# DSA Practise Set – 1

## Date: 10-11-2024

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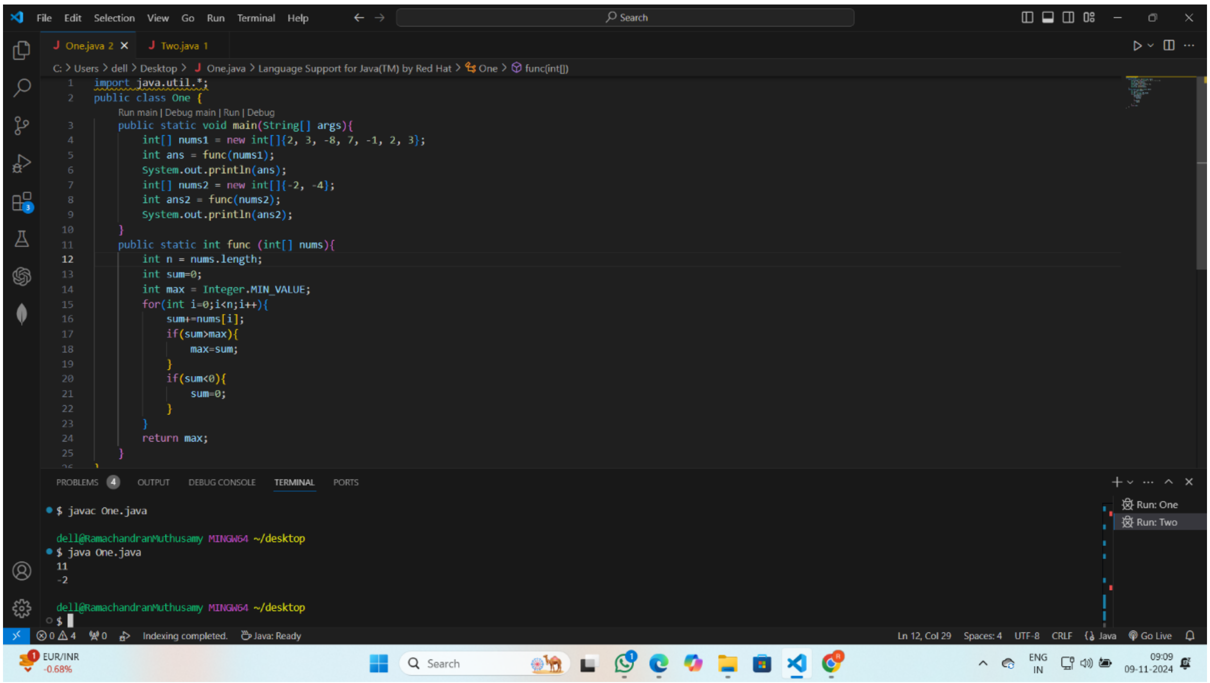
**Reg No: 22CS124**

**Dept: Computer Science Engineering**

## Problem 1:

```
import java.util.*;
public class One {
  public static void main(String[] args){
    int[] nums1 = new int[]{2, 3, -8, 7, -1, 2, 3};
    int ans = func(nums1);
    System.out.println(ans);
    int[] nums2 = new int[]{-2, -4};
    int ans2 = func(nums2);
    System.out.println(ans2);
  }
  public static int func (int[] nums){
    int n = nums.length;
    int sum=0;
    int max = Integer.MIN_VALUE;
    for(int i=0;i<n;i++){
      sum+=nums[i];
      if(sum>max){
        max=sum;
      }
      if(sum<0){
        sum=0;
      }
    }
```

```
        return max;
    }
}
```



File Edit Selection View Go Run Terminal Help
Search
One.java 2
Two.java 1
C: > Users > dell > Desktop > One.java > Language Support for Java(TM) by Red Hat > One > func(int[])
Run main | Debug main | Run | Debug

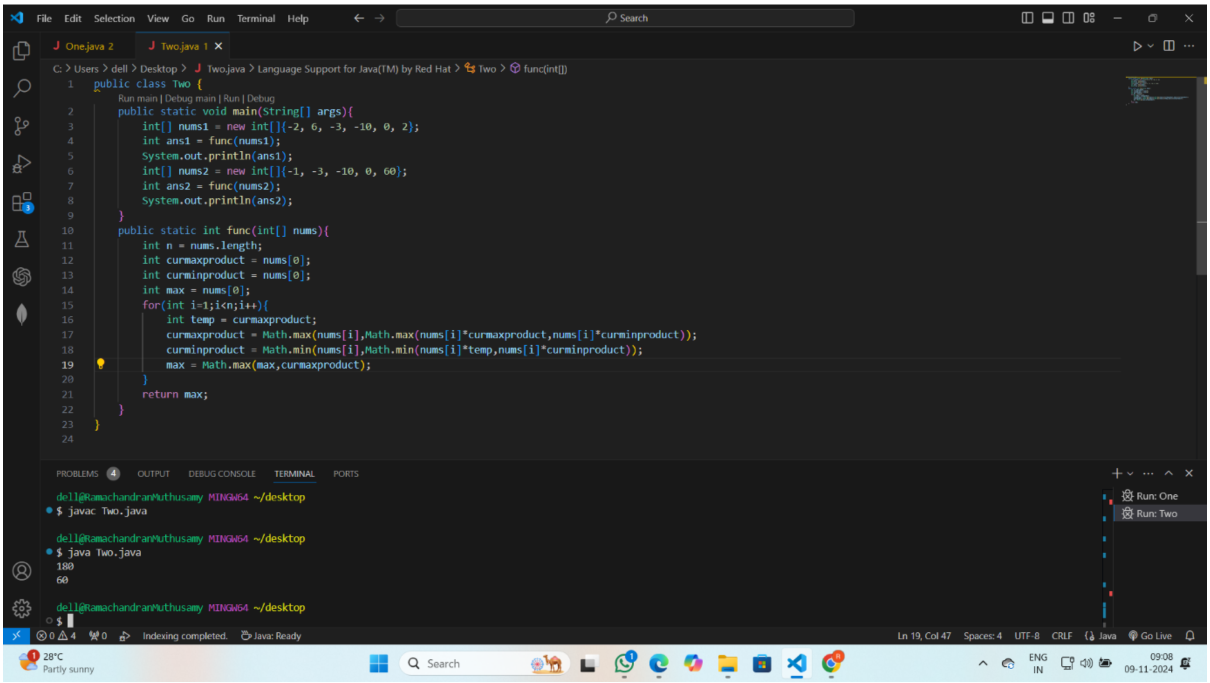
```
import java.util.*;
public class One {
    public static void main(String[] args){
        int[] nums1 = new int[]{2, 3, -8, 7, -1, 2, 3};
        int ans = func(nums1);
        System.out.println(ans);
        int[] nums2 = new int[]{-2, -4};
        int ans2 = func(nums2);
        System.out.println(ans2);
    }
    public static int func (int[] nums){
        int n = nums.length;
        int sum=0;
        int max = Integer.MIN_VALUE;
        for(int i=0;i<n;i++){
            sum+=nums[i];
            if(sum>max){
                max=sum;
            }
            if(sum<0){
                sum=0;
            }
        }
        return max;
    }
```

PROBLEMS 4
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS

```
$ javac One.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java One.java
11
-2

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ 
```

## Problem 2:

```
public class Two {
    public static void main(String[] args){
        int[] nums1 = new int[]{-2, 6, -3, -10, 0, 2};
        int ans1 = func(nums1);
        System.out.println(ans1);
        int[] nums2 = new int[]{-1, -3, -10, 0, 60};
        int ans2 = func(nums2);
        System.out.println(ans2);
    }
    public static int func(int[] nums){
        int n = nums.length;
        int curmaxproduct = nums[0];
        int curminproduct = nums[0];
        int max = nums[0];
        for(int i=1;i<n;i++){
            int temp = curmaxproduct;
            curmaxproduct =
Math.max(nums[i],Math.max(nums[i]*curmaxproduct,nums[i]*curminproduct));
            curminproduct = Math.min(nums[i],Math.min(nums[i]*temp,nums[i]*curminproduct));
            max = Math.max(max,curmaxproduct);
        }
        return max;
    }
}
```

