VIGNESH BALAJI S **JAVA LAB**

205001126 CSE B **EX 02**

Q1) Write a java program to get ‘n’ elements in an array. Perform the linear and binary search.

```
import java.util.*;
class Q1{
    static int binS(int ele,int l,int r, int arr[]){
        if(r>=l){
            int mid=l+(r-l)/2;
            if(arr[mid]==ele) return mid;
            else if(arr[mid]>ele) return binS(ele,l,mid-1,arr);
            else return binS(ele,mid+1,r,arr);
        }
        else return -1;

    }
    static int linS(int ele,int arr[],int n){
        for(int x=0;x<n;x++){
            if(arr[x]==ele) return x;
        }
        return -1;
    }
    public static void main(String []args){
        Scanner sobj = new Scanner(System.in);
        System.out.println("Enter n value: ");
        int n = sobj.nextInt();
        int []arr = new int[n];
        for(int i=0;i<n;i++){
            System.out.println("Enter element" + (i+1)+": ");
            arr[i] = sobj.nextInt();
        }
        System.out.println("Enter element to be found: ");
        int ele = sobj.nextInt();
        System.out.println("Input Array:\n"+Arrays.toString(arr));
        int pos2 = linS(ele,arr,n);
        System.out.println("using ls ele found at "+pos2);
        Arrays.sort(arr);
        System.out.println("After Sorting:\n"+Arrays.toString(arr));
        int pos1 = binS(ele,0,n-1,arr);
        System.out.println("using bs ele found at "+pos1);
        sobj.close();

    }
}
```

OUTPUT:

```
E:\sem3\javaLab\ex02>java Q1
Enter n value:
10
Enter element1:
2
Enter element2:
4
Enter element3:
6
Enter element4:
8
Enter element5:
1
Enter element6:
3
Enter element7:
5
Enter element8:
7
Enter element9:
9
Enter element10:
13
Enter element to be found:
3
Input Array:
[2, 4, 6, 8, 1, 3, 5, 7, 9, 13]
using ls ele found at 5
After Sorting:
[1, 2, 3, 4, 5, 6, 7, 8, 9, 13]
using bs ele found at 2
```

Q2) Write a java program to find matrix addition, subtraction and multiplication.

```
class Q2{
    static void printMat(int[][] mat, int r,int c){
        for(int i=0;i<r;i++){
            for(int j=0;j<c;j++){
                System.out.print(mat[i][j]+" ");
            }
            System.out.println(" ");
        }
    }
    static void add(int[][] a, int[][] b, int r, int c){
        int[][] res = new int[r][c];
        for(int i=0;i<r;i++){
            for(int j=0;j<c;j++){
                res[i][j]=a[i][j]+b[i][j];
            }
        }
        printMat(res,r,c);
    }

    static void sub(int[][] a, int[][] b, int r, int c){
        int[][] res = new int[r][c];
        for(int i=0;i<r;i++){
            for(int j=0;j<c;j++){
                res[i][j]=a[i][j]-b[i][j];
            }
        }
        printMat(res,r,c);
    }

    static void multiply(int[][] m1, int[][] m2, int r1, int c1, int r2, int c2){
        if(c1!=r2) System.out.println("Cannot multiply");
        else{
            int[][] res = new int[r1][c2];
            int sum;
            for(int i=0;i<r1;i++){
                for(int j=0;j<c2;j++){
                    sum=0;
                    for(int k=0;k<c1;k++){
                        sum+=m1[i][k] * m2[k][j];
                    }
                    res[i][j] = sum;
                }
            }
            printMat(res,r1,c2);
        }
    }
    public static void main(String[] args){
        int[][] a = {{1,2,3},{4,5,6}};
        int[][] b = {{10,11},{20,21},{30,31}};
        System.out.println("Matrix A:");
        printMat(a, 2, 3);
        System.out.println("Matrix B:");
        printMat(b, 3, 2);
        System.out.println("A X B:");
```

```
        multiply(a,b,2,3,3,2);
        int[][] c = {{1,1,1},{1,1,1}};
        System.out.println("Matrix A:");
        printMat(a, 2, 3);
        System.out.println("Matrix B:");
        printMat(c, 2, 3);;
        System.out.println("A + B:");
        add(a, c, 2, 3);
        System.out.println("A - B:");
        sub(a, c, 2, 3);

    }
}
```

OUTPUT:

```
E:\sem3\javaLab\ex02>java Q2
Matrix A:
1 2 3
4 5 6
Matrix B:
10 11
20 21
30 31
A X B:
140 146
320 335
Matrix A:
1 2 3
4 5 6
Matrix B:
1 1 1
1 1 1
A + B:
2 3 4
5 6 7
A - B:
0 1 2
3 4 5
```

Q3) Write a Java program to get a sentence and find the longest word in it. Also find it's index position.

```java
import java.util.Scanner;
class Q3{
    public static void main(String[] args)
    {
        Scanner r=new Scanner(System.in);
        System.out.println("Enter a sentence");
        String str=r.nextLine();
        str+=" ";
        String longw="";
        String temp="";
        int index=0;
        for(int i=0;i<str.length();i++){
            if(str.charAt(i)==' '){
                if(temp.length()>longw.length()){
                    longw=temp;
                    temp="";
                    index=i-longw.length();
                }
                else temp="";
            }
            else temp=temp+str.charAt(i);
        }

        System.out.println("The largest word is: " + longw);
        System.out.println("The index number is: " +index);
        r.close();
    }
}
```

