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1 //Saket M Kharche
2 // Stack implementation using a linked list
3 class StackLinkedList {
4     // Node class represents each element in the linked list
5     private class Node {
6         int data; // Data to be stored in the node
7         Node next; // Reference to the next node in the list
8
9         // Constructor to initialize the node
10        public Node(int data) {
11            this.data = data;
12            this.next = null; // Initially, the next node is null
13        }
14    }
15
16    private Node top; // The top node in the stack
17
18    // Constructor to initialize the stack
19    public StackLinkedList() {
20        top = null; // Initially, the stack is empty
21    }
22
23    // Check if the stack is empty
24    public boolean isEmpty() {
25        return top == null; // Stack is empty if top is null
26    }
27
28    // Push an element onto the stack
29    public void push(int value) {
30        Node newNode = new Node(value); // Create a new node with the given value
31        newNode.next = top; // Point the new node's next to the current top node
32        top = newNode; // Update the top to be the new node
33        System.out.println("Pushed " + value + " to the stack.");
34    }
35
36    // Pop an element from the stack
37    public int pop() {
38        if (isEmpty()) { // If the stack is empty, return -1 indicating failure
39            System.out.println("Stack is empty! Cannot pop.");
40            return -1;
41        } else {
42            int value = top.data; // Get the data of the top node
43            top = top.next; // Move the top pointer to the next node
44            return value; // Return the popped value
45        }
46    }
47
48    // Peek at the top element of the stack without removing it
49    public int peek() {
50        if (isEmpty()) { // If the stack is empty, return -1
51            System.out.println("Stack is empty! Cannot peek.");
52            return -1;
53        } else {
54            return top.data; // Return the data of the top node
55        }
56    }
57 }
58
59 public class MainLinkedList {
60     public static void main(String[] args) {
61         StackLinkedList stack = new StackLinkedList(); // Create a new stack using a linked list
62
63         stack.push(10);
64         stack.push(20);
65         stack.push(30);
66         stack.push(40);
67         stack.push(50);
68
69         System.out.println("Top element is: " + stack.peek()); // Peek at the top element
70
71         System.out.println("Popped element: " + stack.pop()); // Pop the top element
72         System.out.println("Popped element: " + stack.pop()); // Pop another element
73     }
74 }
75
```