

# Rajalakshmi Engineering College

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 9\_MCQ

Attempt : 1  
Total Mark : 15  
Marks Obtained : 13

#### Section 1 : MCQ

1. How can you access the first element of an ArrayList named as list?

**Answer**

list.get(0);

**Status : Correct**

**Marks : 1/1**

2. What will be the output of the following code?

```
import java.util.*;  
class Main {  
    public static void main(String[] args) {  
        ArrayList<String> list = new ArrayList<>();  
        list.add("apple");  
        list.add("banana");  
    }  
}
```

```
list.add("cherry");
list.add("banana");
System.out.println(list.lastIndexOf("banana"));
}
}
```

**Answer**

4

**Status : Wrong**

**Marks : 0/1**

3. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.add(5);
        System.out.println(list.get(3));
    }
}
```

**Answer**

4

**Status : Correct**

**Marks : 1/1**

4. What will be the output of the following code?

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Stack<Integer> stack = new Stack<>();
        for (int i = 1; i <= 3; i++)
            stack.push(i * 2);
    }
}
```

```
        stack.pop();
        stack.push(10);
        System.out.println(stack.peek());
    }
}
```

**Answer**

10

**Status :** Correct

**Marks :** 1/1

5. Which method is used to add an element to the top of the stack?

**Answer**

push()

**Status :** Correct

**Marks :** 1/1

6. What will be the output of the following code?

```
import java.util.ArrayList;
```

```
public class Main {
    public static void main(String[] args) {
        ArrayList<String> list = new ArrayList<>();
        list.add("Apple");
        list.add("Banana");
        list.remove("Apple");
        System.out.println(list);
    }
}
```

**Answer**

[Banana]

**Status :** Correct

**Marks :** 1/1

7. Which of the following methods removes and returns the last element from a LinkedList?

**Answer**

removeLast()

**Status :** Correct

**Marks :** 1/1

8. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(10);
        list.add(20);
        list.add(30);
        list.remove(1);
        System.out.println(list);
    }
}
```

**Answer**

[10, 30]

**Status :** Correct

**Marks :** 1/1

9. What will be the output of the following code?

```
import java.util.*;
public class Main {
    public static void main(String[] args) {
        Stack<Integer> s = new Stack<>();
        s.push(10);
        s.push(20);
        s.push(30);
        System.out.println(s.peek());
    }
}
```

```
}
```

**Answer**

30

**Status :** Correct

**Marks :** 1/1

10. What will be the output of the following code?

```
import java.util.*;
class Main {
    public static void main(String[] args) {
        ArrayList<Integer> list = new ArrayList<>();
        list.add(1);
        list.add(2);
        list.add(3);
        list.add(4);
        list.set(2, 10);
        System.out.println(list);
    }
}
```

**Answer**

[1, 10, 3, 4]

**Status :** Wrong

**Marks :** 0/1

11. What is Collection in Java?

**Answer**

A group of objects

**Status :** Correct

**Marks :** 1/1

12. What will be the output of the following code?

```
import java.util.ArrayList;
```

```
public class Main {  
    public static void main(String[] args) {  
        ArrayList<Integer> list = new ArrayList<>();  
        list.add(10);  
        list.add(20);  
        list.add(30);  
        System.out.println("Size of the list: " + list.size());  
    }  
}
```

**Answer**

Size of the list: 3

**Status :** Correct

**Marks :** 1/1

13. What will be the output of the following code?

```
import java.util.*;  
class Main {  
    public static void main(String[] args) {  
        ArrayList<String> list = new ArrayList<>();  
        list.add("Java");  
        list.add("Python");  
        list.add("Java");  
        list.add("C++");  
        System.out.println(list.indexOf("Java"));  
    }  
}
```

**Answer**

0

**Status :** Correct

**Marks :** 1/1

14. What is the correct way to create an ArrayList in Java?

**Answer**

`ArrayList<String> list = new ArrayList<>();`

**Status :** Correct

**Marks :** 1/1

15. What does the addFirst() method of LinkedList do?

**Answer**

Adds an element to the beginning of the list

**Status :** Correct

**Marks :** 1/1

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 9\_Q1

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Bobby is tasked with processing a sequence of numbers from a monitoring system. He needs to extract a strictly increasing subsequence using an ArrayList. The program should dynamically add numbers to the ArrayList only if they are greater than the last number currently stored in the list. Bobby aims to efficiently utilize the dynamic resizing and indexing features of the ArrayList to solve this problem.

Help Bobby implement this solution.

##### ***Input Format***

The first line of input consists of an integer N, representing the number of elements.



The second line consists of N space-separated integers, representing the elements.

### **Output Format**

The output prints the list of integers in increasing sequence, ignoring out-of-order elements.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 7

3 5 9 1 11 7 13

Output: [3, 5, 9, 11, 13]

### **Answer**