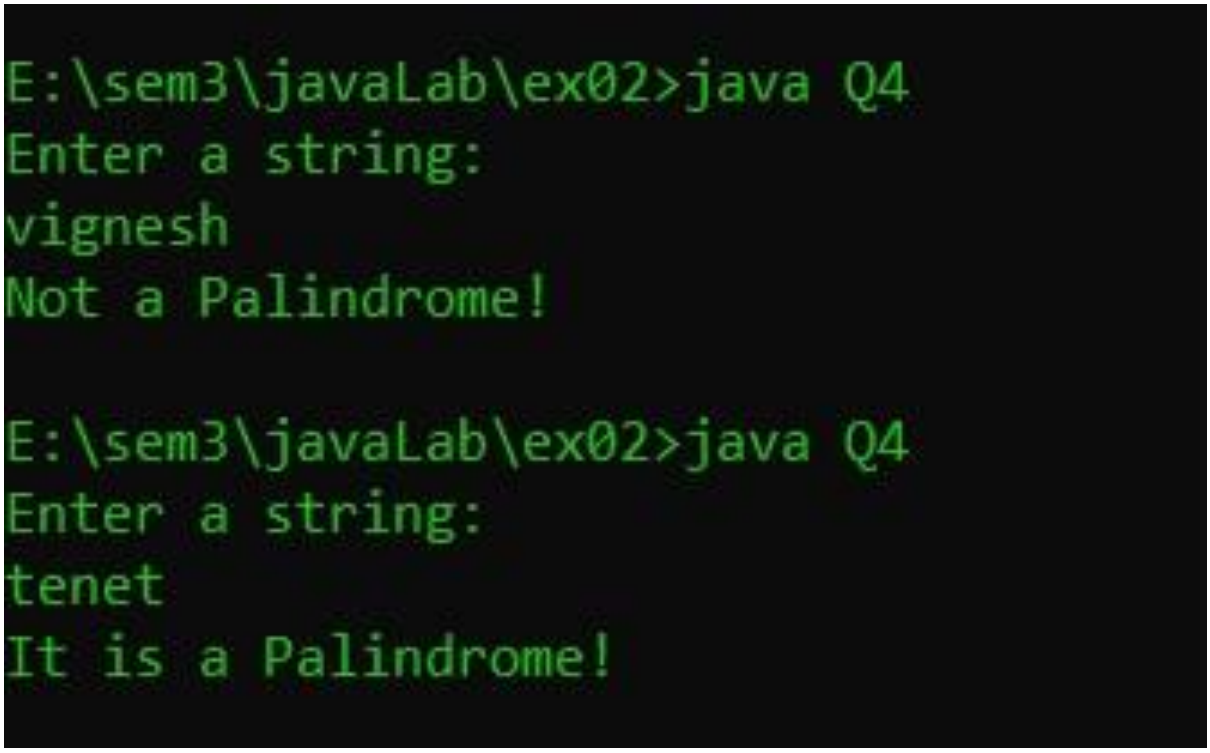
OUTPUT:

```
E:\sem3\javaLab\ex02>java Q3
Enter a sentence
my name is vigneshbalaji and i am 18 years old
The largest word is: vigneshbalaji
The index number is: 11
```

Q4) Write a Java program to get a string and verify whether it's a Palindrome or not.

```java
import java.util.Scanner;
class Q4{
    public static void main(String[] args)
    {
        Scanner r=new Scanner(System.in);
        System.out.println("Enter a string: ");
        String str=r.nextLine();
        String strRev="";
        for(int i=str.length()-1;i>=0;i--){
            strRev+=str.charAt(i);
        }
        if(str.equals(strRev)) System.out.println("It is a Palindrome!");
        else System.out.println("Not a Palindrome!");
        r.close();
    }
}
```

OUTPUT:



Q5) Write a Java program to check if the given sentence is a Pangram

```java
import java.util.Scanner;
class Q5{
    public static void main(String[] args)
    {
        Scanner r=new Scanner(System.in);
        System.out.println("Enter a string: ");
        String str=r.nextLine();
        str = str.replaceAll("\\s", "");
        int[] data = new int[26];
        for(int i=0;i<str.length();i++){
            int asci = str.charAt(i);
            data[asci-97]++;
        }
        boolean yes = true;
        for(int i=0; i<26;i++){
            if(data[i]==0){
                yes = false;break;
            }
        }
        if(yes) System.out.println("It is a Pangram");
        else  System.out.println("Not a Pangram");
    }
}
```

OUTPUT:

```
E:\sem3\javaLab\ex02>java Q5
Enter a string:
my name is vignesh
Not a Pangram

E:\sem3\javaLab\ex02>java Q5
Enter a string:
the quick brown fox jumps over the lazy dog
It is a Pangram
```