sections and tutorials.
Efficiency	Values features that increase productivity.	Focuses on ease of use and step-by-step guidance.

Comparison	Novice	Expert

Screen density	Low (简洁)	High (多内容)
Shortcut	no	yes
Feedback	Detailed	Brief

(b) If you are developing a system that needs to cater for both the novice and expert users at the same time, which category of user would you pay more attention to? Give reasons for your answer.

When developing a system for both novice and expert users, I would pay more attention to the novice users for the following reasons:

Broader User Base: Novices often represent the larger segment of users, making it essential to ensure the system is accessible to them.

Usability: If a system is easy for novices to use, experts can still use it effectively but with more advanced features.

Learning Foundation: A solid foundation for novices allows them to grow into more proficient users over time, while experts can adapt to the system more quickly.

Question 3

To design an effective interactive system, it is necessary to know the answers to the following 3 questions:

1. Who are the users?
2. What are the tasks?
3. What is the environment in which the system will operate?

Give reasons why it is important for a designer to have the answers to the above 3 questions?

Who are the users?

Understanding the user demographic, preferences, and needs allows the designer to create an interface that caters to the target audience effectively.

What are the tasks?

Identifying the tasks the users will perform with the system helps in designing features and workflows that support those tasks efficiently.

What is the environment in which the system will operate?

Considering the environment ensures the system's design accommodates the physical, social, and technical context in which it will be used, enhancing usability and functionality.

Reasons: won't lost when development

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

Examine a(n) interface/computer application/website that you are UNFAMILIAR with.

(i) Which type of user(s) does it cater for?

(you only need to state whether the interface/computer application/website is designed for novice or expert user or both)

(ii) How do you know that this is the case?

(iii) How does it make you feel as a novice user of that particular system?

(iv) How could it be improved?

Type of User: If I were to examine an unfamiliar website, for instance, a complex data analytics platform, I would determine it caters for expert users.

Reasoning: The presence of jargon-heavy language, a dense layout with numerous controls, and minimal guidance would suggest it's designed for users with specific knowledge or expertise.

Feeling as a Novice: As a novice, I might feel overwhelmed and confused by the interface, struggling to find where to start or how to perform basic tasks without assistance.

Improvement Suggestions: Adding a guided tutorial for first-time users, simplifying the layout, and providing a more accessible help section could improve the experience for novice users.

Examine a(n) interface/computer application/website that you are FAMILIAR with.

(i) Which type of user(s) does it cater for?

(you only need to state whether the interface/computer application/website is designed for novice or expert user or both)

(ii) How do you know that this is the case?

(iii) How does it make you feel as a user of that particular system?

(iv) Do you have any suggestion for improvement?

Type of User: A familiar example could be a widely-used social media platform, which caters for both novice and expert users.

Reasoning: The interface uses simple language, intuitive icons, and a streamlined layout for novices, while also offering advanced features, such as detailed privacy settings and post-boosting options, for expert users.

Feeling as a User: As a familiar user, I would feel comfortable navigating the platform, understanding its features, and appreciating the ease of use it provides.

Suggestions for Improvement: To enhance the platform, incorporating AI-based content curation to better suit user preferences or adding more customization options for expert users could be beneficial.

Tutorial 3: The User's Physical Capabilities

Question 1

(a) Briefly explain the meaning of *cognition*.

Cognition is the mental process of interpreting and understanding information received from senses like vision, hearing, and touch.

(b) Some interfaces/displays are hard to interpret *(e.g. it is confusing or difficult to comprehend).* Find 2 examples of such interface and bring it to the classroom. *The 2 examples must be of websites/software developed by Malaysian companies only.* Point out which part(s) of the interfaces/displays that are hard to interpret/confusing/difficult to comprehend. Explain your answer. Note: Use PowerPoint slides to show the 2 examples. Recommend how the problems can be solved.

Example 1: Shopee (E-commerce Website)

Issue: Confusing Navigation and Advertisements

Explanation:

Users often accidentally click on advertisements due to their placement and unclear labels.

Instructions on the website are not clear, making it hard for users to achieve their goals.

Solution:

Improve clarity in content presentation using visuals and audio cues.

Optimize advertisements by adjusting their appearance to prevent accidental clicks.

Example 2: MyRAPID PULSE (Transportation App)

Issue: Inaccurate Route Information

Explanation:

Users experience inconsistencies in bus route and status updates, despite refreshing multiple times.

This confusion makes it difficult for users to locate buses and trust the route information.

Solution:

Enhance the app's performance to ensure real-time updates.

Implement reliable systems to maintain accurate and up-to-date information.

Question 2

(a) Visit the link below and then carry out the following activities:
http://architectingusability.com/2011/05/26/using-the-gestalt-laws-of-perception-in-ui-design/ Prepare PowerPoint slides with brief notes and examples and then teach the class the following 2 laws - Law of proximity

- Law of similarity

Law of Proximity:

Objects placed close together are perceived as a group.

Example: Labels and input fields on a form should be closer to indicate their relationship.

Law of Similarity:

Objects sharing similar attributes (like color or shape) are perceived as related.

Example: Using consistent colors for related elements helps users understand their grouping.

(b) Comment the 2 figures below in terms of its *figure(foreground)* and *ground(background).* (hints: using your favorite browser search for the subject "FIGURE and GROUND" for more information).

These figures use black and white colors with high contrast, making it easy to perceive either the white vase against a black background or two faces against a white background. This shows how our perception of figure (foreground) versus ground (background) can change based on which color we interpret as the figure.

(c) "For UI design, the *ground(background)* of the UI should be designed in such a way that it supports the *figure(foreground)*." Do you agree with this statement? Explain your answer.

Yes, I agree. In UI design, the background should support the foreground (main content) to enhance usability. A well-designed background directs attention to important elements by adjusting attributes like contrast, size, and separation. This helps users quickly identify key information and navigate the interface more effectively. Effective background design improves user experience by clarifying what's important and reducing visual clutter, ensuring interfaces are intuitive and easy to use.

Question 3

(a) Identify the 3 common applications of sounds. State which 2 are the most commonly used in HCI. Give 2 examples (*own examples*) and elaborate your answer.