```
// You are using Java
```

```
// You are using Java
```

```
import java.util.ArrayList;
```

```
import java.util.Scanner;
```

```
public class Main {  
    public static void main(String[] args) {  
        Scanner sc = new Scanner(System.in);  
  
        int N = sc.nextInt();  
        int[] elements = new int[N];  
        for (int i = 0; i < N; i++) {  
            elements[i] = sc.nextInt();  
        }  
    }  
}
```

```
ArrayList<Integer> increasingList = new ArrayList<>();
```

```
    for (int num : elements) {  
        if (increasingList.isEmpty() || num >  
            increasingList.get(increasingList.size() - 1)) {  
            increasingList.add(num);  
        }  
    }  
}
```

```
System.out.println(increasingList);  
sc.close();  
}  
}
```

**Status :** Correct

**Marks : 10/10**

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 9\_Q2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Vikram loves listening to music and wants to create a simple playlist manager using Java Collections. The playlist supports the following operations:

"ADD <song>" Adds the song to the end of the playlist. "REMOVE <song>" Removes the first occurrence of the song from the playlist. If the song is not found, do nothing. "SHOW" Displays all songs in the playlist in order. If the playlist is empty, print "EMPTY". "NEXT" Moves to the next song in the playlist and prints its name. If the playlist is empty, print "EMPTY".

The playlist maintains a "current song" position that starts at the first song when it's added. The NEXT command moves to the next song and prints it, wrapping around to the first song after reaching the last song. When removing songs, the current position adjusts accordingly to maintain

proper navigation.

Help Vikram implement this playlist manager.

### ***Input Format***

The first line of the input consists of an integer n, the number of operations.

The next n lines, each containing a command:

- "ADD <song>"
- "REMOVE <song>"
- "SHOW"
- "NEXT"

### ***Output Format***

For each "SHOW" command, print the songs in order, separated by spaces.

For each "NEXT" command, print the next song in the playlist.

If no song exists, print "EMPTY".

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: 7

ADD song1

ADD song2

SHOW

NEXT

REMOVE song2

SHOW

NEXT

Output: song1 song2

song2

song1

song1

### ***Answer***

```
// You are using Java
import java.util.*;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();
        LinkedList<String> playlist = new LinkedList<>();
        int currentIndex = -1;
        for (int i = 0; i < n; i++) {
            String input = sc.nextLine();
            String[] parts = input.split(" ", 2);
            String command = parts[0];
            switch (command) {
                case "ADD":
                    String songToAdd = parts[1];
                    playlist.add(songToAdd);
                    if (playlist.size() == 1) {
                        currentIndex = 0;
                    }
                    break;
                case "REMOVE":
                    String songToRemove = parts[1];
                    int removeIndex = playlist.indexOf(songToRemove);
                    if (removeIndex != -1) {
                        playlist.remove(removeIndex);
                        if (playlist.isEmpty()) {
                            currentIndex = -1;
                        } else if (removeIndex < currentIndex) {
                            currentIndex--;
                        } else if (removeIndex == currentIndex) {
                            if (currentIndex >= playlist.size()) {
                                currentIndex = 0;
                            }
                        }
                    }
                    break;
                case "SHOW":
                    if (playlist.isEmpty()) {
                        System.out.print("EMPTY");
                    }
            }
        }
    }
}
```

