STACK AND QUEUE QUESTIONS

A.STACK QUESTIONS

Q1. Practical (Rwanda): UR pushes ["AssignmentX", "AssignmentY", "AssignmentZ"]. Undo one. Which is top?

Stack operations:

Push "AssignmentX" → Stack: ["AssignmentX"]

Push "AssignmentY" → Stack: ["AssignmentX", "AssignmentY"]

Push "AssignmentZ" → Stack: ["AssignmentX", "AssignmentY", "AssignmentZ"]

Undo one (pop) → Stack: ["AssignmentX", "AssignmentY"]

Top of stack:

"AssignmentY"

Q2. Practical (Rwanda): In Irembo, push ["StepX", "StepY", "StepZ"]. Undo all. Which remains?

Stack operations:

Push "StepX" → Stack: ["StepX"]

Push "StepY" → Stack: ["StepX", "StepY"]

Push "StepZ" → Stack: ["StepX", "StepY", "StepZ"]

Undo all (pop three times):

Pop → ["StepX", "StepY"]

Pop → ["StepX"]

Pop → []

Stack after all undos:

Nothing remains (stack is empty).

Q3. Challenge: Push ["A", "B", "C"], pop all, push "D". Which is top?

Stack operations:

Push "A" → ["A"]

Push "B" → ["A", "B"]

Push "C" → ["A", "B", "C"]

Pop all (three times) → []

Push "D" → ["D"]

Top of stack:

"D"

Q4. Reflection: Why stack is best for reversing input order?

Reason:

A stack works on the Last-In-First-Out (LIFO) principle, meaning the last item pushed is the first one popped. When you push a sequence of items and then pop them all, you retrieve them in reverse order. This makes stacks ideal for reversing sequences, such as characters in a string or steps in a process.

B. QUEUE QUESTIONS

1. Practical (Rwanda): At CHUK, 10 patients queue. After 7 served, who is front?

Explanation:

A queue is First-In-First-Out (FIFO). After serving 7 patients, the 8th patient (who arrived 8th) is now at the front.

Front of queue:

Patient number 8

2. Practical (Rwanda): At Nyabugogo, 8 buses queue. Who departs first?

Explanation:

In a queue, the first to arrive is first to depart.

First to depart:

Bus number one (1) is the first bus to arrive

3. Challenge: Queue vs stack for distributing voter cards. Which is correct?

>Distributing cards should be done in the order people arrived (FIFO), so a queue is correct.

A stack would give cards to the last person who arrived first (not fair).

Correct data structure: is queue

4. Reflection: Why FIFO promotes trust in elections?

FIFO promotes trust in elections becouse everyone is served in the order they arrived, ensuring fairness and transparency. People trust the process because no one can skip ahead, reducing complaints and suspicion.