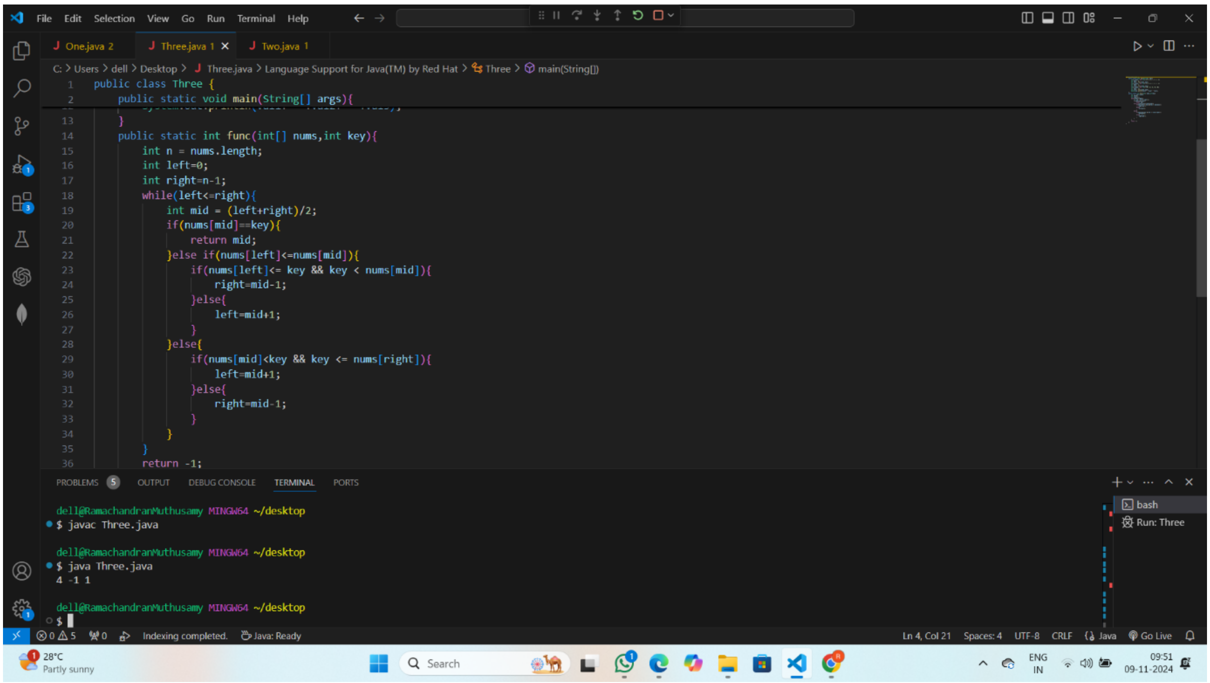

File Edit Selection View Go Run Terminal Help
Search
One.java 2
Two.java 1
C: > Users > dell > Desktop > Two.java > Language Support for Java(TM) by Red Hat > Two > func(int[])
Run main | Debug main | Run | Debug
PROBLEMS 4
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Run: One
Run: Two
0 4 0 Indexing completed. Java: Ready
Ln 19, Col 47 Spaces: 4 UTF-8 CRLF Java Go Live
28°C Partly sunny
Search
ENG IN
09:08 09-11-2024

```
public class Two {
    public static void main(String[] args){
        int[] nums1 = new int[]{-2, 6, -3, -10, 0, 2};
        int ans1 = func(nums1);
        System.out.println(ans1);
        int[] nums2 = new int[]{-1, -3, -10, 0, 60};
        int ans2 = func(nums2);
        System.out.println(ans2);
    }
    public static int func(int[] nums){
        int n = nums.length;
        int curmaxproduct = nums[0];
        int curminproduct = nums[0];
        int max = nums[0];
        for(int i=1;i<n;i++){
            int temp = curmaxproduct;
            curmaxproduct = Math.max(nums[i],Math.max(nums[i]*curmaxproduct,nums[i]*curminproduct));
            curminproduct = Math.min(nums[i],Math.min(nums[i]*temp,nums[i]*curminproduct));
            max = Math.max(max,curmaxproduct);
        }
        return max;
    }
}
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ javac Two.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Two.java
180
60

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 3:

```
public class Three {
    public static void main(String[] args){
        int[] nums1 = new int[] {4, 5, 6, 7, 0, 1, 2};
        int key1 = 0;
        int val1 = func(nums1,key1);
        int[] nums2 = new int[] {4, 5, 6, 7, 0, 1, 2};
        int key2 = 3;
        int val2 = func(nums2,key2);
        int[] nums3 = new int[] {50, 10, 20, 30, 40};
        int key3 = 10;
        int val3 = func(nums3,key3);
        System.out.println(val1+" "+val2+" "+val3);
    }
    public static int func(int[] nums,int key){
        int n = nums.length;
        int left=0;
        int right=n-1;
        while(left<=right){
            int mid = (left+right)/2;
            if(nums[mid]==key){
                return mid;
            }else if(nums[left]<=nums[mid]){
                if(nums[left]<= key && key < nums[mid]){
                    right=mid-1;
                }else{
                    left=mid+1;
                }
            }else{
                if(nums[mid]<key && key <= nums[right]){
                    left=mid+1;
                }else{
                    right=mid-1;
                }
            }
        }
        return -1;
    }
}
```



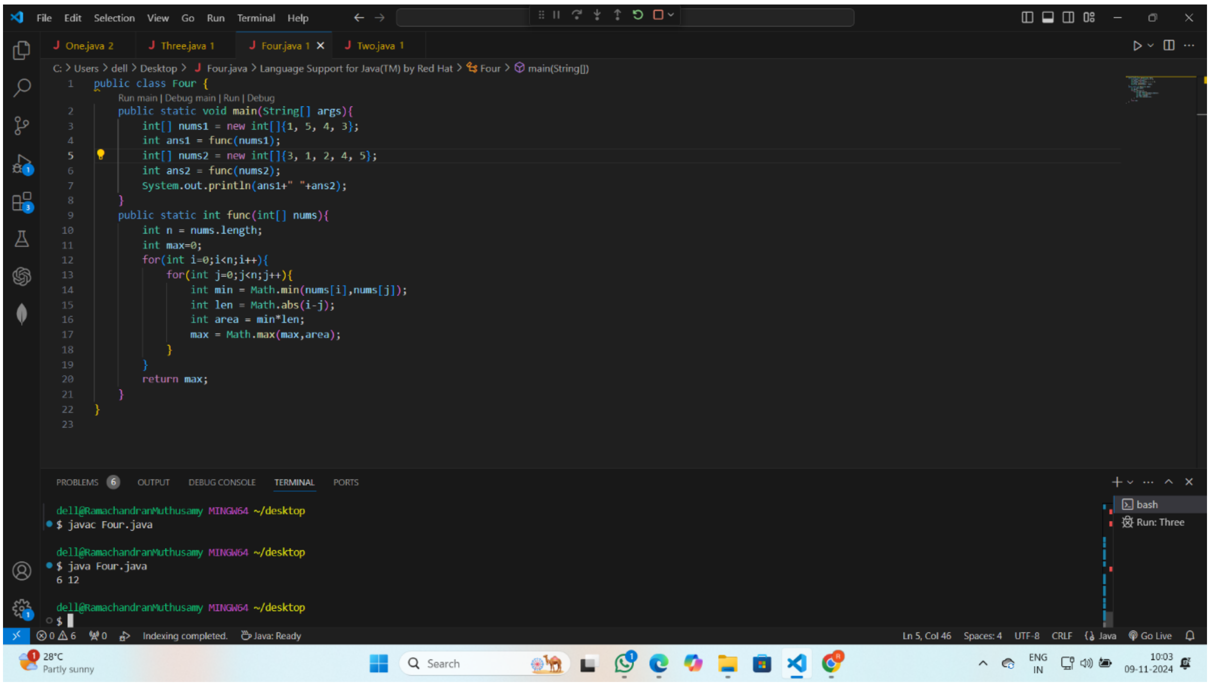
File Edit Selection View Go Run Terminal Help
One.java 2
Three.java 1
Two.java 1
C: > Users > dell > Desktop > Three.java > Language Support for Java(TM) by Red Hat > Three > main(String[])
PROBLEMS 5 OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash
Run: Three
0 5 0 Indexing completed. Java: Ready
Ln 4, Col 21 Spaces: 4 UTF-8 CRLF Java Go Live
28°C Partly sunny
Search
ENG IN
09:51 09-11-2024

```
public class Three {
    public static void main(String[] args){
    }
    public static int func(int[] nums,int key){
        int n = nums.length;
        int left=0;
        int right=n-1;
        while(left<=right){
            int mid = (left+right)/2;
            if(nums[mid]==key){
                return mid;
            }else if(nums[left]<=nums[mid]){
                if(nums[left]<= key && key < nums[mid]){
                    right=mid-1;
                }else{
                    left=mid+1;
                }
            }else{
                if(nums[mid]<key && key <= nums[right]){
                    left=mid+1;
                }else{
                    right=mid-1;
                }
            }
        }
        return -1;
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ javac Three.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Three.java
4 -1 1

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 4:

```
public class Four {
    public static void main(String[] args){
        int[] nums1 = new int[]{1, 5, 4, 3};
        int ans1 = func(nums1);
        int[] nums2 = new int[]{3, 1, 2, 4, 5};
        int ans2 = func(nums2);
        System.out.println(ans1+" "+ans2);
    }
    public static int func(int[] nums){
        int n = nums.length;
        int max=0;
        for(int i=0;i<n;i++){
            for(int j=0;j<n;j++){
                int min = Math.min(nums[i],nums[j]);
                int len = Math.abs(i-j);
                int area = min*len;
                max = Math.max(max,area);
            }
        }
        return max;
    }
}
```