Feedback: Alerts and notifications (e.g., error sounds in Windows).

Attracting Attention: Mobile notifications and emergency sirens.

(b) Give 2 examples of systems (*own examples*) that should use sound for *FEEDBACK* and/or

ATTRACTING attention but unfortunately currently it is not using it. Justify your answer.

Public Toilet Occupancy Indicators:

Lack auditory feedback to indicate if a toilet is occupied, causing inconvenience.

Automated Checkout Systems:

Depend solely on visual cues, which can be challenging for illiterate or visually impaired users.

You are my sunshine~~ My only sunshine~~

You make me happy~~ The sky are great~~

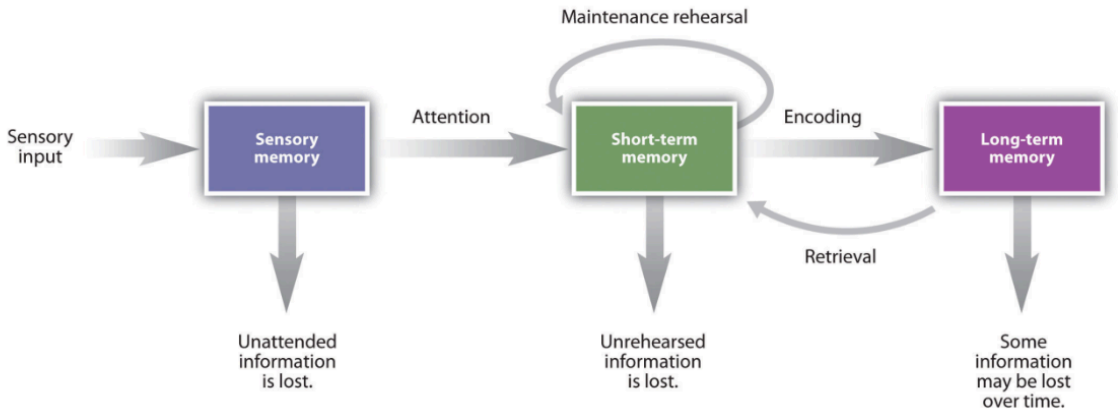
Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

Find 2 interface/displays where the information presented are highly comprehensible, make sense and visually appealing. Point out which part(s) of the interface/displays are highly comprehensible, make sense and visually appealing. Suggest if it can be further improved.

Tutorial 4: The User Mental Capabilities

Question 1

(a) Draw a diagram to illustrate the 3 types of human memory. Explain your answer.



Sensory Memory: The conscious memory area, which processes information from the senses. For example, information from the eyes, ears, nose, tactile channels.

Short-term Memory: It is a memory area capable of holding a limited amount of information for a very short period of time .

Long-term Memory: This is an area of memory where information is stored and can be retrieved over a long period of time.

(b) Complete the table below to highlight the differences between STM and LTM.

	STM	LTM
CAPACITY	Limited	Infinite
ACCESS	Rapidly	TIme needed
DECAY	Rapidly	Less Accessible

(c) According to Miller (1956), STM can hold between 5 to 9 chunks or pieces of information for a very short period of time. Based on Miller's studies on the capacity of STM, comment on whether it is necessary for a designer to limit the number of items displayed in a menu to a maximum of 9? Give reasons for your answer.

It is **not necessary** to limit menu items to 9, but it is recommended for simplicity. This is because, if there are more items on the menu, sub-menus or hierarchical structures can be used to manage

complexity. Good design principles and user testing help ensure usability.

Question 2 (Present your answers using PowerPoint slides)

(a) Give 2 examples (*own examples*) of interfaces/displays where you are expected to remember more than what is reasonable. Explain your answer.

- **Complex Software Toolbars**: Some advanced software tools have multiple toolbars with dozens of icons and options, making it hard to remember and find specific functions quickly.
- **Overloaded TV Remote Controls**: Remotes with numerous buttons for various functions can overwhelm users, making it difficult to remember what each button does and navigate effectively.

(b) Give 2 recommendations on how interfaces/displays should be designed to avoid forcing the user to remember more than what is reasonable. Discuss whether these recommendations must be followed all the time.

- **Help Users' Memories with Simple Procedures**: Use clear, step-by-step instructions and simplify tasks into manageable steps. This makes it easier for users to remember and follow procedures.
- **Design Interfaces for Recognition**: Use familiar icons, labels, and categories so users can recognize options rather than having to recall them from memory.
- **Discussion**: These recommendations should generally be followed to enhance usability, but flexibility is sometimes needed based on the context and complexity of the interface.

Question 3

"In HCI, mental model refers to the user's current understanding of how "something" works (e.g how a system works). Very often the user's mental model does not match with what the system actually does".

Explain the above statement by using a suitable example *(the example provided must be based on your own experience).*

Example: When using a file management app, users might think that clicking a folder's icon will open it in a new window, similar to how a physical folder works. However, the app might instead show the folder's contents within the same window, which can confuse users if their mental model is based on the physical world.

Explanation: This mismatch between the user's expectations (mental model)

and the system's actual behavior can lead to confusion and inefficiency.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

The understanding of human mental capability and limitation enable designer to create more usable systems. Suggest some of the guidelines of UI design related to the studies of human mental capability and give an example for each of the principle.

Examine one of your favourite and not so favourite applications. What sort of demands do they make upon you as a user? Are you expected to REMEMBER more than what is reasonable? Discuss.

"Memory and learning are closely linked and it is important to consider the ways in which people learn if effective human- computer systems are to be constructed." Comment on the statement above and explain how studies of HCI contribute to human learning.

Tutorial 5: Design Guidelines

Question 1

One of the Shneiderman's 8 golden rules of interface design is *"Strive for consistency".*

(a) Explain what this golden rule means.

(b) Explain what you or your group must do in order to apply this guideline to your HCI assignment (i.e. your HCI assignment's prototype).

a)

It means that similar elements in the interface should behave in similar ways, and visual elements should follow a coherent style throughout the application or website.

b)

Visual Design: Use the same colors, styles, and fonts for similar elements (e.g., buttons) across the entire prototype.

Layout: Position key elements like menus and buttons in the same places on all screens.