```

    } else {
        for (int idx = 0; idx < playlist.size(); idx++) {
            System.out.print(playlist.get(idx));
            if (idx != playlist.size() - 1) System.out.print(" ");
        }
    }
    System.out.print("\n");
    break;
case "NEXT":
    if (playlist.isEmpty()) {
        System.out.print("EMPTY ");
    } else {
        currentIndex = (currentIndex + 1) % playlist.size();
        System.out.print(playlist.get(currentIndex) + " ");
    }
    break;
}
}
sc.close();
}
}

```

**Status :** Correct

**Marks :** 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### 2028\_REC\_OOPS using Java\_Week 9\_Q3

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Assist Pranitha in developing a program that takes an integer N as input, representing the number of names to be read. Then read N names and store them in an ArrayList. Finally, input a search string and output the frequency of that string in the list of names.

Note: Some parts of the code are provided as snippets, and you need to complete the remaining sections by writing the necessary code.

##### ***Input Format***

The first line of input consists of an integer N, representing the number of names to be read.

The following N lines consist of N names, as a string.

The last line consists of a string, representing the name to be searched.

### **Output Format**

The output prints a single integer, representing the frequency of the specified name in the given list.

If the specified name is not found, print 0.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

Alice

Bob

Ankit

Alice

Pranitha

Alice

Output: 2

### **Answer**

```
import java.util.*;

class NameFrequency {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int N = sc.nextInt();
        sc.nextLine();
        ArrayList<String> names = new ArrayList<>();
        for (int i = 0; i < N; i++) {
            names.add(sc.nextLine());
        }
        String searchName = sc.nextLine();
        int count = 0;
        for (String name : names) {
            if (name.equals(searchName)) {
                count++;
            }
        }
    }
}
```



```
}  
    System.out.println(count);  
}  
}
```

**Status :** Correct

**Marks :** 10/10

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 9\_PAH

Attempt : 1  
Total Mark : 30  
Marks Obtained : 30

#### Section 1 : Coding

##### 1. Problem Statement

Aditi is analyzing stock market trends and wants to find the Next Greater Element (NGE) for each stock price in a list. The Next Greater Element for an element  $x$  in an array is the first element to the right that is greater than  $x$ . If no greater element exists, return -1 for that position.

Your task is to help Aditi by efficiently computing the Next Greater Element for each element in the given array using a Stack.

Example:

Input:

6

4 5 2 10 8 6

Output:

5 10 10 -1 -1 -1

Explanation:

For each element:

4 5 (next greater element)5 102 1010 -1 (No greater element)8 -16 -1

### ***Input Format***

The first line contains an integer n, representing the number of elements.

The second line contains n space-separated integers arr[i], where arr[i] is the stock price on the i-th day.

### ***Output Format***

The output prints n space-separated integers representing the Next Greater Element for each element in the array.

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: 6

4 5 2 10 8 6

Output: 5 10 10 -1 -1 -1

### ***Answer***

```
// You are using Java
```

```
// You are using Java
```

```
import java.util.Scanner;
```

```
import java.util.Stack;
```

```
public class Main {
```

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

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

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

```
        int[] arr = new int[n];
```

```
        int[] nge = new int[n];
```

```

for (int i = 0; i < n; i++) {
    arr[i] = sc.nextInt();
}
Stack<Integer> stack = new Stack<>();
for (int i = 0; i < n; i++) {
    while (!stack.isEmpty() && arr[i] > arr[stack.peek()]) {
        int idx = stack.pop();
        nge[idx] = arr[i];
    }
    stack.push(i);
}
while (!stack.isEmpty()) {
    nge[stack.pop()] = -1;
}

for (int i = 0; i < n; i++) {
    System.out.print(nge[i] + " ");
}
sc.close();
}
}

```

**Status :** Correct

**Marks :** 10/10

## 2. Problem Statement

Arun is building a task manager to keep track of tasks using a LinkedList. The task manager supports the following operations:

"ADD <task>" Adds the given task to the end of the list."REMOVE" Removes the first task from the list."SHOW" Displays all tasks in the list in order. If the list is empty, print "EMPTY".

Help Arun implement this functionality using a LinkedList.

### **Input Format**

The first line of the input consists of an integer n, the number of operations.

The next n lines, each containing a command:

- "ADD <task>"
- "REMOVE"
- "SHOW"

### ***Output Format***

For each "SHOW" command, the output prints the tasks in order, separated by spaces.

If no tasks exist, print "EMPTY".

Refer to the sample output for formatting specifications.

### ***Sample Test Case***

Input: 5

ADD homework

ADD project

SHOW

REMOVE

SHOW

Output: homework project  
project

### ***Answer***