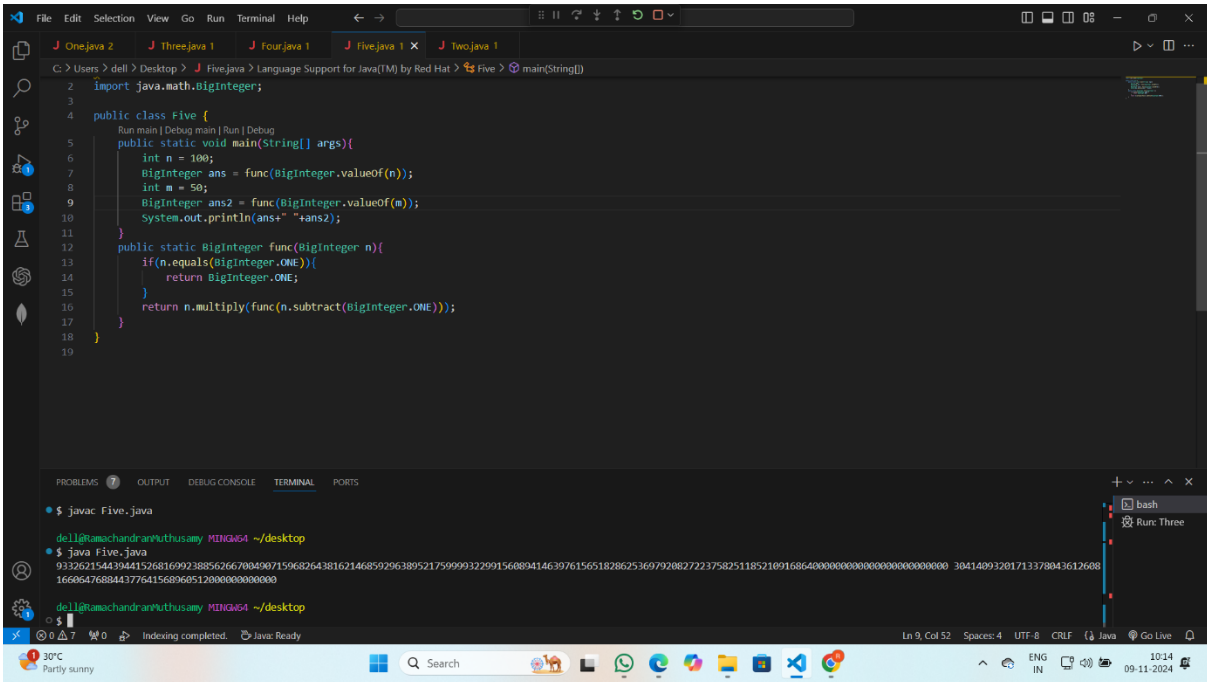
```
public class Four {
    public static void main(String[] args){
        int[] nums1 = new int[]{1, 5, 4, 3};
        int ans1 = func(nums1);
        int[] nums2 = new int[]{3, 1, 2, 4, 5};
        int ans2 = func(nums2);
        System.out.println(ans1+" "+ans2);
    }
    public static int func(int[] nums){
        int n = nums.length;
        int max=0;
        for(int i=0;i<n;i++){
            for(int j=0;j<n;j++){
                int min = Math.min(nums[i],nums[j]);
                int len = Math.abs(i-j);
                int area = min*len;
                max = Math.max(max,area);
            }
        }
        return max;
    }
}
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ javac Four.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Four.java
6 12

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

File Edit Selection View Go Run Terminal Help
One.java 2
Three.java 1
Four.java 1
Two.java 1
C: > Users > dell > Desktop > Four.java > Language Support for Java(TM) by Red Hat > Four > main(String[])
Run main | Debug main | Run | Debug
PROBLEMS 6
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
bash
Run: Three
0 6 0 Indexing completed. Java: Ready
Ln 5, Col 46 Spaces: 4 UTF-8 CRLF Java Go Live
28°C Partly sunny
Search
ENG IN
10:03 09-11-2024

## Problem 5:

```
import java.math.BigInteger;
public class Five {
    public static void main(String[] args){
        int n = 100;
        BigInteger ans = func(BigInteger.valueOf(n));
        int m = 50;
        BigInteger ans2 = func(BigInteger.valueOf(m));
        System.out.println(ans+" "+ans2);
    }
    public static BigInteger func(BigInteger n){
        if(n.equals(BigInteger.ONE)){
            return BigInteger.ONE;
        }
        return n.multiply(func(n.subtract(BigInteger.ONE)));
    }
}
```

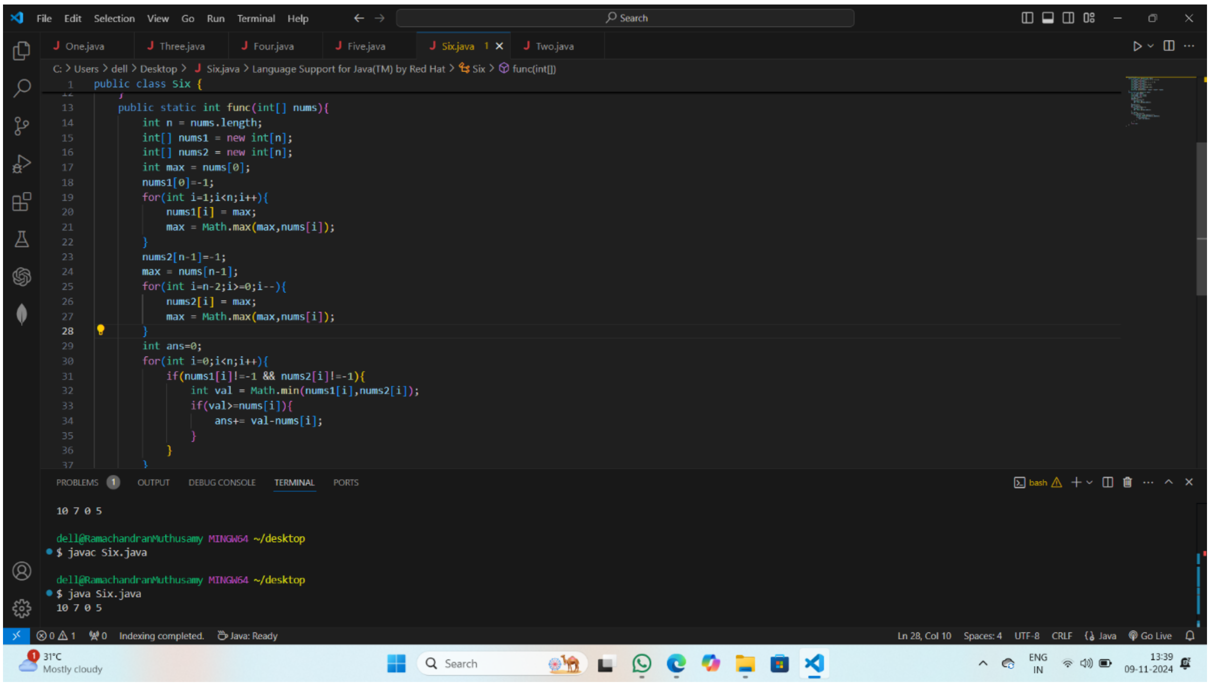


```
import java.math.BigInteger;

public class Five {
    Run main | Debug main | Run | Debug
    public static void main(String[] args){
        int n = 100;
        BigInteger ans = func(BigInteger.valueOf(n));
        int m = 50;
        BigInteger ans2 = func(BigInteger.valueOf(m));
        System.out.println(ans+" "+ans2);
    }
    public static BigInteger func(BigInteger n){
        if(n.equals(BigInteger.ONE)){
            return BigInteger.ONE;
        }
        return n.multiply(func(n.subtract(BigInteger.ONE)));
    }
}
```

```
$ javac Five.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Five.java
93326215443944152681699238856266700490715968264381621468592963895217599993229915608941463976156518286253697920827223758251185210916864000000000000000000000000 304140932017133780436126081660647688443776415689605120000000000000

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ 
```

## Problem 6:

```
public class Six {
    public static void main(String[] args){
        int[] nums1 = new int[]{3, 0, 1, 0, 4, 0, 2};
        int ans1 = func(nums1);
        int[] nums2 = new int[]{3, 0, 2, 0, 4};
        int ans2 = func(nums2);
        int[] nums3 = new int[]{1,2,3,4};
        int ans3 = func(nums3);
        int[] nums4 = new int[]{10,9,0,5};
        int ans4 = func(nums4);
        System.out.println(ans1+" "+ans2+" "+ans3+" "+ans4);
    }
    public static int func(int[] nums){
        int n = nums.length;
        int[] nums1 = new int[n];
        int[] nums2 = new int[n];
        int max = nums[0];
        nums1[0]=-1;
        for(int i=1;i<n;i++){
            nums1[i] = max;
            max = Math.max(max,nums[i]);
        }
        nums2[n-1]=-1;
        max = nums[n-1];
        for(int i=n-2;i>=0;i--){
            nums2[i] = max;
            max = Math.max(max,nums[i]);
        }
        int ans=0;
        for(int i=0;i<n;i++){
            if(nums1[i]!=-1 && nums2[i]!=-1){
                int val = Math.min(nums1[i],nums2[i]);
                if(val>=nums[i]){
                    ans+= val-nums[i];
                }
            }
        }
        return ans;
    }
}
```



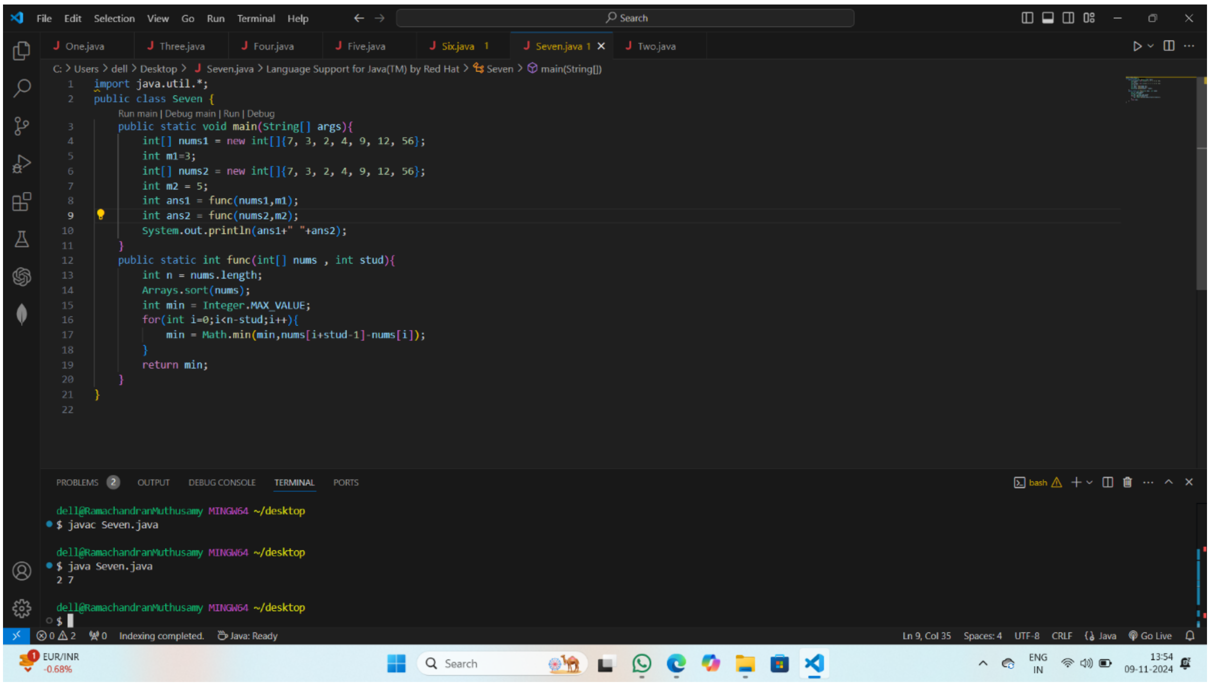
```
public class Six {
    }
    public static int func(int[] nums){
        int n = nums.length;
        int[] nums1 = new int[n];
        int[] nums2 = new int[n];
        int max = nums[0];
        nums1[0]=-1;
        for(int i=1;i<n;i++){
            nums1[i] = max;
            max = Math.max(max,nums[i]);
        }
        nums2[n-1]=-1;
        max = nums[n-1];
        for(int i=n-2;i>=0;i--){
            nums2[i] = max;
            max = Math.max(max,nums[i]);
        }
        int ans=0;
        for(int i=0;i<n;i++){
            if(nums1[i]!=-1 && nums2[i]!=-1){
                int val = Math.min(nums1[i],nums2[i]);
                if(val>=nums[i]){
                    ans+= val-nums[i];
                }
            }
        }
```