Functionality: Ensure similar actions produce the same results everywhere in the prototype.

Language: Use consistent terminology for labels and instructions.

Navigation: Keep navigation structures and placement consistent across different pages or sections.

Question 2

(a) Explain in details the good things and the bad things about the *Shneiderman's 8 golden rules* of interface design.

(b) In your opinion are these UI design guidelines useful to software developers? Justify your answer.

a)

1. Strive for Consistency

- **Good Things:**
  - Makes the interface easier to use and understand.
  - Helps users learn faster and reduces errors.
- **Bad Things:**
  - Strict consistency can limit creativity and innovation.
  - Some situations may require deviations for clarity.

2. Enable Frequent Users to Use Shortcuts

- **Good Things:**
  - Increases efficiency for experienced users.

    - Allows customization for better user experience.
- **Bad Things:**
    - Shortcuts may confuse new users.
    - Can add complexity to the design.

3. Offer Informative Feedback

- **Good Things:**
    - Reassures users that actions are successful.
    - Helps users quickly identify and fix errors.
- **Bad Things:**
    - Too much feedback can overwhelm users.
    - Poorly worded feedback may confuse rather than help.

4. Design Dialogs to Yield Closure

- **Good Things:**
    - Clearly indicates task completion, giving a sense of achievement.
    - Provides a structured approach to completing tasks.
- **Bad Things:**
    - May add unnecessary steps to the process.
    - Can be inflexible for more iterative workflows.

5. Offer Simple Error Handling

- **Good Things:**
    - Clear messages guide users in resolving issues.
    - Reduces user frustration when errors occur.
- **Bad Things:**
    - Simple messages might not provide enough detail for complex problems.
    - May overlook underlying issues.

6. Permit Easy Reversal of Actions

- **Good Things:**
    - Encourages experimentation without fear of irreversible mistakes.
    - Provides flexibility in actions.
- **Bad Things:**
    - Implementing undo features can complicate design.
    - Users might misuse the feature and rely too heavily on it.

7. Support Internal Locus of Control

- **Good Things:**
    - Empowers users and makes them feel in control.
    - Increases satisfaction with the interface.
- **Bad Things:**
    - Too many options can overwhelm users.
    - Extensive control features can complicate the design.

8. Reduce Short-Term Memory Load

- **Good Things:**
    - Makes navigation easier by displaying relevant information.
    - Improves usability by minimizing cognitive effort.
- **Bad Things:**
    - Too much visible information can clutter the interface.

- Constantly displaying all information may detract from focus.

b)

Yes, they are useful.

Justification:

1. **Improved Usability:** They help create intuitive and user-friendly interfaces.
2. **Reduced Development Time:** Following these principles can lead to fewer revisions and easier testing.
3. **User-Centric Focus:** They emphasize understanding user needs, leading to better designs.
4. **Clear Guidance:** They provide a framework for evaluating and enhancing interface designs.

Using these guidelines can lead to more efficient, effective, and user-friendly software applications.

Question 3 (Present your answers using PowerPoint slides)

(a) Download and read the article "*The Case Against User Interface Consistency*" by Jonathan Grudin. (read pages 1164-1167 is enough).

https://www.microsoft.com/en-us/research/publication/case-user-interface- consistency/

Based on the above article, mention an example of one of the best designs that violate the guideline "*consistency*". Explain your answer.

Example: Microsoft Office Ribbon Interface

- **Explanation:**
  - **Design:** The Ribbon interface replaced the traditional menu and toolbar system with a tabbed layout in Microsoft Office.
  - **Consistency Violation:** It moved away from the consistent menu structures used in previous versions of Office and other software.
- **Why It Works:**
  - **Improved Usability:** The Ribbon organizes tools and commands by task, making them easier to find and use.
  - **Better Workflow:** Users can see all relevant options at once, rather than navigating through multiple menus.
  - **Adaptation:** Even though it was a break from consistency, users adapted to it and found it more intuitive.

(b) Give an example (own example) of a good UI design that violate the guideline "*consistency*". Explain your answer.

Example: Google Search Results Page

- **Explanation:**
  - **Design:** The page shows different types of content (websites, images, videos, news) in different layouts.
  - **Consistency Violation:** Unlike standard search engines that use one consistent format for all results, Google uses different designs for each type of content.
- **Why It Works:**
  - **Easier Navigation:** Different layouts help users quickly find and interact with the type of content they're interested in.
  - **Better Usability:** Tailoring the design to each content type makes the information clearer and more accessible.
  - **Improved Focus:** Distinct designs for each content type help users focus on what they need without getting confused.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

Question 4 *(AACS5194(B) - 06/07 April/May Exam)*

Suggest one situation where it is impossible to provide a consistent user interface.

Question 5 *(AACS5194(A) - 06/07September Exam)*

Comment on how the Shneiderman's 8 golden rules of interface design may be used in the HCI design process.

Tutorial 6: Techniques To Draw The User's Attention and Error Messages

Question 1 (Present your answers using PowerPoint slides)

(a) Susie is a new programmer working with you in a software house. She would like to know how to use colours effectively for screen output. Give her some guidelines that might be useful to her. For each guideline, give an example (own example) to convince her.

1. Highlight Key Information
    a. Guideline: Use bright colors to draw attention to important elements.
    b. Example: Use green to highlight a successfully completed task.
2. Ensure Sufficient Contrast
    a. Guideline: Make sure text contrasts well with the background for readability.
    b. Example: Use white text on a black background for better readability.
3. Be Consistent
    a. Guideline: Use the same colors for similar types of information or actions.
    b. Example: Always use red for error messages across the application.
4. Avoid Overuse of Colors
    a. Guideline: Stick to a limited color palette to avoid confusion.
    b. Example: Use only three distinct colors to represent different data categories.
5. Check for Color Blindness
    a. Guideline: Choose colors that are distinguishable to all users, including those with color blindness.
    b. Example: Combine colors with text labels or symbols to indicate status.
6. Consider Cultural Implications
    a. Guideline: Be aware of the cultural significance of colors and choose appropriately.
    b. Example: Use yellow for warnings instead of red to avoid negative connotations in some cultures.

