Assignment 12

**import** java.util.Scanner;

**public** **class** Main {

**static** **class** Node {

**int** data;

Node prev, next;

Node(**int** data) {

**this**.data = data;

}

}

**static** Node *head* = **null**;

**static** **void** addNode(**int** data) {

Node newNode = **new** Node(data);

**if** (*head* == **null**) {

*head* = newNode;

**return**;

}

Node temp = *head*;

**while** (temp.next != **null**)

temp = temp.next;

temp.next = newNode;

newNode.prev = temp;

}

**static** **void** insertAtBeginning(**int** data) {

Node newNode = **new** Node(data);

**if** (*head* != **null**) {

newNode.next = *head*;

*head*.prev = newNode;

}

*head* = newNode;

}

**static** **void** insertAtEnd(**int** data) {

*addNode*(data);

}

**static** **void** insertAtThird(**int** data) {

Node newNode = **new** Node(data);

Node temp = *head*;

**for** (**int** i = 1; i < 2 && temp != **null**; i++)

temp = temp.next;

**if** (temp == **null** || temp.next == **null**) **return**;

newNode.next = temp.next;

newNode.prev = temp;

temp.next.prev = newNode;

temp.next = newNode;

}

**static** **void** deleteFirst() {

**if** (*head* != **null**) {

*head* = *head*.next;

**if** (*head* != **null**)

*head*.prev = **null**;

}

}

**static** **void** deleteLast() {

**if** (*head* == **null** || *head*.next == **null**) {

*head* = **null**;

**return**;

}

Node temp = *head*;

**while** (temp.next != **null**)

temp = temp.next;

temp.prev.next = **null**;

}

**static** **void** deleteThird() {

Node temp = *head*;

**for** (**int** i = 1; i < 2 && temp != **null**; i++)

temp = temp.next;

**if** (temp != **null** && temp.next != **null**) {

Node del = temp.next;

temp.next = del.next;

**if** (del.next != **null**)

del.next.prev = temp;

}

}

**static** **void** displayForward() {

Node temp = *head*;

System.***out***.print("List: ");

**while** (temp != **null**) {

System.***out***.print(temp.data + " ");

temp = temp.next;

}

System.***out***.println();

}

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.print("Enter number of nodes: ");

**int** n = sc.nextInt();

System.***out***.println("Enter values:");

**for** (**int** i = 0; i < n; i++) {

*addNode*(sc.nextInt());

}

*displayForward*();

System.***out***.print("Insert at beginning: ");

*insertAtBeginning*(sc.nextInt());

*displayForward*();

System.***out***.print("Insert at end: ");

*insertAtEnd*(sc.nextInt());

*displayForward*();

System.***out***.print("Insert at 3rd position: ");

*insertAtThird*(sc.nextInt());

*displayForward*();

System.***out***.println("Delete first node.");

*deleteFirst*();

*displayForward*();

System.***out***.println("Delete last node.");

*deleteLast*();

*displayForward*();

System.***out***.println("Delete 3rd node.");

*deleteThird*();

*displayForward*();

sc.close();

}

}

Ouput:

Enter number of nodes: 5

Enter values:

3

2

5

6

1

List: 3 2 5 6 1

Insert at beginning: 3

List: 3 3 2 5 6 1

Insert at end: 5

List: 3 3 2 5 6 1 5

Insert at 3rd position: 1

List: 3 3 1 2 5 6 1 5

Delete first node.

List: 3 1 2 5 6 1 5

Delete last node.

List: 3 1 2 5 6 1

Delete 3rd node.

List: 3 1 5 6 1