Assignment 9

**Question 1**

package project;

public class MyArrayList {

// store the elements in an array

private double[] elements;

private int current;

public String toString() {

String string = "[";

for (int n = 0; n < elements.length; n ++) {

if (n == elements.length - 1) {

string = string + elements[n] + "]";

}

else {

string = string + elements[n] + ", ";

}

}

return string;

}

public MyArrayList(int initialCapacity) {

this.elements = new double[initialCapacity];

this.current = 0;

}

public void delete(int n) {

if (n > elements.length) {

System.out.println("MyArrayList does not contain a " + n+ " element" );

}

else {

double[] temp = new double[elements.length-1];

for (int x = 0; x < n ; x++) {

temp[x] = elements[x];

}

for (int a = n; a<elements.length -1; a++){

temp[a] = elements [a+1];

}

this.elements = temp;

}

}

public boolean contains(double num) {

boolean check = false;

for (double n: elements) {

if (n == num) {

check = true;

}

}

return check;

}

public MyArrayList() {

this(4);

}

private void resizeIfNeedBe() {

if (this.elements.length == this.current) {

// resize the array by making it one bigger

double[] newElements = new double[this.elements.length \* 2];

// copy the elements into the newElements

for (int i = 0; i < this.elements.length; i++) {

newElements[i] = this.elements[i];

}

this.elements = newElements;

}

}

public void addFront(double x) {

resizeIfNeedBe();

for (int i = current; i != 0; i--) {

this.elements[i] = this.elements[i - 1];

}

this.elements[0] = x;

this.current++;

}

public void add(double x) {

resizeIfNeedBe();

this.elements[this.current] = x;

this.current++;

}

}

**Test Method:**

public static void main(String[] args) {

MyArrayList newList = new MyArrayList();

newList.add(2.0);

newList.add(4.0);

newList.add(6.0);

newList.add(8.0);

newList.add(10.0);

newList.add(12.0);

newList.add(14.0);

newList.add(16.0);

System.out.println(newList.toString());

newList.delete(2);

System.out.println(newList.toString());

newList.delete(41);

System.out.println(newList.toString());

newList.delete(1);

System.out.println(newList.toString());

System.out.println(newList.contains(2.0));

System.out.println(newList.contains(3.0));

System.out.println(newList.contains(3));

}

**Output:**

[2.0, 4.0, 6.0, 8.0, 10.0, 12.0, 14.0, 16.0]

[2.0, 4.0, 8.0, 10.0, 12.0, 14.0, 16.0]

MyArrayList does not contain a 41 element

[2.0, 4.0, 8.0, 10.0, 12.0, 14.0, 16.0]

[2.0, 8.0, 10.0, 12.0, 14.0, 16.0]

true

false

false

**Question 2**

package project;

public class MyLinkedList {

private ListNode head;

public MyLinkedList() {

this.head = null;

}

public void delete(int i) {

ListNode current = head;

for (int j = 0; j < i - 1; j++) {

current = current.next;

if (current.next == null) {

System.out.println("Will Terminate: There is no element " + i);

}

}

if (current.next.next == null || current.next == null) {

System.out.println("Will Terminate: There is no element " + i);

}

current.next = current.next.next;

}

public String toString() {

String string = "[";

ListNode pointer = head;

while (pointer.next != null) {

string = string + pointer.value + ", ";

pointer = pointer.next;

}

string = string + pointer.value + "]";

return string;

}

public boolean contains(double num) {

boolean check = false;

ListNode pointer = head;

while (pointer.next != null) {

if (pointer.value == num) {

check = true;

}

if (pointer.value == num) {

check = true;

}

pointer = pointer.next;

}

return check;

}

public void add(double x) {

if (this.head == null) {

ListNode node = new ListNode(x);

this.head = node;

} else {

// finds the last node in the chain of nodes

ListNode current = head;

while (current.next != null) {

current = current.next;

}

// adds a new node at the end of the chain

ListNode node = new ListNode(x);

current.next = node;

}

}

}

**Test Method:**

public static void main(String[] args) {

MyLinkedList list = new MyLinkedList();

list.add(1.0);

list.add(2.0);

list.add(3.0);

list.add(4.0);

list.add(5.0);

list.add(6.0);

System.out.println(list.toString());

list.delete(2);

System.out.println(list.toString());

list.delete(3);

System.out.println(list.toString());

System.out.println(list.contains(1.0));

System.out.println(list.contains(52.0));

list.delete(4);

}

**Output:**

[1.0, 2.0, 3.0, 4.0, 5.0, 6.0]

[1.0, 2.0, 4.0, 5.0, 6.0]

[1.0, 2.0, 4.0, 6.0]

true

false

Will Terminate: There is no element 4

Exception in thread "main" java.lang.NullPointerException

at project.MyLinkedList.delete(MyLinkedList.java:18)

at project.Ass9.main(Ass9.java:44)