(b) You have been asked to help in the development of an online Stocks System. Table 1 below shows some of the important information that must be published on the main page

i.e. the most active stocks for a particular trading day. Your software manager would like to seek your advice on how to use proper colours to

enhance the usability of the Stocks System.

Table 1: Most Active Stocks

Stock Code	Name	Volume	Changes
8200	GENETECH	2,500,000	+1.60
0028	AIR COMMUNICATION	1,200,000	+0.80
5303	IRIS	900,000	0.00
5088	YXL	80,000	0.00
7110	CHEE KEE	60,000	-1.50

Required:

Demonstrate how you may apply colours to the information given in Table 1 to enhance the usability of the Stocks System. Justify the choice of colours used.

Application of Colors

Here's how the color coding can be applied to Table 1:

Stock Code	Name	Volume	Changes
8200	GENETECH	*2,500,000*	**+1.60** (Green)
0028	AIR COMMUNICATION	*1,200,000*	**+0.80** (Green)
5303	IRIS	*900,000*	**0.00** (Grey)
5088	YXL	*80,000*	**0.00** (Grey)
7110	CHEE KEE	*60,000*	**-1.50** (Red)

Summary

1. **Volume**: Use neutral colors (light grey/black) for readability.
2. **Changes**:
   - Green for positive changes.
   - Red for negative changes.
   - Grey for no changes.
3. **Stock Code and Name**: Use dark blue or grey for consistency and clarity.

This approach helps users quickly identify which stocks are performing well, which are underperforming, and which are stable, thereby enhancing the overall usability of the Stocks System.

Question 2 (Present your answers using PowerPoint slides)

(a) Find any 5 artefacts *(e.g. signboard, signage, announcement on noticeboard, etc)* in your campus. Take picture of the artefacts and insert them into PPT slides. Analyse the color(s) used and based on what you have learned in HCI, comment whether the color(s) used is good or poor. Give reasons to support

your answer.

Just gbt fake answer, see whether teacher ask or not

1. Signboard: "Library Opening Hours"
    a. Color(s) Used: Blue background with white text.
    b. Analysis:
        i. Good: High contrast, making text easily readable. Blue is calming and professional.
    c. Reason: Ensures that information is clear and legible from a distance.
2. Classroom Noticeboard: "Emergency Procedures"
    a. Color(s) Used: Red background with white text.
    b. Analysis:
        i. Good: Red grabs attention and is often used for urgent information. White text provides high contrast.
    c. Reason: Effective for emergency information, ensuring it stands out and is quickly noticed.
3. Campus Map
    a. Color(s) Used: Light gray background with dark blue and green markers.
    b. Analysis:
        i. Good: Light background reduces glare, while dark colors ensure markers are visible. Blue and green are distinguishable for different landmarks.
    c. Reason: Provides clear, accessible information without causing visual fatigue.
4. Event Poster: "Student Fair"
    a. Color(s) Used: Bright yellow with black text.
    b. Analysis:
        i. Good: Yellow is eye-catching and vibrant, while black text contrasts well.
    c. Reason: Attracts attention and conveys excitement, making the event stand out.
5. Cafeteria Menu
    a. Color(s) Used: White background with dark green and orange text.
    b. Analysis:
        i. Good: High contrast between text and background. Green and orange are vibrant but not overwhelming.
    c. Reason: Easy to read and visually engaging, helping users quickly find menu items.

Overall Comments:

Good Color Choices: Ensure high contrast, readability, and relevance to the context (e.g., emergency, events).
Poor Color Choices: Can lead to low visibility or confusion if colors blend with backgrounds or are hard to distinguish.

(b) Explain what *closure* means.

- A closure allows a function to remember the variables from its environment.
- It "closes over" the variables in its scope.

(c) *"Closure requires feedback".* Do you agree with the above statement? Explain your answer by using <u>one</u> suitable example (*own example*). In addition, discuss the consequences where there is little or no feedback provided.

Yes.

A closure is useful because it retains and uses information from its enclosing scope, **allowing** the **inner function to "remember"** and act on that information.

Example:
If a function creates a counter that keeps track of how many times it has been called, the inner function needs to access and modify the counter variable each time it's called. This interaction (feedback) is crucial for the counter to correctly increment and provide meaningful results.

Consequences of Little or No Feedback:
Without feedback, closures would **lack dynamic behavior**, as they would not **utilize or adapt to changes** in their outer environment. This would make them less effective for tasks that require maintaining or updating state over time.

Question 3 *(Present your answers using PowerPoint slides)*

According to Nielsen (2001), good error messages are *Explicit, Human Readable, Polite, Precise* and *Constructive.*

(a) Give 2 examples (own examples) of error messages that conform to some or all of above characteristics. State the source of your answers.

Example 1:

Message: "Please enter a valid email address. It should include '@' and a domain (e.g., example.com)."
Characteristics: Explicit (provides specific requirements), Human Readable (clear language), Constructive (guides user on how to fix the error).
Source: Adapted from Nielsen, J. (2001). Usability Engineering.

Example 2:
Message: "Your password must be at least 8 characters long and include both letters and numbers."
Characteristics: Explicit (details requirements), Polite (instructive without blaming), Constructive (helps users create a correct password).
Source: Adapted from Nielsen, J. (2001). Usability Engineering.

(b) Differentiate between a mistake and a slip. Give an example (own example) of each. Suggest how both (mistake and slip) can be avoided.

Mistake: A fundamental error in understanding or planning, often due to incorrect knowledge or decision-making.
Example: Entering the wrong country code in a form because you selected the wrong country from the dropdown menu, assuming it's correct.
Avoidance: Improve user training and provide clear instructions or context to ensure correct decisions.

Slip: A minor error in execution or action, often due to carelessness or a lapse in attention.
Example: Typing "pssword" instead of "password" because you missed a key.
Avoidance: Use real-time feedback, such as spell-check or confirmation prompts, to catch and correct errors immediately.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

Question 4 - Discuss one important factor that a designer should take into account when designing error messages for games.

Question 5 - Describe the characteristics of good error messages.

