Process Components of UX
UX Design Lifecycle: A cycle of the life of a UX design, from inception to deployment and beyond.
UX Lifecycle Activities: (1) Understand Needs of users. (2) Design Solutions. (3) Prototype Candidates (for promising designs). (3) Evaluate UX.
The Wheel: Each rotation closer to destination. Blueprint for process to any design; applies if design scope small piece (chunk) or the whole system.
Lifecycle Subactivities: (1) Data elicitation, (2) Data analysis, (3) Data modeling, (4) Requirements Extraction
UX Methods: A way one can carry out the whole or part of a given lifecycle activity or subactivity, for example, Usage Research
UX Techniques: Use to perform a step within an activity, subactivity, or method, for example, User Interviews, Observation of users at work

(1) Understand Needs | Method: Usage Research | Sub-Activity: Elicit usage information | Method: Observe and Interview | Technique: Manual note-taking
(2) Design Solution | Generative design: Ideation, sketching, low-fi, criquiqing | Conceptual Design: Mental, system models, storyboards, lo-fi | Intermediate design: Ecological, interaction, emotional design for promising candidates, illustrated scenarios, wireframes, trade offs, medium-fidelity
(3) Prototype Candidates | Paper prototypes, wireframes, wireflows, click-through wireframe prototypes, physical prototypes
(4) Evaluate UX | Collect evaluation data | Analyse evaluation data | Propose redesign solutions | Report results

Contextual Inquiry: Usage Research Data Elicitation / Understand user word and needs
Data Eliviation STEPS: (1) Field visit (observe, interview, log, gather artefacts, sketches, diagrams) (2) Identify people, things, processes, information, constraints, inputs, outputs. (3) Model information using descriptions, document main use cases, create different stories, create formal diagrams
BEFORE the visit: Learn culture, vocab, slang of subject domain, learn company goals, competitors, proposed system, decide data sources and visit logistics/parameters

Generative Design: Ideation informers: task description, personas, user work roles, flow models, activity based interaction, task structure, sequence model, artifact models, social models, requirements | Ideation catalysts: source of inspiration from observing world around you | Ideation techniques (brainstorming, framing, reframing, magic wand, reuse successful solutions, seek opportunities for embodies, tangible interactions)
Design Thinking: Inductive: Observation Pattern → hypothesis -> theory | Deductive: theory → hypothesis → observation → confirmation

Design Walkthrough: informal reactions | scenarios, storyboards, sketches, wireframes | Exploration on behalf of users through experts eye, user-centric | Early feedback, anticipate problem | communication |Flexibility and Scalability | Key functionalities and common tasks | Open discussion with stakeholders
Design Review: More comprehensive | click-through wireframe workflow, navigation | Leader-driven | Explain what user does, thinks and how the task fits in the work practice, workflow, and context
Persona: Help designers focus on the needs and goals of specific types of users, creating a more tailored and effective learning experience | narrative description of a specific design target in ONE work role | hypothetical but specific “character” | mbodies a story and description of a realistic individual | NOT an actual user | Derived from user research | Defined by user goals | consistent model | Makes user "real" | Difficult for diverse | too many bad |Risk of incorporating unsupported designer assumptions

Heuristic Evaluation: 50% hit-rate | May prejudice study design | Can be stand-alone OR follow scenarios
Visibility: Users shouldn't guess | Appropriate feedback timely, control, transparency, trust | Something in shopping cart, logged in, assignment uploaded
Match: Vocabulary, real-word conventions, workflow match (required information, copying paper to screen, interruptions Is "Edit Mode" a button?
User Control and Freedom | Undo/Redo | Clearly Marked exit
Consistency & Standards | Follow platform conventions, constant terminology
Recognition / Recall | Minimise memory load | Option vs type it in
Flexibility | Acc accelerators for expert users
Aesthetic: Remove irrelevant or rarely needed information
Help Recognise: Error messages and suggest solutions | "Are you sure you want to exit?"