```
10 7 0 5

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ javac Six.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Six.java
10 7 0 5
```

File Edit Selection View Go Run Terminal Help
Search
One.java
Three.java
Four.java
Five.java
Six.java 1
Two.java
C: > Users > dell > Desktop > Six.java > Language Support for Java(TM) by Red Hat > Six > func(int[])
PROBLEMS 1
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
bash
0 1 0 Indexing completed. Java: Ready
Ln 28, Col 10 Spaces: 4 UTF-8 CRLF Java Go Live
31°C Mostly cloudy
Search
ENG IN
13:39 09-11-2024

## Problem 7:

```
import java.util.*;

public class Seven {

    public static void main(String[] args){

        int[] nums1 = new int[]{7, 3, 2, 4, 9, 12, 56};

        int m1=3;

        int[] nums2 = new int[]{7, 3, 2, 4, 9, 12, 56};

        int m2 = 5;

        int ans1 = func(nums1,m1);

        int ans2 = func(nums2,m2);

        System.out.println(ans1+" "+ans2);

    }

    public static int func(int[] nums , int stud){

        int n = nums.length;

        Arrays.sort(nums);

        int min = Integer.MAX_VALUE;

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

            min = Math.min(min,nums[i+stud-1]-nums[i]);

        }

        return min;
    }
}
```



```
import java.util.*;
public class Seven {
    public static void main(String[] args){
        int[] nums1 = new int[]{7, 3, 2, 4, 9, 12, 56};
        int m1=3;
        int[] nums2 = new int[]{7, 3, 2, 4, 9, 12, 56};
        int m2 = 5;
        int ans1 = func(nums1,m1);
        int ans2 = func(nums2,m2);
        System.out.println(ans1+" "+ans2);
    }
    public static int func(int[] nums , int stud){
        int n = nums.length;
        Arrays.sort(nums);
        int min = Integer.MAX_VALUE;
        for(int i=0;i<n-stud;i++){
            min = Math.min(min,nums[i+stud-1]-nums[i]);
        }
        return min;
    }
}
```

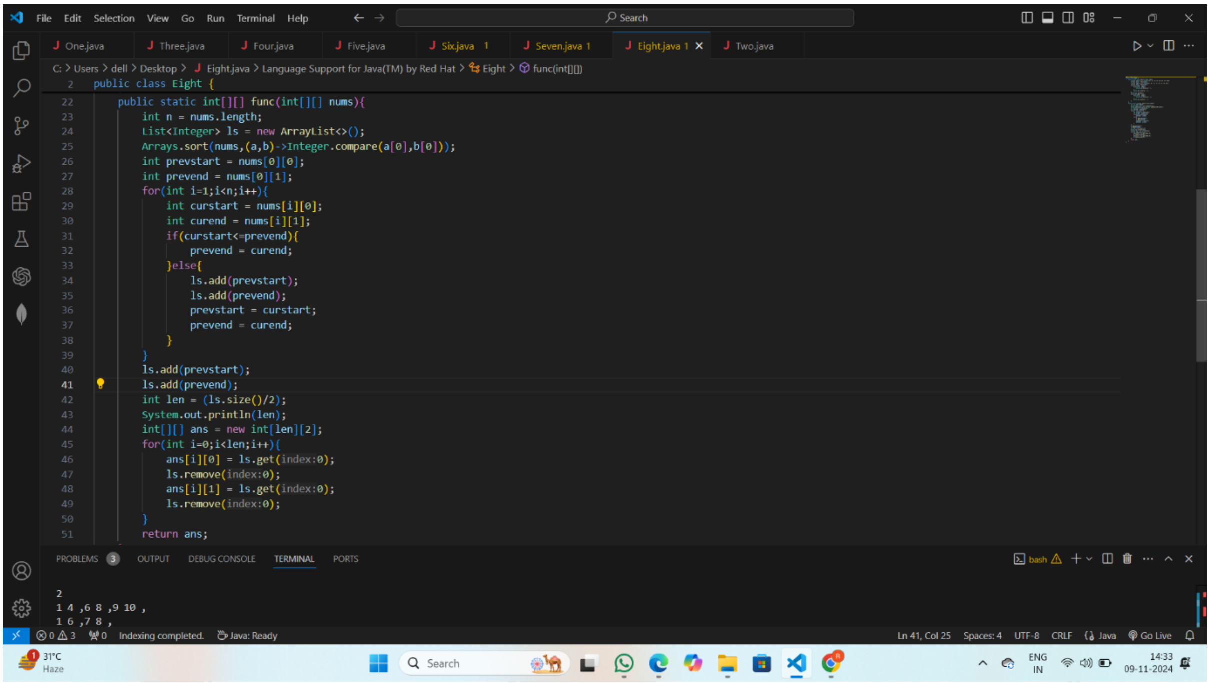
```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ javac Seven.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java Seven.java
2 7

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 8:

```
import java.util.*;

public class Eight {

    public static void main(String[] args){

        int[][] nums1 = new int[][] {{1, 3}, {2, 4}, {6, 8}, {9, 10}};

        int[][] ans1 = func(nums1);

        int[][] nums2 = new int[][]{{7, 8}, {1, 5}, {2, 4}, {4, 6}};

        int[][] ans2 = func(nums2);

        for(int[] temp : ans1){

            for(int no : temp){

                System.out.print(no+" ");

            }

            System.out.print(",");

        }

        System.out.println();

        for(int[] temp : ans2){
```

```
      for(int no : temp){
         System.out.print(no+" ");
      }
      System.out.print(",");
   }
}
public static int[][] func(int[][] nums){
   int n = nums.length;
   List<Integer> ls = new ArrayList<>();
   Arrays.sort(nums,(a,b)->Integer.compare(a[0],b[0]));
   int prevstart = nums[0][0];
   int prevend = nums[0][1];
   for(int i=1;i<n;i++){
      int curstart = nums[i][0];
      int curend = nums[i][1];
      if(curstart<=prevend){
         prevend = curend;
      }else{
         ls.add(prevstart);
         ls.add(prevend);
         prevstart = curstart;
         prevend = curend;
      }
   }
   ls.add(prevstart);
   ls.add(prevend);
   int len = (ls.size()/2);
   System.out.println(len);
   int[][] ans = new int[len][2];
   for(int i=0;i<len;i++){
      ans[i][0] = ls.get(0);
      ls.remove(0);
```

```
                ans[i][1] = ls.get(0);
                ls.remove(0);
            }
            return ans;
        }
}
```

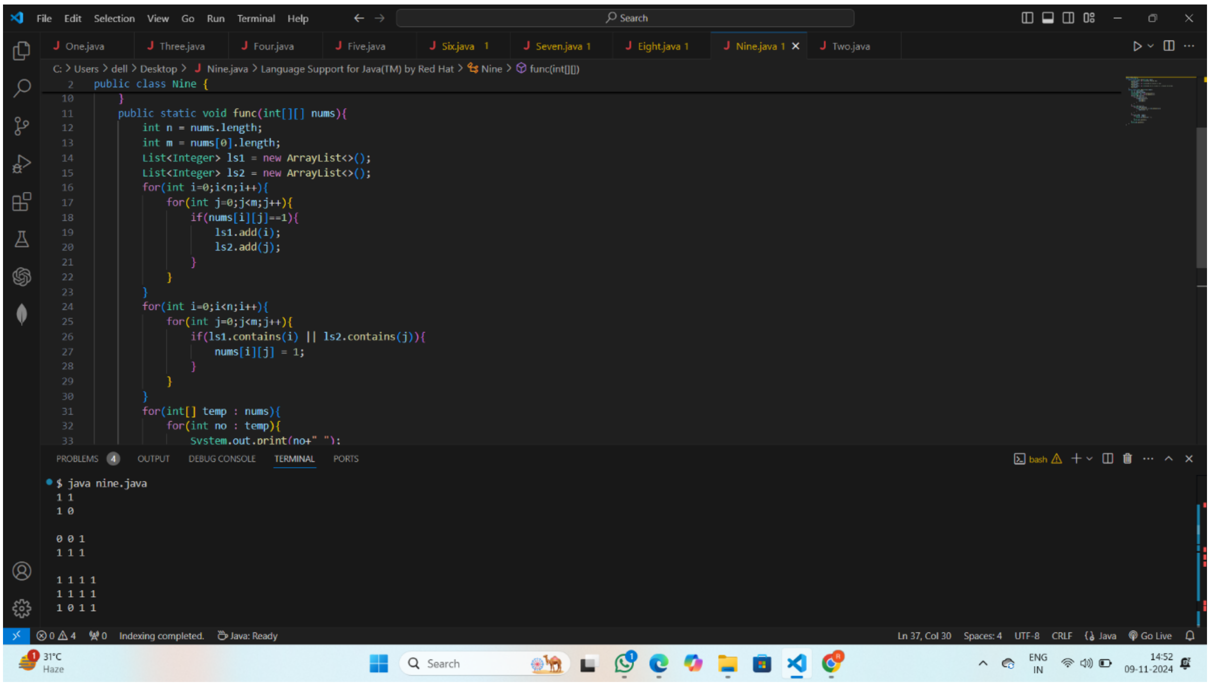


```
public class Eight {
    public static int[][] func(int[][] nums){
        int n = nums.length;
        List<Integer> ls = new ArrayList<>();
        Arrays.sort(nums,(a,b)->Integer.compare(a[0],b[0]));
        int prevstart = nums[0][0];
        int prevend = nums[0][1];
        for(int i=1;i<n;i++){
            int curstart = nums[i][0];
            int curend = nums[i][1];
            if(curstart<=prevend){
                prevend = curend;
            }else{
                ls.add(prevstart);
                ls.add(prevend);
                prevstart = curstart;
                prevend = curend;
            }
        }
        ls.add(prevstart);
        ls.add(prevend);
        int len = (ls.size()/2);
        System.out.println(len);
        int[][] ans = new int[len][2];
        for(int i=0;i<len;i++){
            ans[i][0] = ls.get(index:0);
            ls.remove(index:0);
            ans[i][1] = ls.get(index:0);
            ls.remove(index:0);
        }
        return ans;
```

```
2
1 4 ,6 8 ,9 10 ,
1 6 ,7 8 ,
```