Question 6 - Call to action in web design — and in user experience (UX) in particular — is a term used for elements in a web page that solicit an action from the user. The most popular manifestation of call to action in web interfaces comes in the form of clickable buttons that when clicked, perform an action (e.g. "Buy this now!") or lead to a web page with additional information (e.g. "Learn more...") that asks the user to take action. Discuss some of the techniques to draw users' attention and lead them to call to action.

Question 7 *(present your answer using PowerPoint slides)*

Colour if used appropriately can make an interface pleasant and enjoyable to look at. Common applications of colour includes:

- highlight differences between information
- draw attention
- indicate status

Give 2 examples for each of the above. You may search the Internet or your Windows OS to find the required examples. Comment on the color used.

Tutorial 7: Input and Output Devices

Question 1

(a) Explain the following keyboard layouts:

- QWERTY
- DVORAK

1. QWERTY Keyboard Layout

Description:

The QWERTY layout is the **most common keyboard arrangement**, named after the first six letters in the top letter row. It was designed by Christopher Latham Sholes and patented in 1878 for typewriters. The layout was intended to reduce the likelihood of mechanical jams in early typewriters by spacing out commonly used letter combinations.

Advantages:

- **Widespread Usage:** It's the standard layout, so most people are familiar with it, making it easy to find and use.
- **Compatibility:** Almost all devices and software default to the QWERTY layout.
- **Learning Resources:** Abundant typing courses, tools, and resources are available for learning QWERTY.

Disadvantages:

- **Ergonomics:** The layout isn't optimized for typing efficiency or ergonomics, leading to more finger movement and potential strain.
- **Outdated Design:** The original purpose of avoiding typewriter jams is no longer relevant, but the layout persists, potentially slowing typing speed.

2. Dvorak Keyboard Layout

Description:

The Dvorak Simplified Keyboard, developed by Dr. August Dvorak in the 1930s, was designed to increase typing efficiency and reduce finger movement. The layout places the most commonly used letters on the home row, where fingers naturally rest, to improve typing speed and reduce fatigue.

Advantages:

- **Increased Efficiency:** Studies have shown that Dvorak can lead to faster typing speeds and less finger movement compared to QWERTY.

- **Ergonomics:** The layout is designed to reduce finger strain, potentially lowering the risk of repetitive strain injuries (RSIs).
- **Balance:** The design evenly distributes typing work between both hands, making it more comfortable.

Disadvantages:

- **Learning Curve:** Switching from QWERTY to Dvorak requires significant effort and time, as it's a very different layout.
- **Limited Availability:** Not all keyboards or devices come with Dvorak as a built-in option, requiring customization.
- **Compatibility Issues:** Some software and shortcuts are designed with QWERTY in mind, which might lead to conflicts or inefficiencies when using Dvorak.

(b) *Computer keyboard* layout followed *typewriter keyboard* layout. Why?

The computer keyboard layout followed the typewriter layout (QWERTY) because it was already **widely used and familiar**, making the transition to computers easier for users.

(c) Describe 2 situations in which *keyboard* might be preferred over *speech* for data entry/issuing command. Briefly explain your answer.

Noisy Environments: In **loud settings** like factories or open offices, typing on a keyboard is preferred because **speech recognition can struggle** to accurately interpret commands amidst background noise, while keyboards remain reliable and unaffected by ambient sounds.

Privacy Concerns: When **entering sensitive information**, such as passwords or personal data, typing on a keyboard is preferred because it avoids the risk of others overhearing or recording spoken commands, which could compromise security and privacy.

Question 2

(a) Describe 2 situations in which *speech* might be preferred over *keyboard* for data entry/issuing command. Briefly explain your answer.

Hands-Free Tasks: In situations where users need to keep their hands free, such as while cooking or driving, speech commands allow them to interact with their devices without physically typing, making it more convenient and

safer.

Accessibility Needs: For individuals with physical disabilities or conditions that make typing difficult, speech recognition provides an alternative that allows them to interact with computers and issue commands without needing to use a keyboard.

(b) Explain why thermal printer is a better choice for ATM machines.

Reliability and Speed: Thermal printers are fast and reliable, producing clear, high-quality prints without the need for ink or toner. This ensures quick transaction receipts and minimizes maintenance issues, which is crucial for ATM functionality and customer satisfaction.

Low Maintenance: Thermal printers use heat-sensitive paper, eliminating the need for ink cartridges or ribbons. This reduces the need for frequent replacements and maintenance, which is ideal for ATMs that require consistent and hassle-free operation.

Question 3 (Present your answers using PowerPoint slides)

(a)"If a fill-in form have both text entry fields and multiple-choice selection fields then each input type should be grouped together."

Do you agree with the above statement? Give reasons and an example (own example) to support your answer.

No, form should be separate to different section because affaird for conflict.

Yes, grouping similar input types together improves clarity and organization. It helps users focus on one type of input at a time, reducing errors and making the form easier to navigate. However, make sure that there is no conflict.

Example: In a job application form, place text fields (like Full Name and Address) in one section and multiple-choice fields (like Desired Position and Employment Type) in another. This makes it easier for users to complete the form efficiently.

(b) Watch https://www.youtube.com/watch?v=jbV5dGvJWyo

Based on the video, list some of the common sense things that you should do to avoid neck, shoulder, arm and leg pains as well as eyestrains when using a computer. In other words, give advice on how to avoid health problems when using a computer.

Adjust Your Chair and Desk Height: Ensure your chair and desk are at the right height so that your feet are flat on the floor, and your elbows are at a 90-degree angle while typing.

Use an Ergonomic Chair: Choose a chair that supports your lower back and encourages good posture to prevent back and shoulder pain.

Position Your Monitor Properly: Place the monitor at eye level and about an arm's length away to avoid straining your neck and eyes.

Take Regular Breaks: Follow the 20-20-20 rule: every 20 minutes, look at something 20 feet away for at least 20 seconds to reduce eyestrain.

Maintain Good Posture: Sit up straight with your shoulders relaxed and feet flat on the floor. Avoid slouching or leaning forward.

Use Proper Input Devices: Position your keyboard and mouse at a comfortable height and distance to avoid straining your arms and wrists.

Adjust Lighting: Ensure proper lighting to reduce glare on the screen and minimize eyestrain.

