

Exercise_2

STACK (LIFO - Last In, First Out)

Q1 - MTN MoMo Navigation: Pressing "back" removes whatever you just entered. Latest entry is first to go - perfect LIFO!

Q2 - UR Canvas Back Button: Like removing the top card from a pile to see what's underneath. Classic stack behavior.

Q3 - BK Banking Undo: Each action creates a "memory card" on top of a pile. Undo grabs the top card, reverses the action, tosses the card.

Q4 - Irembo Form Validation: Open section → add to pile. Close section → remove from pile. Empty pile at end = perfect match!

Q5 - Task Tracking: Operations: Push("CBE notes") → Push("Math revision") → Push("Debate") → Pop() → Push("Group assignment") Answer: "Group assignment" is on top

Q6 - ICT Exam Undos: 3 undos = remove top 3 items. What remains? The 4th, 5th, 6th items from the original top.

Q7 - RwandAir Booking: Each step creates a checkpoint. Back button is your time machine to the previous checkpoint.

Q8 - Proverb Reversal: Stack words: Umwana (bottom) → ni → umutware (top) Pull off: umutware → ni → Umwana Result: "umutware ni Umwana"

Q9 - Library Search: Stack keeps you focused on one path until exhausted, then backtracks. Queue would explore everything superficially first.

Q10 - Transaction Navigation: Breadcrumb system where each drill-down level gets remembered. Users can jump back multiple levels instantly.

QUEUE (FIFO - First In, First Out)

Q1 - Restaurant Service: First person who arrived gets served first. Natural fairness = FIFO in action.

Q2 - YouTube Playlist: Video finishes and "leaves" the front, next video steps up automatically.

Q3 - RRA Tax Payment: People arrive → join back of line. Tax office serves whoever waited longest. Queue 101!

Q4 - Telecom Service Centers: Queues eliminate chaos. Everyone knows their place, staff focus on helping instead of managing disputes.

Q5 - Bank Queue: Alice joins → Eric joins → Chantal joins → Alice served (leaves) → Jean joins
Answer: Eric is now first in line

Q6 - RSSB Fairness: Process by submission order regardless of connections or money.
Transparency in action.

Q7 - Rwandan Examples:

Wedding buffet: Straight line, serve and leave

Nyabugogo buses: Loop route efficiently, use every spot

Bus boarding: Enter from front or back door as needed

Q8 - Restaurant Kitchen: Two queues: Order queue (kitchen cooks in sequence) + Ready queue (meals wait for pickup).

Q9 - Hospital Emergency: Heart attack jumps ahead of minor cut. Medical urgency creates priority levels, not normal FIFO.

Q10 - Taxi Matching: Driver queue (fair ride assignments) matches with student request queue (fair processing). Both get served fairly.