## Problem 9:

```
import java.util.*;
public class Nine {
    public static void main(String[] args){
        int[][] mat1 = new int[][]{{1, 0},{0, 0}};
        func(mat1);
        int[][] mat2 = new int[][]{{0, 0, 0},{0, 0, 1}};
        func(mat2);
        int[][] mat3 = new int[][]{{1, 0, 0, 1},{0, 0, 1, 0},{0, 0, 0, 0}};
        func(mat3);
    }
    public static void func(int[][] nums){
        int n = nums.length;
        int m = nums[0].length;
        List<Integer> ls1 = new ArrayList<>();
        List<Integer> ls2 = new ArrayList<>();
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if(nums[i][j]==1){
                    ls1.add(i);
                    ls2.add(j);
                }
            }
        }
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if(ls1.contains(i) || ls2.contains(j)){
                    nums[i][j] = 1;
                }
            }
        }
        for(int[] temp : nums){
            for(int no : temp){
                System.out.print(no+" ");
            }
            System.out.println();
        }
        System.out.println();
    }
}
```

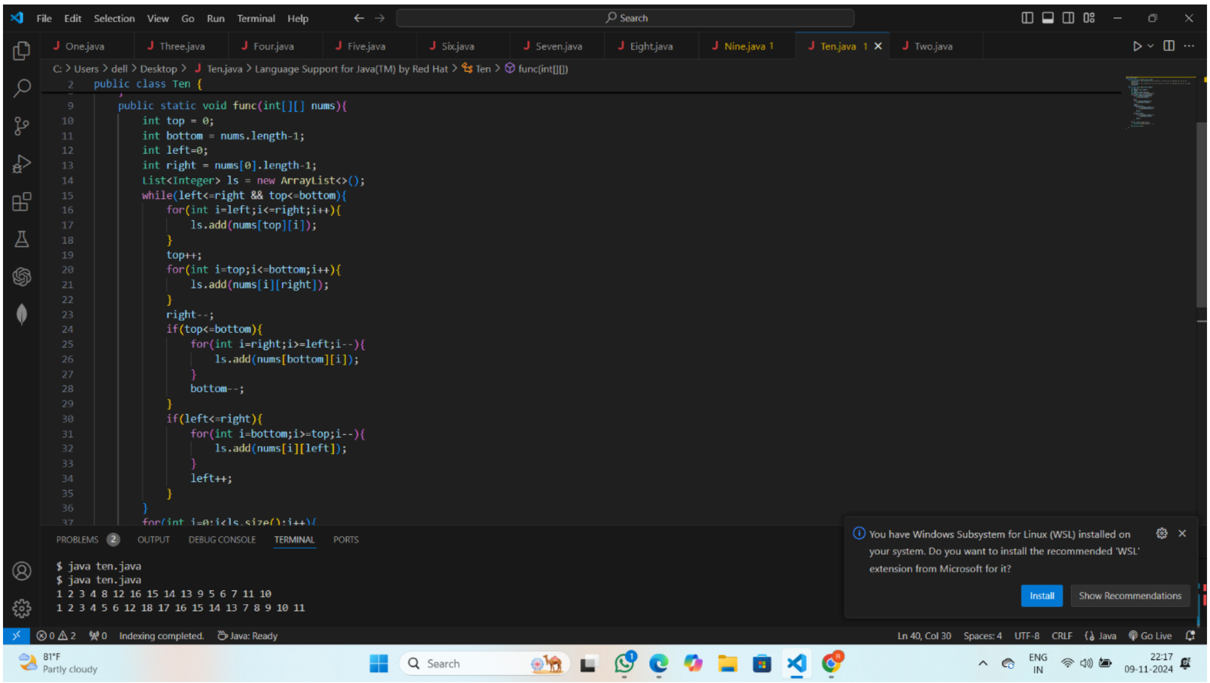


```
public class Nine {
    }
    public static void func(int[][] nums){
        int n = nums.length;
        int m = nums[0].length;
        List<Integer> ls1 = new ArrayList<>();
        List<Integer> ls2 = new ArrayList<>();
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if(nums[i][j]==1){
                    ls1.add(i);
                    ls2.add(j);
                }
            }
        }
        for(int i=0;i<n;i++){
            for(int j=0;j<m;j++){
                if(ls1.contains(i) || ls2.contains(j)){
                    nums[i][j] = 1;
                }
            }
        }
        for(int[] temp : nums){
            for(int no : temp){
                System.out.print(no+" ");
```

```
$ java nine.java
1 1
1 0

0 0 1
1 1 1

1 1 1 1
1 1 1 1
1 0 1 1
```

## Problem 10:

```
import java.util.*;
public class Ten {
    public static void main(String[] args){
        int[][] mat1 = new int[][] {{1, 2, 3, 4},{5, 6, 7, 8},{9, 10, 11, 12},{13, 14, 15, 16 }};
        func(mat1);
        int[][] mat2 = new int[][]{ {1, 2, 3, 4, 5, 6},{7, 8, 9, 10, 11, 12},{13, 14, 15, 16, 17, 18}};
        func(mat2);
    }
    public static void func(int[][] nums){
        int top = 0;
        int bottom = nums.length-1;
        int left=0;
        int right = nums[0].length-1;
        List<Integer> ls = new ArrayList<>();
        while(left<=right && top<=bottom){
            for(int i=left;i<=right;i++){
                ls.add(nums[top][i]);
            }
            top++;
            for(int i=top;i<=bottom;i++){
                ls.add(nums[i][right]);
            }
            right--;
            if(top<=bottom){
                for(int i=right;i>=left;i--){
                    ls.add(nums[bottom][i]);
                }
                bottom--;
            }
            if(left<=right){
                for(int i=bottom;i>=top;i--){
                    ls.add(nums[i][left]);
                }
                left++;
            }
        }
        for(int i=0;i<ls.size();i++){
            System.out.print(ls.get(i)+ " ");
        }
        System.out.println();
    }
}
```



C: > Users > dell > Desktop > Ten.java > Language Support for Java(TM) by Red Hat > Ten > func(int[][])

```java
public class Ten {
    public static void func(int[][] nums){
        int top = 0;
        int bottom = nums.length-1;
        int left=0;
        int right = nums[0].length-1;
        List<Integer> ls = new ArrayList<>();
        while(left<=right && top<=bottom){
            for(int i=left;i<=right;i++){
                ls.add(nums[top][i]);
            }
            top++;
            for(int i=top;i<=bottom;i++){
                ls.add(nums[i][right]);
            }
            right--;
            if(top<=bottom){
                for(int i=right;i>=left;i--){
                    ls.add(nums[bottom][i]);
                }
                bottom--;
            }
            if(left<=right){
                for(int i=bottom;i>=top;i--){
                    ls.add(nums[i][left]);
                }
                left++;
            }
        }
        for(int i=0;i<ls.size();i++){
```

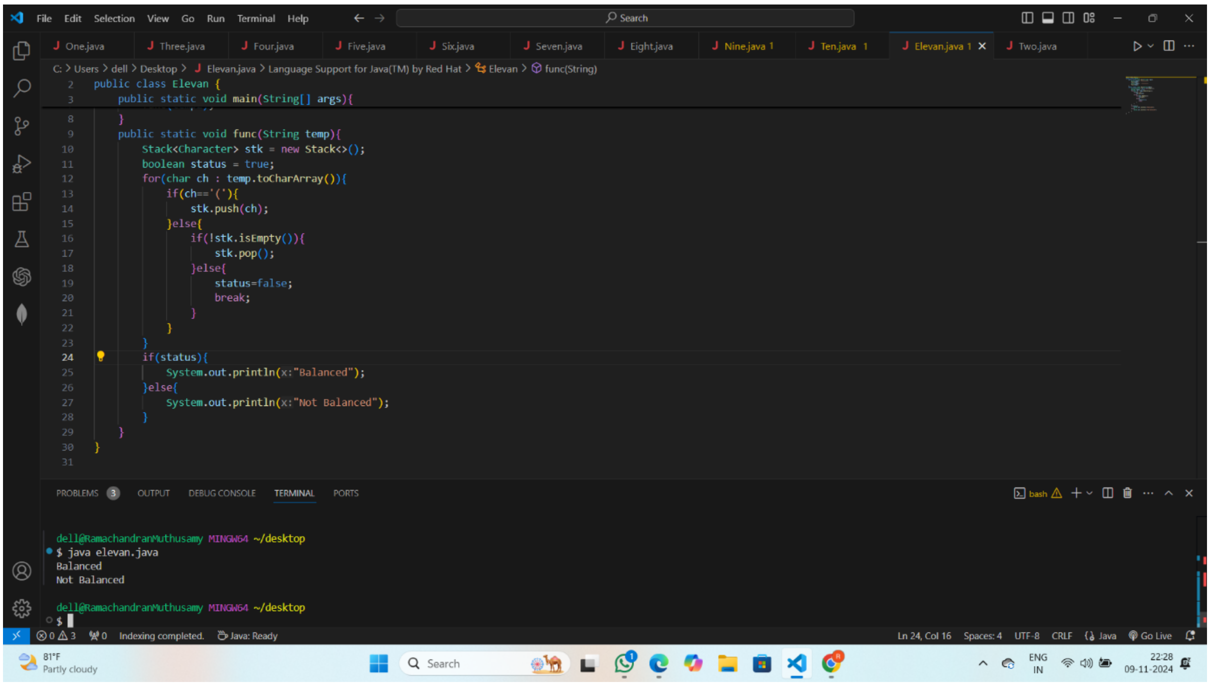
```
$ java ten.java
$ java ten.java
1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11
```

You have Windows Subsystem for Linux (WSL) installed on your system. Do you want to install the recommended 'WSL' extension from Microsoft for it?

