DATA STRUCTURE AND ALGORITHM

ASSIGNMENT 3 CHALLENGES

ALGORITHM

Challenge on Stack:

Show stack trace for ["X", "Y", "Z", "W"] with 2 pops as algorithm.

Step1: Initialize an empty stack and this sets up the LIFO structure

stack=[]

Step 2: Push X onto the stack. Now Top ix X

stack.append("X")

Step 3: Push Y onto the stack. Now top is Y

stack.append("Y") #

Step 4: Push Z onto the stack,Now top is Z

stack.append("Z")

Step 5: Push W onto the stack, Now top is W

stack.append(“W”)

Step 6: Pop once. This removes W, then top becomes Z

Stack.pop()

Step 7: Pop again, Removes Z , top becomes Y

Stack.pop()

Step 8: Print stack, it will print(X,Y) the remaining elements and top is Y

Step 9: End

Challenge on queue:

Queue vs stack for food delivery orders. Which is right? As algorithm

1. **Initialize an empty queue. This sets up the FIFO structure for orders.**
   Stack=[]
2. **Push First order (Order 1). It becomes front**
   queue.append(“Order1”)
3. Push second order (Order 2). Order 1 remains Front
   queue.append(“Order2”)
4. Push third Order() . Order 1 still front
   queue.append(“Order3”)
5. Pop first order to serve, Removes Order1 , order 2 becomes front

   Queue.pop(0)

6. Pop again, Removes order 2, order 3 becomes front
   Queue.pop(0)
7. Print queue and remaining is ORDER 3.
   Print(queue)
8. End

For stack (incorrect): Using LIFO would serve the latest order first, leading to older orders being delayed, which is unfair and inefficient for delivery where timeliness matters based on arrival.

Queue is right because it preserves the order of arrival, ensuring first-placed orders are delivered first.