NAMES: BIZIMUNGU James

GROUP 1

REG Nº 224016991

BIT YEAR 2

MODULE: DATA STRUCTURE AND ALGORITHMS

LECTURE: RUKUNDO Prence

Stack Questions

1. MoMo pushes Dial Code, Enter PIN, Select Service. Undo last two. Which remains?

After pushing all, the stack is: `Dial Code, Enter PIN, Select Service`
Undo (pop) twice removes Select Service and Enter PIN.
Remaining: `Dial Code`

2. UR student pushes Assignment, Revision, Group Work. Pop once. What is on top?

After push: `Assignment, Revision, Group Work`
Pop once (removes Group Work).
Top of stack: `Revision`

3. Reverse the list Banana, Apple, Mango using stack

Push each onto stack, then pop all:
Reversed: `Mango, Apple, Banana`

4. Reflection: Why does stack represent last action first undone?

A stack uses LIFO (Last-In First-Out). The most recent action (top) is always undone first—like undoing your last step in a drawing app, or removing the last plate you stacked.

Queue Questions

1. RSSB: 5 pension applicants join, serve 2, who is next?

Queue: `A1, A2, A3, A4, A5` (joined in order)

Serve 2: Remove A1 and A2.

Next to be served: `A3`

2. CHUK hospital: 4 patients enqueue, after 1 served, who remains?

Queue: `P1, P2, P3, P4`

Serve 1: Remove P1.

Remaining: `P2, P3, P4`

3. Circular queue for 3 moto taxis

A circular queue lets 3 motos take turns in a cycle: when one leaves, its spot is reused, so the queue never grows beyond 3 and is always ready for the next round.

4. Reflection: Why does FIFO model fairness in healthcare?

FIFO (First-In First-Out) ensures the first patient to arrive is the first to be served. This prevents skipping or favoritism, modeling fairness and reducing waiting injustice