Stretch and Move: Regularly stretch and move around to prevent stiffness and reduce muscle fatigue.

(c) Find a similar video in youtube and share it with everyone in the class.

Video title: _____

https://youtu.be/riD8Xt8r1MQ?si=afELjCRK0PtDGgh4

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

A PC usually equipped with a QWERTY keyboard, a mouse and a VDU. Would these be satisfactory interactional devices? What other input and/or output devices might be needed and why? (You may use a scenario or make an assumption to support your answer)

Discuss the types of input and output devices that you would use for the following system. For each system, indicate why the conventional keyboard, mouse and computer screen may be less suitable. (You should do some research to answer this question).

(a) Global Positioning System (GPS)

(b) Automated Teller Machine (ATM)

(c) Tourist information system

Tutorial 8: Menus & Fill-in Form

Question 1

A common form of interaction is through the use of menus. Discuss this form of interaction in terms of:

(a) General advantages and disadvantages of menus (give 2 advantages and 2 disadvantages of menus)

Advantages:
Ease of Use: Menus simplify navigation by grouping related options together. Users can easily find and select items without needing to remember commands or use complex input methods.

Example: In a word processor, a "File" menu with options like "Open," "Save," and "Print" allows users to access these functions quickly and intuitively.

Organized Layout: Menus help in organizing functionality in a structured manner, reducing clutter and making the interface more manageable.

Example: In a photo editing application, a "Tools" menu that categorizes options like "Brush," "Eraser," and "Lasso" keeps the interface clean and focused.

Disadvantages:
Overloading: Long or complex menus can become overwhelming and difficult to navigate, especially if too many items are included.

Example: A web design tool with a single, lengthy menu containing every possible feature can make it hard for users to find what they need quickly.

Hierarchical Complexity: Deeply nested menus can make it challenging for users to find options, leading to frustration and longer task completion times.

Example: A settings menu with multiple layers of sub-menus for "Network Settings," "Advanced Network Settings," and then "Firewall Configuration" can be cumbersome to navigate.

(b) List all the ways of ordering/organising menu items. For each way give an example (own example) to support your answer.

Alphabetical Order:

Example: A file manager's "Sort By" option that lists files and folders alphabetically, making it easier to find items by name.

Categorical Grouping:
Example: A video editor's menu with categories like "File," "Edit," "View," and "Help" to group related functions together.

Frequency of Use:
Example: In a web browser, frequently used options like "New Tab" and "History" might be placed at the top of the menu for quicker access.

Task-Based Grouping:
Example: A music player with menus like "Play," "Pause," "Stop," and "Volume Control" grouped under a "Playback" menu.

Contextual Order:
Example: In a photo editing app, tools and options might change based on the selected tool or object, presenting relevant menu items only when needed.

(c) Do some research to find out other possible ways/choices of ordering menu items. List out those ways/choices not covered in the lecture. Explain your answer.

User-Defined Order:
Explanation: Allowing users to customize the order of menu items based on their preferences or usage patterns.
Example: Some email clients let users reorder toolbar buttons or menu items according to their needs.

Recent or Recently Used Items:
Explanation: Placing recently used items or functions at the top of the menu for quicker access.
Example: In a document editor, recently opened files are listed under a "Recent Documents" menu.

Logical Flow:
Explanation: Organizing menu items in a logical sequence that mirrors the typical workflow or usage pattern.
Example: In a task management app, menus might be ordered from "Create Task" to "Assign Task" to "Track Progress," reflecting the typical task lifecycle.

Priority of task

Question 2 (Present your answers using PowerPoint slides)

(a) Linda is a new programmer working with you in a software development company. She requested assistance from you to give her some advice on how to design an effective form. Write 5 design guidelines for fill-in form that you think might help her. Explain your answer.

Keep It Simple: Limit fields to only what's necessary to avoid overwhelming users.

Use Clear Labels: Make labels easy to understand and descriptive of what's needed.

Group Related Fields: Organize fields into logical sections for easier navigation.

Provide Immediate Feedback: Show errors or validation messages as users type to help them correct mistakes quickly.

Ensure Accessibility: Design the form to be usable by everyone, including those with disabilities, using proper contrast and keyboard navigation.

(b) Find a fill-in form (onscreen or paper fill-in form) which you think is well designed and another one which you think is poorly designed. Share with the class both forms during tutorial. Explain your answer.

Well-Designed Form: Shopee Checkout Form
Reasons:

- **Simple Layout**: The form is streamlined with only essential fields like shipping address, payment method, and order summary.
- **Clear Labels**: Each field has a straightforward label, such as "Shipping Address" and "Payment Method," making it easy for users to understand what information is needed.
- **Logical Grouping**: Information is organized into clear sections: "Shipping Information," "Payment Information," and "Order Summary," which helps users navigate the form efficiently.
- **Immediate Feedback**: The form provides real-time validation and feedback, such as highlighting incomplete or incorrect fields and offering corrections.
- **Accessible Design**: The form is designed to be user-friendly, with good contrast and easy navigation, and is compatible with screen readers.

Poorly Designed Form: JobStreet Job Application Form

Reasons:

1. **Overly Complex**: The form includes a large number of fields, some of which may be redundant or not immediately relevant, causing user fatigue.
2. **Unclear Labels**: Some field labels are vague or overly technical, such as "Provide details of your employment history" without clear guidance on what information is required.
3. **Disorganized Layout**: Fields are not grouped logically, making it challenging for users to navigate and complete the form efficiently.
4. **Lack of Feedback**: The form lacks real-time validation and does not provide immediate feedback on errors, which can lead to user frustration.
5. **Accessibility Issues**: The form might not be optimized for users with disabilities, such as lacking keyboard navigation support or not being screen reader friendly.

Question 3

Based on what you have learned in HCI, design a new *examination attendance slip* to replace the existing one. The examination attendance slip must contain the following fields:

Seat no, Index no (in words), Index no (in figures), Paper examined (as printed on the exam paper), Date of examination, Time of examination, Signature.

Show how it would appear on paper and briefly explain the rationale of your design.