```
// You are using Java
import java.util.LinkedList;
import java.util.Scanner;
```

```
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        sc.nextLine();
```

```
        LinkedList<String> tasks = new LinkedList<>();
```

```
        for (int i = 0; i < n; i++) {
            String input = sc.nextLine();
```

```

        if (input.startsWith("ADD ")) {
            String task = input.substring(4).trim();
            tasks.addLast(task);
        } else if (input.equals("REMOVE")) {
            if (!tasks.isEmpty()) {
                tasks.removeFirst();
            }
        } else if (input.equals("SHOW")) {
            if (tasks.isEmpty()) {
                System.out.print("EMPTY ");
            } else {
                for (String t : tasks) {
                    System.out.print(t + " ");
                }
            }
        }
    }
    sc.close();
}
}

```

**Status :** Correct

**Marks :** 10/10

### 3. Problem Statement

Rekha is a teacher who wants to calculate the average of marks scored by her students in a test. She needs to store all the marks dynamically because the number of students may vary each time. Using an ArrayList allows her to easily add any number of marks without worrying about the initial size.

Help her implement the task.

#### **Input Format**

The first line of input is an integer  $n$ , representing the number of students..

The second line of input consists of  $n$  double values, representing the marks of each student, separated by a space.

#### **Output Format**

The output prints: "Average of the list: " followed by the average value formatted to two decimal places.

Refer to the sample output for the formatting specifications.

### **Sample Test Case**

Input: 5

1.0 2.0 3.0 4.0 5.0

Output: Average of the list: 3.00

### **Answer**

```
// You are using Java
import java.util.ArrayList;
import java.util.Scanner;
```

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

        int n = sc.nextInt();
        ArrayList<Double> marksList = new ArrayList<>();

        for (int i = 0; i < n; i++) {
            marksList.add(sc.nextDouble());
        }

        double sum = 0;
        for (double mark : marksList) {
            sum += mark;
        }

        double average = sum / n;
        System.out.printf("Average of the list: %.2f%n", average);
        sc.close();
    }
}
```

**Status : Correct**

**Marks : 10/10**

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## 2024\_28\_III\_OOPS Using Java Lab

### REC\_2028\_OOPS using Java\_Week 9\_CY

Attempt : 1  
Total Mark : 40  
Marks Obtained : 20

#### Section 1 : Coding

##### 1. Problem Statement

Sanjay is working on a program to merge two sorted linked lists into a single sorted list using Java's LinkedList class from the Collections framework. Given two sorted linked lists, he wants to merge them while maintaining the sorted order.

Write a Java program that:

Reads two sorted linked lists. Merges them into a single sorted linked list. Prints the merged list in ascending order.

##### ***Input Format***

The first line contains an integer  $m$  (the size of the first linked list).

The second line contains  $m$  space-separated integers (sorted).



The third line contains an integer n (the size of the second linked list).

The fourth line contains n space-separated integers (sorted).

**Output Format**

The output prints the merged linked list as space-separated integers.

Refer to the sample output for formatting specifications.

**Sample Test Case**

Input: 2

5 10

3

1 3 8

Output: 1 3 5 8 10

**Answer**

-

**Status :** Skipped

**Marks :** 0/10

**2. Problem Statement**

A teacher is filtering a list of words provided by students. Some words contain too many vowels, making them difficult for a spelling competition. The teacher decides to remove all words that contain more than two vowels.

Help the teacher to implement it using ArrayList.

**Input Format**

The first line contains an integer N, representing the number of words in the list.

The next N lines contain a string representing the words (one per line).

**Output Format**

The output consists of words that contain two or less than two vowels, printed in the same order they appeared in the input. Each word is printed on a new line.