## Problem 13:

```java
import java.util.*;

public class Thirteen {

   public static void main(String[] args){

      String temp1 = "((()))()()";

      func(temp1);

      String temp2 = " “())((())";

      func(temp2);

   }

   public static void func(String temp){

      Stack<Character> stk = new Stack<>();

      boolean status = true;

      for(char ch : temp.toCharArray()){

         if(ch=='('){

            stk.push(ch);

         }else{

            if(!stk.isEmpty()){

               stk.pop();

            }else{

               status=false;
```

```
                    break;
                }
            }
        }
        if(status){
            System.out.println("Balanced");
        }else{
            System.out.println("Not Balanced");
        }
    }
}
```



File Edit Selection View Go Run Terminal Help
Search
One.java
Three.java
Four.java
Five.java
Six.java
Seven.java
Eight.java
Nine.java 1
Ten.java 1
Elevan.java 1
Two.java
C: > Users > dell > Desktop > Elevan.java > Language Support for Java(TM) by Red Hat > Elevan > func(String)

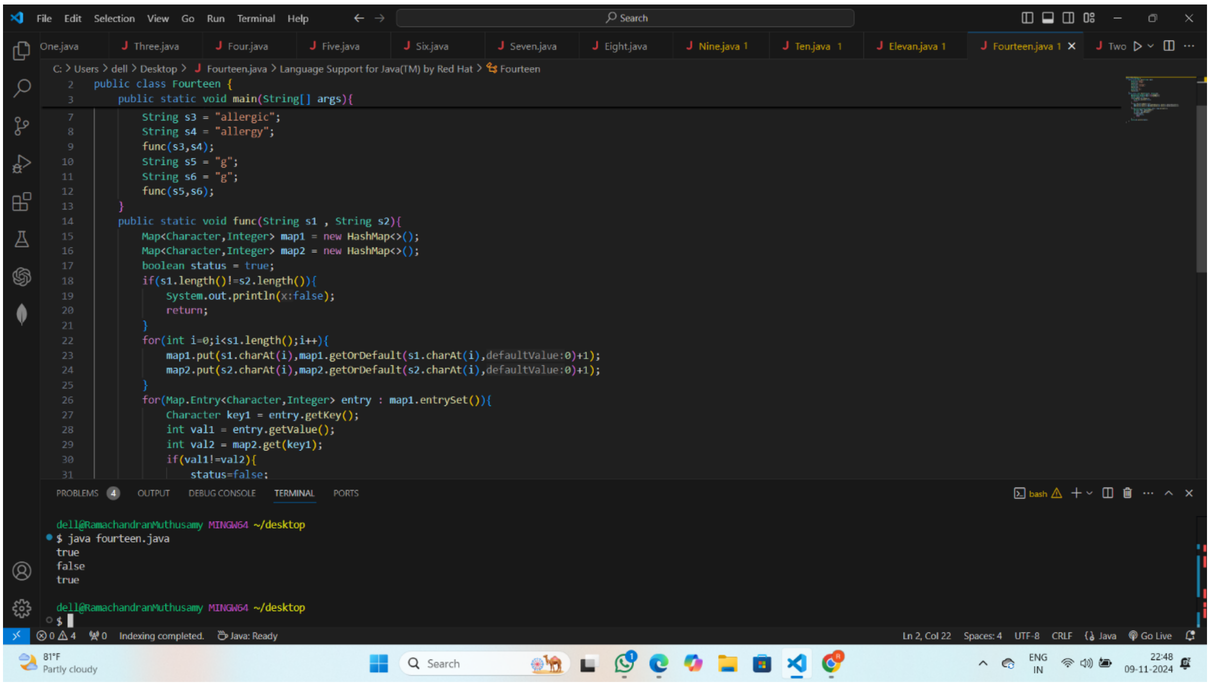
```
public class Elevan {
    public static void main(String[] args){
    }
    public static void func(String temp){
        Stack<Character> stk = new Stack<>();
        boolean status = true;
        for(char ch : temp.toCharArray()){
            if(ch=='('){
                stk.push(ch);
            }else{
                if(!stk.isEmpty()){
                    stk.pop();
                }else{
                    status=false;
                    break;
                }
            }
        }
        if(status){
            System.out.println(x:"Balanced");
        }else{
            System.out.println(x:"Not Balanced");
        }
    }
}
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java elevan.java
Balanced
Not Balanced

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

0 3 0 Indexing completed. Java: Ready
Ln 24, Col 16 Spaces: 4 UTF-8 CRLF Java Go Live
81°F
Partly cloudy
Search
ENG
IN
22:28
09-11-2024

## Problem 14:

```
import java.util.*;
public class Fourteen {
    public static void main(String[] args){
        String s1 = "geeks";
        String s2 = "kseeg";
        func(s1,s2);
        String s3 = "allergic";
        String s4 = "allergy";
        func(s3,s4);
        String s5 = "g";
        String s6 = "g";
        func(s5,s6);
    }
    public static void func(String s1 , String s2){
        Map<Character,Integer> map1 = new HashMap<>();
        Map<Character,Integer> map2 = new HashMap<>();
        boolean status = true;
        if(s1.length()!=s2.length()){
            System.out.println(false);
            return;
        }
        for(int i=0;i<s1.length();i++){
            map1.put(s1.charAt(i),map1.getOrDefault(s1.charAt(i),0)+1);
            map2.put(s2.charAt(i),map2.getOrDefault(s2.charAt(i),0)+1);
        }
        for(Map.Entry<Character,Integer> entry : map1.entrySet()){
            Character key1 = entry.getKey();
            int val1 = entry.getValue();
            int val2 = map2.get(key1);
            if(val1!=val2){
                status=false;
                break;
            }
        }
        System.out.println(status);
    }
}
```

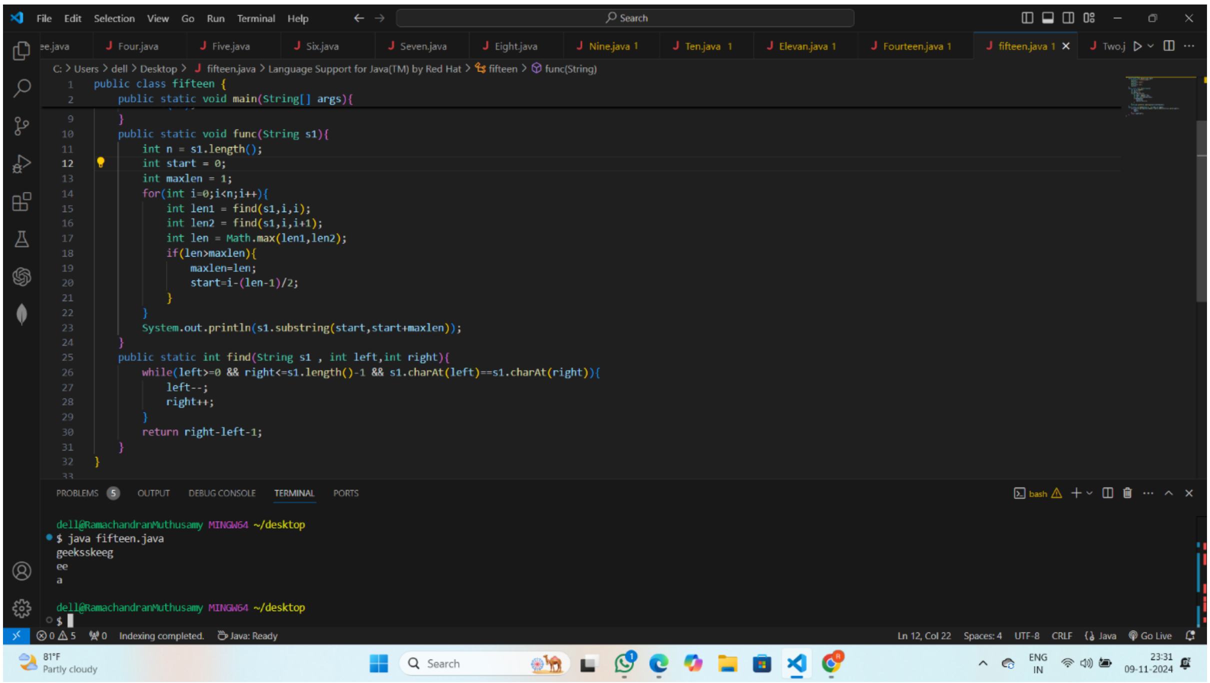