Examination Attendance Slip

Field	Input/Description
Seat No.:	
Index No. (in words):	
Index No. (in figures):	
Paper Examined:	
Date of Examination:	
Time of Examination:	
Signature:	

Rationale:

1. **Label Clarity**: Each field is labeled with a clear, descriptive title to ensure that students can easily understand what information is required.
2. **Organized Layout**: The fields are aligned in a tabular format, making it easy to follow and fill in. This reduces cognitive load, following the HCI principle of simplicity.
3. **Separation of Index Information**: By separating the Index number in words and figures, it minimizes errors in filling out the form and makes verification easier.
4. **Adequate Space**: Sufficient space is provided for each input field, especially for the signature area, ensuring that the user can comfortably fill in the required information.
5. **Consistency**: All fields are consistently aligned and formatted, creating a structured and professional appearance. This consistency helps users know where to focus and makes the process of filling out the form more intuitive.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

"Mobile devices required different menu design"

Comment on the above statement. Discuss some of the interaction styles and highlight some design considerations of menu design on mobile devices.

Tutorial 9: Questionnaires

Question 1

(a) In the context of HCI, explain the meaning of evaluation. Give 3 reasons why it is important to evaluate systems.

- Evaluation is about assessing the usability of a system.
- Evaluation is used to evaluate interfaces and systems for determining how usable they are for different user groups.
- Evaluation identifies good and bad features to inform future design.
- Evaluation compares design choices to assist us in making decisions.
- Evaluation observes effects of specific interfaces on users.

(b) What are the methods that a designer can use to evaluate the usability of a product/system/software?

- Expert analysis
- User participation

Question 2

(a) In HCI, questionnaires have long been used to evaluate user interfaces. Discuss 2 advantages and 2 disadvantages of using questionnaires as a technique of evaluation.

- Advantages
  - Quick and reaches large user group
  - Can be analyzed more systematic
- Disadvantages
  - Less flexible
  - Less probing
  - Require skill to produce a good questionnaire
  - Poor returned rates

(b) One of the issues of using questionnaires is poor returned rates. Suggest 2 solutions to overcome this problem.

- Closed questions should be asked instead of open questions. Closed questions provide a range of possible answers. So, the users can easily

choose one or more answers from the provided range. They are not required to always keep thinking about the answers and write it in full sentences.

- Questions should be structured carefully. The questionnaire should start with general or easy questions, then followed by more detailed or difficult questions. Thus, users will not feel stressed and they can gradually adapt to the questions scenario when answering more and more questions.

Question 3

(a) Analyse the questionnaire given below and then redesign the questionnaire to improve it. You must show at least 4 improvements in your answer. Give reasons for your answer. *(Note: Do NOT change the last question i.e. let it be an open question)*

PLEASE STATE YOUR AGE IN YEARS: .....

HOW LONG HAVE YOU USED THE INTERNET? (PLEASE CHECK ONE ONLY)
- ☐ < 1 YEAR
- ☐ 1-3 YEARS
- ☐ 3-6 YEARS
- ☐ > 6 YEARS

DO YOU USE THE INTERNET TO:

- SEND-EMAIL ☐
- FIND INFORMATION ☐
- PURCHASE GOODS ☐
- VISIT CHATROOMS ☐
- READ NEWS ☐

HOW USEFUL IS THE INTERNET TO YOU?

_____

Age Input Method:

- The age input is an open-ended field, which could lead to inconsistent responses (e.g., "20", "twenty", "21.5").
- **Improvement**: Use a drop-down list or radio buttons for specific age ranges (e.g., "Under 18", "18-24", "25-34", etc.). This makes it easier to categorize and analyze the data.

Internet Usage Duration:

- The options provided are mutually exclusive, but using checkboxes can confuse respondents, leading them to select multiple options.
- **Improvement**: Replace checkboxes with radio buttons to ensure that only one option can be selected, which is more appropriate for mutually

exclusive choices.

Internet Activities:

- The "Do you use the Internet to" section could be unclear about whether respondents should select all that apply or just one.
- **Improvement**: Clearly instruct the respondent to "Select all that apply" if multiple answers are allowed. Alternatively, use a Likert scale to gauge the frequency of each activity.

General Formatting and Clarity:

- The layout of the questionnaire could be more structured, and the instructions could be clearer to avoid misinterpretation.
- **Improvement**: Add a brief instruction at the top (e.g., "Please answer the following questions about your internet usage.") and space out each section for better readability.

Redesigned Questionnaire

---

1. Please state your age: (select one)

- ☐ Under 18
- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55 and above

2. How long have you used the internet? (select one)

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 3-6 years
- ☐ More than 6 years

3. How often do you use the internet for the following activities? *(Please rate each item on a scale of 1 to 5, where 1 = Never and 5 = Very Often)*

- Send Email: [1] [2] [3] [4] [5]
- Find Information: [1] [2] [3] [4] [5]
- Purchase Goods: [1] [2] [3] [4] [5]
- Visit Chatrooms: [1] [2] [3] [4] [5]
- Read News: [1] [2] [3] [4] [5]

4. How useful is the internet to you? *(Open-ended response)*

(b) Suggest a cost effective way to evaluate the usability of the Google Classroom. Justify your answer. Include also in your answer the steps to be followed to carry out the evaluation.

Method: Remote User Testing

Why?

- **Low Cost**: No need for physical locations—use online tools like Zoom or Google Meet.
- **Broader Reach**: Access a diverse range of participants from different locations.
- **Convenient**: Participants can join from anywhere, making scheduling easier.

Steps to Follow

1. **Set Goals**:
    - Identify key tasks users do in Google Classroom (e.g., submitting assignments).
    - Decide what to measure (e.g., how long tasks take, user satisfaction).
2. **Find Participants**:
    - Target a mix of users (teachers, students).
    - Recruit online and offer small incentives.
3. **Prepare Tasks**:
    - Create tasks based on common classroom activities (e.g., "Submit an assignment").
    - Make sure instructions are clear.
4. **Set Up Remote Testing**:
    - Use Zoom or similar tools for screen sharing and recording.
    - Test the setup beforehand.
5. **Conduct Testing**:
    - Have participants perform tasks while talking through their process.
    - Observe and take notes on any issues they face.
6. **Analyze Results**:
    - Review recordings to spot usability problems and gather feedback.
    - Summarize findings and identify key issues.
7. **Report & Improve**:
    - Share the results with stakeholders.
    - Suggest improvements and, if possible, test again after changes.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

List the guidelines for designing questionnaire.