Refer to the sample output for the formatting specifications.

**Sample Test Case**

Input: 1

sri

Output: sri

**Answer**

**Status :** Skipped

**Marks :** 0/10

### 3. Problem Statement

Rahul is working on a list manipulation problem where he needs to reverse a specific subarray using a stack. Given an array and two indices  $l$  and  $r$ , he wants to reverse only the portion of the array from index  $l$  to  $r$  (both inclusive) while keeping the rest of the array unchanged.

Since Rahul wants to solve this problem efficiently, he decides to use a stack to reverse the subarray in  $O(r - l)$  time.

Your task is to help Rahul by implementing this functionality.

**Input Format**

The first line contains an integer  $n$ , the size of the array.

The second line contains  $n$  space-separated integers  $arr[i]$ .

The third line contains two integers  $l$  and  $r$ , denoting the start and end indices of the subarray to reverse.

Note: The array follows 0-based indexing.

### **Output Format**

The output prints the modified array after reversing the subarray between indices l and r.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 6

1 2 3 4 5 6

1 4

Output: 1 5 4 3 2 6

### **Answer**

```
import java.util.*;

public class Main {

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

        // Read the size of the array
        int n = scanner.nextInt();
        int[] arr = new int[n];

        // Read the elements of the array
        for (int i = 0; i < n; i++) {
            arr[i] = scanner.nextInt();
        }

        // Read the indices l and r
        int l = scanner.nextInt();
        int r = scanner.nextInt();

        // Reverse the subarray using a stack
        reverseSubarray(arr, l, r);

        // Print the modified array
        for (int num : arr) {
```

```

        System.out.print(num + " ");
    }
}

private static void reverseSubarray(int[] arr, int l, int r) {
    Stack<Integer> stack = new Stack<>();

    // Push the elements from l to r onto the stack
    for (int i = l; i <= r; i++) {
        stack.push(arr[i]);
    }

    // Pop the elements from the stack back into the array
    for (int i = l; i <= r; i++) {
        arr[i] = stack.pop();
    }
}
}

```

**Status :** Correct

**Marks :** 10/10

#### 4. Problem Statement

Mesa, a store manager, needs a program to manage inventory items. Define a class ItemType with private attributes for name, deposit, and cost per day. Create an ArrayList in the Main class to store ItemType objects, allowing input and display.

Note: Use "%-20s%-20s%-20s" for formatting output in tabular format, display double values with 1 decimal place.

##### **Input Format**

The first line of input consists of an integer n, representing the number of items.

For each of the n items, there are three lines:

1. The name of the item (a string)
2. The deposit amount (a double value)
3. The cost per day (a double value)

### **Output Format**

The output prints a formatted table with columns for name, deposit and cost per day.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 3

Laptop

10000.0

250.0

Light

1000.0

50.0

Fan

1000.0

100.0

Output: Name                      Deposit                      Cost Per Day

Laptop	10000.0	250.0
Light	1000.0	50.0
Fan	1000.0	100.0

### **Answer**

```
import java.util.ArrayList;
```

```
import java.util.List;
```

```
import java.util.Scanner;
```

```
class ItemType {
```

```
    private String n;
```

```
    private double d;
```

```
    private double c;
```

```
    public ItemType(String n, double d, double c) {
```

```
        this.n = n;
```

```
        this.d = d;
```

```
        this.c = c;
```

```
    }
```

```

@Override
public String toString() {
    return String.format("%-20s%-20.1f%-20.1f", n, d, c);
}
}

class ArrayListObjectMain {
    public static void main(String args[]) {
        List<ItemType> items = new ArrayList<>();
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());

        for (int i = 0; i < n; i++) {
            String name = sc.nextLine();
            Double deposit = Double.parseDouble(sc.nextLine());
            Double costPerDay = Double.parseDouble(sc.nextLine());
            items.add(new ItemType(name, deposit, costPerDay));
        }
        System.out.format("%-20s%-20s%-20s", "Name", "Deposit", "Cost Per Day");
        System.out.println();

        for (ItemType item : items) {
            System.out.println(item);
        }
    }
}

```

**Status :** Correct

**Marks :** 10/10