Fitts Law: Performance measure for time to complete the task of pointing at an object | Depends on width and distance to move pointer
Hick-Hyman: time to make decision as result of n possible choices |"That's the object I want!"| log2 if menu is sorted logically (alphabetically, Days of week, Manager, Senior, Junior), or if brain can predict what's next, otherwise Linear

Memory: Sensory memories + Attention → Short-term + Rehearsal → Long-term | Iconic: Visual, Echoic: Aural, Haptic: tactile stimuli
STM: Rapid access, duration 30s, Limited capacity (7 +/- chunks) | Experience moves recognition to recall, Recognition can become barrier
Retroactive interference: New information replaces old | Proactive interference: old may interfere with new
LTM: Slower access, slow decay, unlimited capacity | Episodic: serial memory of events, Semantic : Structured memory of facts, concepts, skills
semantic LTM derived from episodic LTM
Reading Text Calculation: 60 sec/min)(0.23 sec/saccade)(5 saccade/word) = 52 words/min
Matching Symbol Calculation: Presented with 2 symbols once. User presses a YES key if they match | Tp + 2tC + TM = 100 + 2*70 + 70 = 310[130-640] msec
Cycle Times and Task Performance: sum of cycle time 100 + 70 + 70 = 240 msec, Maximum number of corrections will be about 20 (5000/240)

Gestalt: Our visual system has evolved to perceive objects
Proximity: Objects close will be seen as belonging together | whitespace can communicate your intended logical grouping of a screen the user
Similarity: Objects with similar visual characteristics will be seen as a group and therefore related
Common Fate: Objects that move together are seen as related
Continuity: Lines that are continuous with disruption (grass, leaves in the way) we complete even though its visually not there | "I imagine how it continues or flows."
Closure: See things as complete objects even though gaps might exist |"I see the whole thing, even if parts are missing."
Area: Objects with smalls area seen as figure not the ground | If you make something big enough, it becomes the background and isn't meant to hold your attention
Symmetry: Symmetrical figures tend to be seen as complete and as groups
Surroundedness: An area that is surrounded will be seen as the figure and the area that surrounds will be seen as the ground
Prägnanz: We tend to perceive things based on the simplest and most stable or complete interpretation | Olympic rings, face made out of numbers, complex shapes

Monochromatic: One hue | **Analogous**: Hues near each other | **Complementary**: Hues opposite to each other

Lo-Fi Adv: Lower cost | Evaluated multiple design concepts | Useful communication | Addresses screen layout issues | Useful identify market requirements | Proof of concept
Lo-Fi Dis: Limited error checking | Poor detail spec tp code | Facilitator Driver | Limited utility after requirements established | Limited usefulness testing | Nav and flow limit
Hi-Fi Adv: Complete functionality | fully interactive | User-driven | clearly defines nav scheme | exploration and test |Serves as living specification | marketing and sales tool
Hi-Fi Dis: More resource intensive | time consulting |inefficient for proof-of-concept | not effective for requirements gathering

Inclusive Design: Universal: Broaden concept, design for everyone | Accessible: Attribute focused on disability | Assistive: Specific tools for disability (walking stick)
Universal (Everyone can use / Everyone can get through the door) → Usable (Everyone can use easily / The door handle is easy to grasp) → Inclusive (Gender, Culture, Religion, Lang / Door dimensions fits diverse people) → Accessable (Vision, hearing, physical, cognition / Door is automatic) → Assistic Tools (glasses, hearing aid, wheelchair / Long reach door opener)
Permanent: One arm, Bline, Deaf, Non-Verbal
Temporary: Arm injury, Cataract, Ear Infection, Laryngitis
Situational: New parent, Distracted driver, bartender, heavy accent

Inclusive Design: Recognize exclusion, as this helps us generate new ideas for inclusivity, Aim to first solve for one target audience, then extend it to many
Contextual Inquiry for Inclusion: Interviews, Focus Groups, Surveys, only difference is you work with marginalised groups
(1)Understand stakeholder difficulties, do they need safe space? assistants present? (2) Let them choose how they wish to express themselves (draw, story tell, speaking)

Web Font Size: The general consensus for font size is 16px as a frequent recommendation, using standard settings (established frameworks).
Color Contrast: A contrast ratio of at least 4.5:1 for normal sized text is recommended. (21:1, 19.55:1)
Larger Text Size: If text < 18pt or <14pt (bold), then use a 4.5:1 contrast ratio. If text >=18pt or >14pt (bold), then use a 3:1 contrast ratio.
Functional Color: Colors can transmit information (traffic light colors), and should be used alongside other information (don't use functional color just by itself)
Texture aids: Make information of different types clear to people, for example for color blindness, patterns/texture can be an additional differentiator.
Navigation: Give people ways to navigate through information we provide, such as menus, headings, subheadings, etc especially for screen-readers
Keyboard: Some users with mobility impairments rely on keyboard assistive technologies, so ensure everything is keyboard accessible (ordering, presenting information, visual indications of current element in focus etc)
Page Title: Good titles that adequate and briefly describe the content of the page
Form Fields: Add names to fields so users know what goes into these fields.
Visual Clues: Provide alternative information for screen-reader users. Incorrect passwords shouldn't just have a red outline, it should also describe the mistake
ALT Text: Identifies elements for people who cannot see it, such as broken links, or people with visual impairments
Audio Content: For deaf users, provide another channel of information such as audio transcripts and closed captioning on content that relies on sound
Skip Navigation: Allows mouse-less users to move keyboard focus to different areas of a web page without forcing them to press the tab key repeatedly

