📓 Assignment: Stack and Queue in Real Life (Rwanda Context

Part I: STACK

1. Practical (MoMo)

Push steps: ["Dial", "PIN", "Confirm"]

Undo 2 means popping the last two → remove "Confirm" and "PIN".

Remaining: ["Dial"]

Explanation: Stack works on LIFO (Last In, First Out). The last actions are undone first.

2. Practical (UR Lectures)

Push lectures: ["LectureA", "LectureB", "LectureC"]

Pop all → stack becomes empty.

Remaining: []

Explanation: If we remove everything, the stack is empty.

3. Challenge (Reverse Word)

Word: "QUEUEORDER"

Push each letter, then pop one by one.

Reversed: "REDROEUEUQ"

Explanation: A stack reverses items because the last pushed comes out first.

4. Reflection

A stack cannot replace queues in services because:

Stack = LIFO → last person would always be served first.

Services require fairness → first person in line should be served first.

Therefore, queues are more suitable.

Python Code (Stack)

```
# Stack Examples

# MoMo steps
stack = ["Dial", "PIN", "Confirm"]
stack.pop()  # Undo 1
stack.pop()  # Undo 2
print("MoMo after undo 2:", stack)
```

```
# UR lectures
lectures = ["LectureA", "LectureB", "LectureC"]
for _ in range(len(lectures)):
    lectures.pop()
print("UR after popping all:", lectures)

# Reverse QUEUEORDER
word = "QUEUEORDER"
stack = list(word)
reversed_word = ""
while stack:
    reversed_word += stack.pop()
print("Reversed word:", reversed_word)
```

Part II: QUEUE

1. Practical (RRA citizens)

Initial queue: [1,2,3,4,5,6,7,8,9,10]

After 6 served → [7,8,9,10]

Front: 7

Explanation: Queue works on FIFO (First In, First Out). The first six leave first.

2. Practical (BK ATM)

Queue: [1,2,3,4,5]

Second person: 2

Explanation: Queues keep strict order.

3. Challenge (Fairness)

Stack: unfair, because last person gets ID first.

Queue: fair, because IDs are given in arrival order.

Answer: Queue is fair.

4. Reflection

FIFO ensures equality in civic services because:

First-come, first-served → no skipping.

Promotes order, discipline, fairness.

Citizens trust the system when order is respected.

Python Code (Queue)

```
from collections import deque

# RRA queue (10 citizens)
queue = deque(range(1, 11))
for _ in range(6):  # 6 served
    queue.popleft()
```

```
print("RRA front citizen after 6 served:", queue[0])

# BK ATM (5 clients)
queue = deque(range(1, 6))
print("Second in ATM queue:", queue[1])
```

🎯 **Conclusion**

Stack = LIFO → good for undo, reversing, history.

Queue = FIFO → good for fairness, lines, and services.

Real life in Rwanda shows both:

MoMo (stack behavior for undo).

RRA/ATM (queue behavior for fairness).