

// Question 2 : Write a program to create a singly linked list and do the following

// i. Find the average of middle 2 elements

// ii. Delete last node

// iii. Given 2 positions, swap the values at the positions

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```
import java.io.*;
```

```
public class LabB2 {
```

```
    public static void main(String[] args) throws IOException {
```

```
        BufferedReader br = new BufferedReader(new
```

```
InputStreamReader(System.in));
```

```
        int choice;
```

```
        LinklistFunctions lf = new LinklistFunctions();
```

```
        do {
```

```
            System.out.println("\nLinked List Manager");
```

```
            System.out.println("1.Add Data to Linked List.");
```

```
            System.out.println("2.Display Data in the Linked List.");
```

```
            System.out.println("3.Average of Middle Elements.");
```

```
            System.out.println("4.Delete last node.");
```

```
            System.out.println("5.Swap values.");
```

```
            System.out.println("6.Exit.");
```

```
            System.out.println("Enter your choice.");
```

```
            choice = Integer.parseInt(br.readLine());
```

```
            switch (choice) {
```

```
            case 1:
```

```
                System.out.println("Enter data to be inserted.");
```

```
                int data = Integer.parseInt(br.readLine());
```

```
                lf.push(data);
```

```
                lf.displayLinkedList();
```

```
                break;
```

```
            case 2:
```

```
                lf.displayLinkedList();
```

```
                break;
```

```
            case 3:
```

```
                lf.averageOfMiddle();
```

```
                break;
```

```
            case 4:
```

```
                lf.deleteLastNode();
```

```
                lf.displayLinkedList();
```

```
                break;
```

```
            case 5:
```

```
                System.out.println("Enter 2 position to be swapped.");
```

```
                String line = br.readLine();
```

```
                String[] str = line.trim().split(" ");
```

```
                int p1 = Integer.parseInt(str[0]);
```

```
                int p2 = Integer.parseInt(str[1]);
```

```
                if (p1 == p2)
```

```
                    System.out.println("Swap not possible, same position
```

```
specified.");
```

```
                else
```

```
                    lf.swap(p1, p2);
```

```
                lf.displayLinkedList();
```

```

        break;
    case 6:
        System.out.println("Have a great day!");
        break;
    default:
        System.out.println("Wrong option selected. ");
    }
} while (choice != 6);
}
}

```

```

class Link {
    private int data;
    public Link next;

    public Link(int d) {
        data = d;
    }

    public int returnData() {
        return data;
    }

    public void setData(int d) {
        data = d;
    }
}

```

```

class LinklistFunctions {
    private Link first;

    public LinklistFunctions() {
        first = null;
    }

    public boolean isEmpty() {
        return first == null;
    }

    // Insert data to the last of the linked list
    public Link push(int data) {
        Link li = null;
        Link new_link = new Link(data);
        new_link.next = null;
        if (first == null) {
            first = new_link;
        } else {
            Link last = first;
            while (last.next != null) {
                last = last.next;
            }
            last.next = new_link;
        }
        return li;
    }
}

```

```

}

// Display the LinkedList
public void displayLinkedList() {
    System.out.println("\nDisplaying Linked List");
    Link current = first;
    while (current != null) {
        System.out.print(current.returnData() + " ");
        current = current.next;
    }
    System.out.println(" ");
}

public int linkedListLength() { // Finds the length of the list.
    int count = 0;
    Link current = first;
    while (current != null) {
        count += 1;
        current = current.next;
    }
    return count;
}

public void averageOfMiddle() { // Finds the average of the middle elements
    Link current = first;
    int n = linkedListLength();
    if (n == 1) {
        System.out.println("Average = " + (current.returnData())/2);
    }
    else if (n % 2 == 0) {
        for (int i = 0; i < (n / 2) - 1; i++) {
            current = current.next;
        }
        int b = current.returnData();
        current = current.next;
        int c = current.returnData();
        System.out.println("Average of 2 middle elements = " + ((b + c) /
2));
    }
    else {
        for (int i = 1; i <= (n / 2); i++) {
            current = current.next;
        }
        int v = current.returnData();
        System.out.println("Average of the middle element = " + v / 2);
    }
}

}

public Link deleteLastNode() { // Delete the last node from linked list
    if (first == null)
        return null;
    if (first.next == null) {
        return null;
    }
}

```

```

        Link prev = first;
        while (prev.next.next != null)
            prev = prev.next;
        prev.next = null;
        return first;
    }

    public void swap(int pos1, int pos2) { // pos1 < pos2
        Link ithlink = first;
        Link jthlink = first;
        for (int link = 0; link < pos1-1; link++) {
            ithlink = ithlink.next;
        }
        for (int link = 0; link < pos2-1; link++) {
            jthlink = jthlink.next;
        }
        int temp = ithlink.returnData();
        ithlink.setData(jthlink.returnData());
        jthlink.setData(temp);
    }
}

```