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import java.util.Scanner;

// Class to Represent a Node
class Node
{
    int info;
    Node next;
}

// Class to Represent the Singly Linked List
public class SinglyLinkedList
{

    public static Node head=null;

    // Create a Singly Linked List
    public static void create()
    {
        Scanner sc=new Scanner (System.in);
        Node p=new Node();
        System.out.print("Input info ");
        p.info=sc.nextInt();
        p.next=null;
        head=p;

        //Adding Remaining Nodes (if any)
        System.out.println("Do you want more nodes(y/n)");
        char ch=sc.next().charAt(0);
        while(ch!='n')
        {
            Node q=new Node();
            System.out.print("Input info ");
            p.info=sc.nextInt();
            q.next=null;
            p.next=q;
            p=q;
            System.out.println("Do you want more nodes(y/n)");
            ch=sc.next().charAt(0);
        }

        // Display the Content of the Singly Linked List
        public static void display()
        {
            Node temp = head;

            while(temp!=null)

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        {
            System.out.print(temp.info+"--->");
            temp=temp.next;
        }
        System.out.print("null \n");
    }

    //Count the no. of nodes in the Singly Linked List
    public static int count()
    {
        int count=0;
        Node temp=head;
        while(temp!=null)
        {
            count = count + 1;
            temp=temp.next;
        }
        return count;
    }

    //Search a Particular Element of the Singly Linked List
    public static int search(int x)
    {
        int pos=0;
        Node temp=head;
        while(temp!=null)
        {
            pos++;
            if(temp.info==x)
                return pos;
            temp=temp.next;
        }
        return -1;
    }

    // Insert at the Beginning of the Singly Linked List
    public static void insert_beg()
    {
        Scanner sc=new Scanner (System.in);
        Node p=new Node();
        System.out.print("Input info ");
        p.info=sc.nextInt();
        p.next=head;
        head=p;
    }

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// Insert at the End of the Singly Linked List
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public static void insert_end()
{
    Scanner sc=new Scanner (System.in);
    Node p=new Node();
    System.out.print("Input info ");
    p.info=sc.nextInt();
    if(head==null)
    {
        head=p;
    }
    else
    {
        Node temp=head;
        while(temp.next!=null)
        {
            temp=temp.next;
        }
        temp.next=p;
    }
}
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// Insert at a Particular Position of the Singly Linked
List
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public static void insert_pos(int pos)
{
    Scanner sc=new Scanner (System.in);
    int c=count();
    if(pos>=1&&pos<=c+1)
    {
        if(pos==1)
        {
            insert_beg();
        }
        else if(pos==c+1)
        {
            insert_end();
        }
        else
        {
            Node p=new Node();
            System.out.print("Input info ");
            p.info=sc.nextInt();
            Node temp=head;
            int cnt=1;
            while(cnt<pos-1)
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        {
            cnt++;
            temp=temp.next;
        }
        p.next=temp.next;
        temp.next=p;
    }
}
else
{
    System.out.println("Invalid Position");
}
}

// Delete at the Beginning of the Singly Linked List
public static void delete_beg()
{
    if(head == null)
    {
        System.out.println("Underflow");
        return;
    }

    head=head.next;
}

// Delete at the End of the Singly Linked List
public static Node delete_end()
{
    Node temp=head;
    if(head==null)
    {
        System.out.println("Underflow");
        return null;
    }
    if(head.next==null)
    {
        head=null;

        return temp;
    }
    else
    {

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        while(temp.next.next!=null)
        {
            temp=temp.next;
        }
        temp.next=null;
    }
    return temp;
}

// Delete at a Particular Position of the Singly Linked
List
public static void delete_pos()
{
    if(head==null)
    {
        System.out.println("Underflow");
        return;
    }

    Scanner sc=new Scanner (System.in);
    System.out.println("Enter the position");
    int pos=sc.nextInt();
    int c=count();
    if(pos<=c)
    {
        if(pos==1)
        {
            delete_beg();
        }
        else if(pos==c)
        {
            delete_end();
        }
        else
        {
            Node temp=head;
            int cnt=1;
            while(cnt<pos-1)
            {
                cnt++;
                temp=temp.next;
            }
            temp.next=temp.next.next;
        }
    }
}

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    }
    else
    {
        System.out.println("Invalid Position");
    }
}

// Reverse the Singly Linked List
public static void reverse()
{
    Node pvs = null;
    Node cur = head;
    Node nxt = null;

    while (cur != null)
    {
        nxt = cur.next;
        cur.next = pvs;
        pvs = cur;
        cur = nxt;
    }
    head = pvs;
}

// Sort the Singly Linked List
public static void sort()
{
    Node cur = head, index = null;

    if (head == null) {
        return;
    }
    else {
        while (cur != null) {

            index = cur.next;

            while (index != null) {

                if (cur.info > index.info) {
                    swap(cur, index);
                }
            }
        }
    }
}

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        index = index.next;
    }
    cur = cur.next;
}
}

// Swap the information of two nodes
public static void swap(Node cur, Node in)
{
    int temp_r;
    temp_r = cur.info;
    cur.info = in.info;
    in.info = temp_r;
}

public static void main(String[] args) {
    Scanner sc = new Scanner (System.in);

    while(true)
    {
        System.out.println("****MENU****");
        System.out.println("0:Exit");
        System.out.println("1:Creation");
        System.out.println("2:Display");
        System.out.println("3:Count");
        System.out.println("4:Search");
        System.out.println("5:Insert");
        System.out.println("6>Delete");
        System.out.println("7:Reverse");
        System.out.println("8:Sort");
        System.out.println("*****");
        System.out.println("Enter the choice");
        int choice = sc.nextInt();
        switch(choice)
        {
            case 0:
                System.exit(0);
            case 1:
                create();
                break;
            case 2:
                display();
                break;
            case 3:

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        System.out.println("No. of Nodes =" + count());
        break;
    case 4:
        System.out.println("Enter info to be searched");
        int e = sc.nextInt();
        int pos = search(e);
        if (pos == -1)
            System.out.println("Searched info not
present");
        else
            System.out.println("Info present at position
" + pos);
        break;
    case 5:
        System.out.println("****INSERT****");
        System.out.println("1: Begning");
        System.out.println("2: End");
        System.out.println("3: Specific Position");
        System.out.println("Enter the choice");
        int ch = sc.nextInt();
        switch (ch)
        {
            case 1:
                insert_beg();
                break;
            case 2:
                insert_end();
                break;
            case 3:
                System.out.println("Enter the position");
                pos = sc.nextInt();
                insert_pos(pos);
                break;
            default:
                System.out.println("Wrong choice");
                break;
        }
        break;
    case 6:
        System.out.println("****DELETE****");
        System.out.println("1: Begning");
        System.out.println("2: End");
        System.out.println("3: Specific Position");
        System.out.println("Enter the choice");
        ch = sc.nextInt();
        switch (ch)
        {

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        case 1:
            delete_beg();
            break;
        case 2:
            Node t =delete_end();
            System.out.println(t.info);
            break;
        case 3:
            delete_pos();
            break;
        default:
            System.out.println("Wrong choice");
            break;
    }
    break;
case 7:
    reverse();
    break;
case 8:
    sort();
    break;
default:
    System.out.println("Wrong choice");
}
}
}
}

```