Tutorial 10: Expert Reviews and Observing Users

Question 1

Experts (UI/HCI Specialists) can be involved in the design of user interfaces.

(a) Explain how they can help developers to produce better user interfaces.

- Expert reviews:
  - Experts can quickly and inexpensively identify potential usability issues without needing a lab or user involvement. They assess whether the system adheres to accepted usability principles.
- Cognitive Walkthrough:
  - This method involves experts simulating the user's experience to evaluate how easy the system is to learn. They identify severe usability problems and suggest new features.
- Heuristic Evaluation:
  - Experts use established usability principles to independently critique the system. This helps in identifying common usability problems easily in the design process.
- Think Aloud Technique:
  - Experts verbalize their thoughts while performing tasks on the system, providing insights into usability issues and user experience.

(b) Evaluate the advantages and disadvantages of involving experts?

- Advantages:
  - Cost-effective; Expert reviews are fast and inexpensive as they don't require a well equipped lab or user involvement.
  - Early detection: Experts can identify potential usability issues at any stage of development, from design specifications to full implementations.
  - Brod insight: Experts can provide valuable insights based on their extensive knowledge and experience in usability principles.
- Disadvantages:
  - Lack of real user data: Expert evaluations do not assess actual use of the system, only its adherence to usability principles.
  - Potential bias: Experts might overlook issues that real users would encounter, as they are not the target audience.
  - Limited perspective: The evaluation might miss specific user needs

and preferences that only actual users can provide.

Question 2

Many large software development companies have usability laboratories to test their software.

(a) Discuss the pros and cons of testing software in a usability laboratory.

- Pros:
  - Controlled environment: Ensures consistent conditions, reducing external variables that might affect the results.
  - Advanced equipment: Access to specialized tools and technology for detailed analysis, such as eye-tracking and screen recording.
  - Expert supervision: Facilitates immediate feedback and guidance from usability experts.
- Cons:
  - Artificial setting: May not accurately reflect real-world usage, leading to results that don't fully represent user behavior in natural environments.
  - Costly and time-consuming: Setting up and maintaining a usability lab can be expensive and requires significant time investment.
  - Limited user diversity: Often involves a smaller, less diverse group of users, which might not capture the full range of potential user experiences.

(b) How many tester(s) is/are needed for the first test and subsequent tests. Give reason for each of your answers.

- First test (heuristic evaluation):
  - 3 – 5 experts are recommended. This number is sufficient to identify most usability issues without being redundant. Multiple evaluators ensure a comprehensive review, as different experts may sport different problems.
- Subsequent tests (cognitive walkthrough):
  - 1 – 2 experts are enough. The focus is on detailed task analysis from the user's perspective. Fewer experts can provide a thorough walkthrough, especially if they are familiar with the system and its users.

Question 3

(a) Compare and contrast between *field studies* and *usability testing in a usability laboratory.*

- *Environment:*
  - *Field Studies: Conducted in the user's natural environment, providing real-world context.*
  - *Laboratory Testing: Conducted in a controlled environment, often with specialized equipment.*
- *User Interaction:*
  - *Field Studies: Users interact with the system as they normally would in their daily lives.*
  - *Laboratory Testing: Users perform specific tasks under observation, often with predefined scenarios.*

(b) For field studies, what do you think are the right things to do in order to minimise the

Hawthorne/Observer Effect?

- Blend In: Ensure observers are as unobtrusive as possible to avoid influencing participants' behavior.
- Longitudinal Studies: Conduct observations over a longer period so participants become accustomed to the presence of observers.
- Use Technology: Employ unobtrusive recording devices to minimize direct human observation.
- Anonymous Participation: Ensure participants' anonymity to reduce their awareness of being observed.

(c) Fill-in the empty cells for the table below:

Evaluation and testing	Techniques
(1) with users involvement	Think Aloud, Query, Experimental
(2) without users involvement	Cognitive Walkthrough, Heuristic Evaluation

Tutorial 11: Usability Measurements, Ergonomics ,H+S

Question 1 (Present your answers using PowerPoint slides)

(a) Explain how usability measurements can be beneficial to both developers and customers.

(b) What are the ways of measuring software usability?

(c) Suggest suitable way(s) to measure the usability of your HCI assignment's prototype. Justify your choice(s).

Question 2 (Present your answers using PowerPoint slides)

(a) What are the benefits of making the working environment ergonomically correct?

(b) Describe the negative impact to workers as a result of a poorly designed working environment while at the same time they have to use a computer over a long period of time.

(c) Using your favourite browser search for "Google Office". Create about 10-20 slides to illustrate the working environments in Google.Com. Include also some photos of working environments in 3 other companies for comparison purposes (one of them must be own your place of study). Explain your answer.

Question 3 (Present your answers using PowerPoint slides)

(a) The followings are important factors that need to be taken into account in order to create an ideal/wholesome working environment.

- Proper desks and chairs
- Adequate lighting
- Low noise level
- Temperature (15°C to 22°C)

Give reason(s) why each of the above factor is important to the office workers.

(b) Give one example (own example) of an incorrect sitting posture. Explain your answer.

(c) Give one example (own example) of a correct sitting posture. Explain your answer.

Note: For Q3(b) and Q3(c), search the Internet/textbook for the required answers.

Additional questions (on your own, i.e. questions below will not be discussed during tutorial)

Question 1

(a) Do you agree that the introduction of computers can cause some of the followings?

- Stress and anxiety - Fear of unemployment - Loss of responsibility - Inadequacy - Lack of privacy - Alienation

- System failures - Deterioration of self image

(b) Discuss how the above problems can be mitigated. Question 2

What is RSI and why is it an increasing problem for the computer users? Question 3

You have been requested to produce a leaflet to show what a good typing posture looks like. Sketch a first version of this leaflet with textual explanation indicating what a good posture should looks like

- End -