Quantitative Data: Expressed as numbers | **Quantitative analysis**: Numerical methods to ascertain size, magnitude and amount | Numerical, like speed, error rate, distance
Provides measurable evidence (numbers). Expressed as numbers Numerical methods to ascertain size, magnitude and amount
Qualitative Data: Difficult to measure as numbers, though counting words are possible | **Qualitative analysis**: Expresses nature of elements through themes, patterns, stories
Interviews, Focus Groups, Case Study, Ethnography (observational studies) | **Grounded Theory & Content Analysis**
Rich descriptions, motivations, "the story.". Expressed as themes and excerpts Expresses the nature of elements through themes, patterns and stories

Grounded: Derives theory from systematic analysis of empirical data based on a categorization approach
STAGE 1: Open Coding: Read text and analyze to identify patterns, opinions, Not based on established theory; be open to all possibilities! (in vivo coding)
STAGE 2: Development of Concepts | Codes that describe similar content are grouped together to form higher-level concepts
STAGE 3: Grouping of Concepts | Further grouping to form categories based on axial coding. Axial coding: breaking down data into categories to reveal deeper insight
STAGE 4: Formation of Theory | Correlation between concepts. Selective coding: identify core category. Sounds linear, but complex and contextual. Iterative review is key
"I find myself checking Slack every few minutes, even when I'm trying to focus. It totally ruins my flow." → Distraction from notifications → Distractions
"If I don't set a proper routine in the morning, I just drift through the day and don't get much done." → Lack of structure = low productivity → Energy levels

Content: Classifying data into themes or categories based on frequencies (both qualitative and quantitative)
"I didn't feel motivated without in-person classes." → Lack of engagement → Lack of engagement: 25 mentions

Emergent coding: qualitative analysis without prior theory, noting concepts and refining them into a model.
A priori coding: Using an established theory to guide the selection of coding categories.
Axial Coding: Identifying and defining the relationships between the concepts and categories developed from the initial codes.

Cohen's Kappa: Two coders independently coded interview data from 50 children. They agreed on 30 of the responses. The probability of agreement by chance is 0.4.
P0 = 30/50 = 0.6 (observed agreement)
Pe = 0.4 (the given chance of agreement)
Therefore, K = (0.6 - 0.4) / (1 - 0.4) = 0.2/0.6 = 0.33

Quantitative Data Use
Benchmarking: Comparing against goals, previous versions, or competitors. | Tracking: Monitoring performance/experience over time.| Comparing Designs: Rigorously evaluating different solutions. | Validating: Providing numerical support for observations.| Data-Driven Decisions: Making informed choices based on evidence.
Measuring what users do (Objective Performance): Task completion time, Counting User Errors, Count number of tasks completed within a certain period, success rates
Asking users what they think or feel (Subjective Perceptions via Questionnaires): Labels, Anchors, Points, Granularity
Bias in measurement Instruments; A broken ruler
Bias in Experimental Procedures; Instruction wording difference: "Hurry up" vs "Take your time"; participants might worry about speed rather than depth
Bias in Participants: Giving a questionnaire to your grandmother vs a computer science student
Bias in Experimenter Behaviour: Giving a questionnaire to your friend
Bias in Experimental Environment: Loud noisy, uncomfortable temperatures, poor lighting, someone watching over you
Sensory: I see the button | **Cognitive**: I understand what button does | **Physical**: The button easy to click | **Functional**: The button does what its meant to do
Ethics Importance: design decisions can significantly impact people's rights and well-being
Dark Pattern: A deceptive user interface that manipulates users into actions they didn't intend
*For example, for a ID question where D = 8 and W = 1, you will have to do log(2*8/1) / log(2). Step by steps in the calculator would be 2*8/1 -> = -> log -> / -> 2 -> log -> =*
a = 0.278, b = 0.197, D = 11, T < 1, w = ?
*w = 2D / 2^[(T-a)/b] ---> 2*11 / 2^[(1-0.278)/0.197] = 1.73442445*
This width result is only when T = 1 though, and we want T < 1. The question also asks for only 1 digit after the decimal. So we increase the width to 1.8 (as an increase in width decreases the time taken to attain target), where now T < 1, which you can check if you insert 1.8 as the width back into the equation.