```
public class Fourteen {
    public static void main(String[] args){
        String s3 = "allergic";
        String s4 = "allergy";
        func(s3,s4);
        String s5 = "g";
        String s6 = "g";
        func(s5,s6);
    }
    public static void func(String s1 , String s2){
        Map<Character,Integer> map1 = new HashMap<>();
        Map<Character,Integer> map2 = new HashMap<>();
        boolean status = true;
        if(s1.length()!=s2.length()){
            System.out.println(x:false);
            return;
        }
        for(int i=0;i<s1.length();i++){
            map1.put(s1.charAt(i),map1.getOrDefault(s1.charAt(i),defaultValue:0)+1);
            map2.put(s2.charAt(i),map2.getOrDefault(s2.charAt(i),defaultValue:0)+1);
        }
        for(Map.Entry<Character,Integer> entry : map1.entrySet()){
            Character key1 = entry.getKey();
            int val1 = entry.getValue();
            int val2 = map2.get(key1);
            if(val1!=val2){
                status=false;
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java fourteen.java
true
false
true

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 15:

```
public class fifteen {
    public static void main(String[] args){
        String s1 = "forgeeksskeegfor";
        func(s1);
        String s2 = "geeks";
        func(s2);
        String s3 = "abc";
        func(s3);
    }
    public static void func(String s1){
        int n = s1.length();
        int start = 0;
        int maxlen = 1;
        for(int i=0;i<n;i++){
            int len1 = find(s1,i,i);
            int len2 = find(s1,i,i+1);
            int len = Math.max(len1,len2);
            if(len>maxlen){
                maxlen=len;
                start=i-(len-1)/2;
            }
        }
        System.out.println(s1.substring(start,start+maxlen));
    }
    public static int find(String s1 , int left,int right){
        while(left>=0 && right<=s1.length()-1 && s1.charAt(left)==s1.charAt(right)){
            left--;
            right++;
        }
        return right-left-1;
    }
}
```



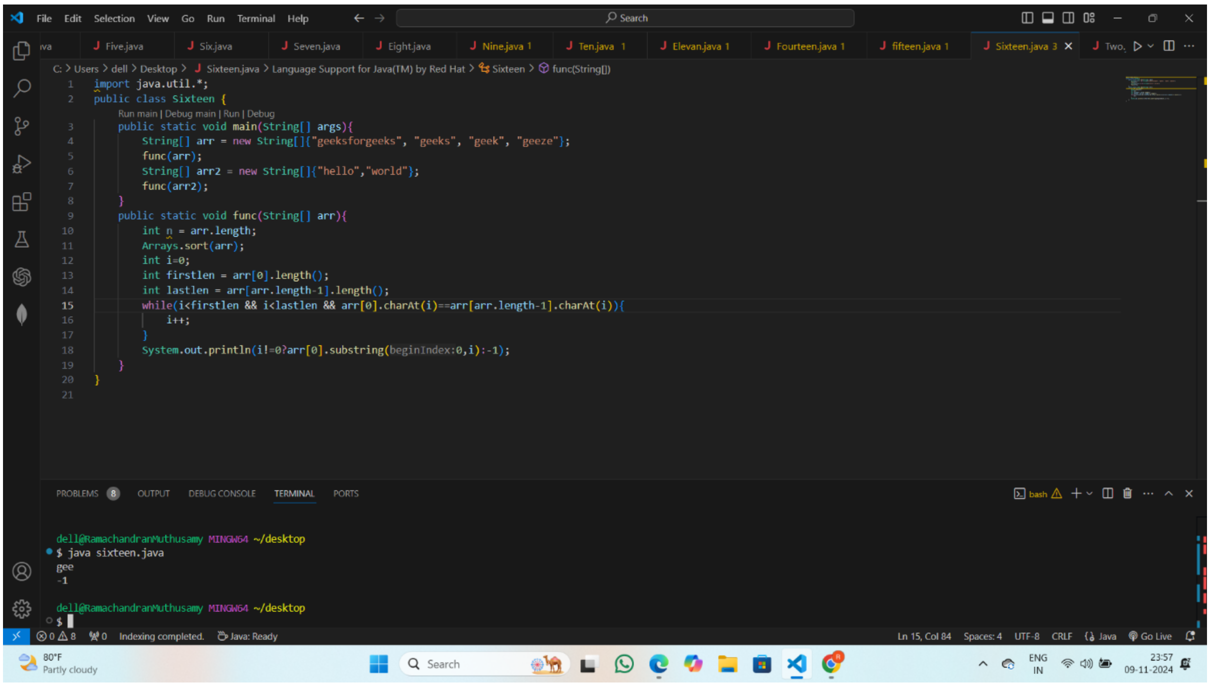
```
public class fifteen {
    public static void main(String[] args){
    }
    public static void func(String s1){
        int n = s1.length();
        int start = 0;
        int maxlen = 1;
        for(int i=0;i<n;i++){
            int len1 = find(s1,i,i);
            int len2 = find(s1,i,i+1);
            int len = Math.max(len1,len2);
            if(len>maxlen){
                maxlen=len;
                start=i-(len-1)/2;
            }
        }
        System.out.println(s1.substring(start,start+maxlen));
    }
    public static int find(String s1 , int left,int right){
        while(left>=0 && right<=s1.length()-1 && s1.charAt(left)==s1.charAt(right)){
            left--;
            right++;
        }
        return right-left-1;
    }
}
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java fifteen.java
geeksskeeg
ee
a

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

File Edit Selection View Go Run Terminal Help
Search
Four.java
Five.java
Six.java
Seven.java
Eight.java
Nine.java
Ten.java
Elevan.java
Fourteen.java
fifteen.java
C: > Users > dell > Desktop > fifteen.java > Language Support for Java(TM) by Red Hat > fifteen > func(String)
PROBLEMS 5
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
bash
0 5 0 Indexing completed. Java: Ready
Ln 12, Col 22 Spaces: 4 UTF-8 CRLF Java Go Live
81°F Partly cloudy
Search
ENG IN
23:31 09-11-2024

## Problem 16:

```
import java.util.*;
public class Sixteen {
    public static void main(String[] args){
        String[] arr = new String[]{"geeksforgeeks", "geeks", "geek", "geeze"};
        func(arr);
        String[] arr2 = new String[]{"hello","world"};
        func(arr2);
    }
    public static void func(String[] arr){
        int n = arr.length;
        Arrays.sort(arr);
        int i=0;
        int firstlen = arr[0].length();
        int lastlen = arr[arr.length-1].length();
        while(i<firstlen && i<lastlen && arr[0].charAt(i)==arr[arr.length-1].charAt(i)){
            i++;
        }
        System.out.println(i!=0?arr[0].substring(0,i):-1);
    }
}
```



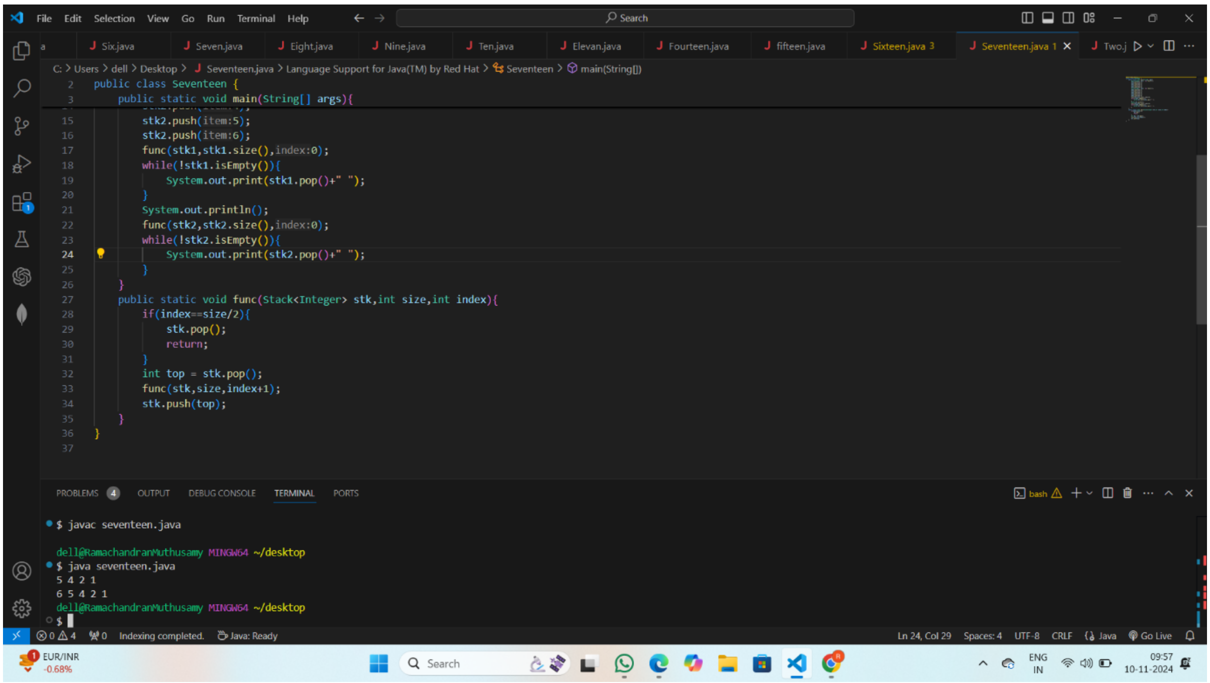
```
import java.util.*;
public class Sixteen {
    public static void main(String[] args){
        String[] arr = new String[]{"geeksforgeeks", "geeks", "geek", "geeze"};
        func(arr);
        String[] arr2 = new String[]{"hello","world"};
        func(arr2);
    }
    public static void func(String[] arr){
        int n = arr.length;
        Arrays.sort(arr);
        int i=0;
        int firstlen = arr[0].length();
        int lastlen = arr[arr.length-1].length();
        while(i<firstlen && i<lastlen && arr[0].charAt(i)==arr[arr.length-1].charAt(i)){
            i++;
        }
        System.out.println(i!=0?arr[0].substring(beginIndex:0,i):-1);
    }
}
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java sixteen.java
gee
-1

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 17:

```
import java.util.*;
public class Seventeen {
    public static void main(String[] args){
        Stack<Integer> stk1 = new Stack<>();
        stk1.push(1);
        stk1.push(2);
        stk1.push(3);
        stk1.push(4);
        stk1.push(5);
        Stack<Integer> stk2 = new Stack<>();
        stk2.push(1);
        stk2.push(2);
        stk2.push(3);
        stk2.push(4);
        stk2.push(5);
        stk2.push(6);
        func(stk1,stk1.size(),0);
        while(!stk1.isEmpty()){
            System.out.print(stk1.pop()+" ");
        }
        System.out.println();
        func(stk2,stk2.size(),0);
        while(!stk2.isEmpty()){
            System.out.print(stk2.pop()+" ");
        }
    }
    public static void func(Stack<Integer> stk,int size,int index){
        if(index==size/2){
            stk.pop();
            return;
        }
        int top = stk.pop();
        func(stk,size,index+1);
        stk.push(top);
    }
```

```
}
```

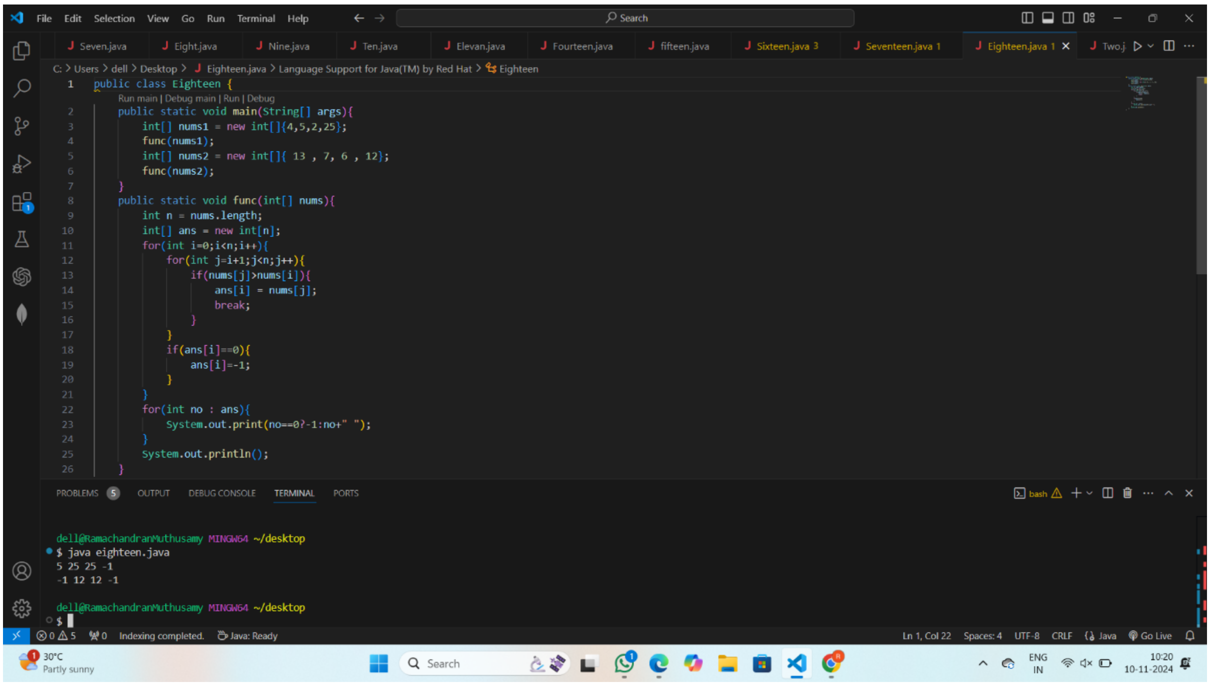


```
public class Seventeen {
    public static void main(String[] args){
        stk2.push(item:5);
        stk2.push(item:6);
        func(stk1,stk1.size(),index:0);
        while(!stk1.isEmpty()){
            System.out.print(stk1.pop()+" ");
        }
        System.out.println();
        func(stk2,stk2.size(),index:0);
        while(!stk2.isEmpty()){
            System.out.print(stk2.pop()+" ");
        }
    }
    public static void func(Stack<Integer> stk,int size,int index){
        if(index==size/2){
            stk.pop();
            return;
        }
        int top = stk.pop();
        func(stk,size,index+1);
        stk.push(top);
    }
}
```

```
$ javac seventeen.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java seventeen.java
5 4 2 1
6 5 4 2 1
dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 18:

```
public class Eighteen {
    public static void main(String[] args){
        int[] nums1 = new int[]{4,5,2,25};
        func(nums1);
        int[] nums2 = new int[]{ 13 , 7, 6 , 12};
        func(nums2);
    }
    public static void func(int[] nums){
        int n = nums.length;
        int[] ans = new int[n];
        for(int i=0;i<n;i++){
            for(int j=i+1;j<n;j++){
                if(nums[j]>nums[i]){
                    ans[i] = nums[j];
                    break;
                }
            }
            if(ans[i]==0){
                ans[i]=-1;
            }
        }
        for(int no : ans){
            System.out.print(no==0?-1:no+" ");
        }
        System.out.println();
    }
}
```

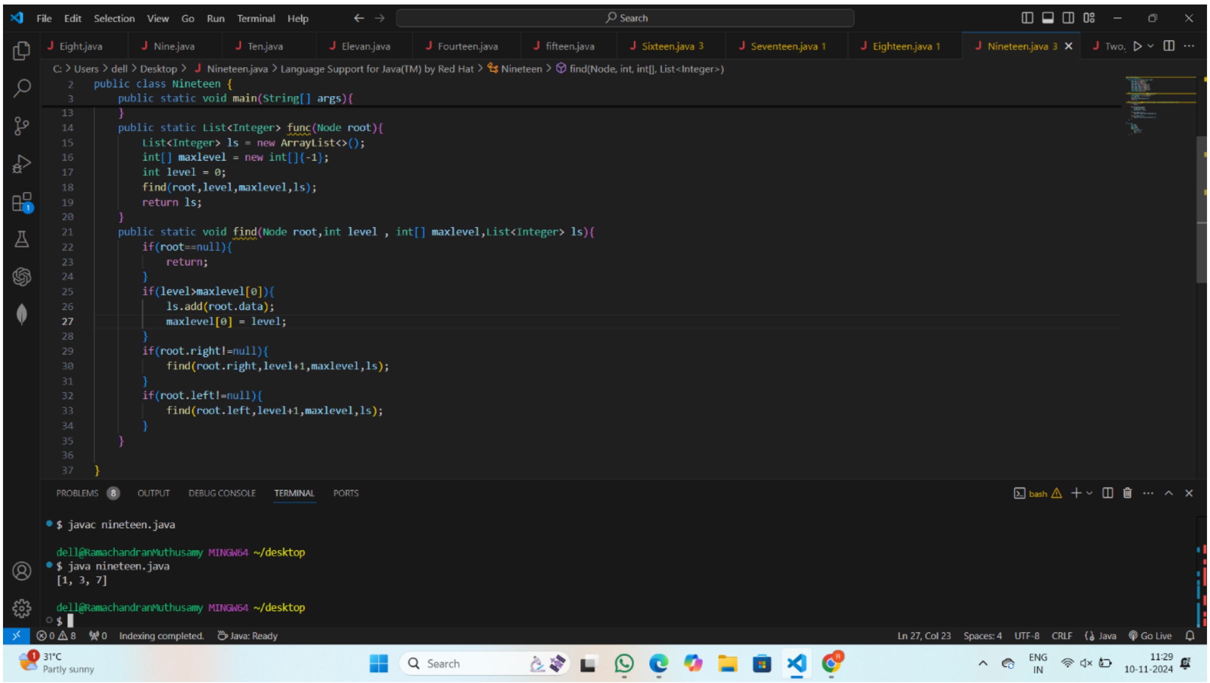


```
public class Eighteen {
    public static void main(String[] args){
        int[] nums1 = new int[]{4,5,2,25};
        func(nums1);
        int[] nums2 = new int[]{ 13 , 7, 6 , 12};
        func(nums2);
    }
    public static void func(int[] nums){
        int n = nums.length;
        int[] ans = new int[n];
        for(int i=0;i<n;i++){
            for(int j=i+1;j<n;j++){
                if(nums[j]>nums[i]){
                    ans[i] = nums[j];
                    break;
                }
            }
            if(ans[i]==0){
                ans[i]=-1;
            }
        }
        for(int no : ans){
            System.out.print(no==0?-1:no+" ");
        }
        System.out.println();
    }
```

```
dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java eighteen.java
5 25 25 -1
-1 12 12 -1

dell@RamachandranMuthusamy MINGW64 ~/desktop
$
```

## Problem 19:

```
import java.util.*;
public class Nineteen {
    public static void main(String[] args){
        Node root = new Node(1);
        root.left=new Node(2);
        root.right=new Node(3);
        root.left.left= new Node(4);
        root.left.right=new Node(5);
        root.right.left=new Node(6);
        root.right.right=new Node(7);
        List<Integer> ans = func(root);
        System.out.println(ans);
    }
    public static List<Integer> func(Node root){
        List<Integer> ls = new ArrayList<>();
        int[] maxlevel = new int[]{-1};
        int level = 0;
        find(root,level,maxlevel,ls);
        return ls;
    }
    public static void find(Node root,int level , int[] maxlevel,List<Integer> ls){
        if(root==null){
            return;
        }
        if(level>maxlevel[0]){
            ls.add(root.data);
            maxlevel[0] = level;
        }
        if(root.right!=null){
            find(root.right,level+1,maxlevel,ls);
        }
        if(root.left!=null){
            find(root.left,level+1,maxlevel,ls);
        }
    }

}
class Node{
        int data;
        Node left;
        Node right;
        Node(int x){
            this.data = x;
            left = null;
            right = null;
        }
    }
```

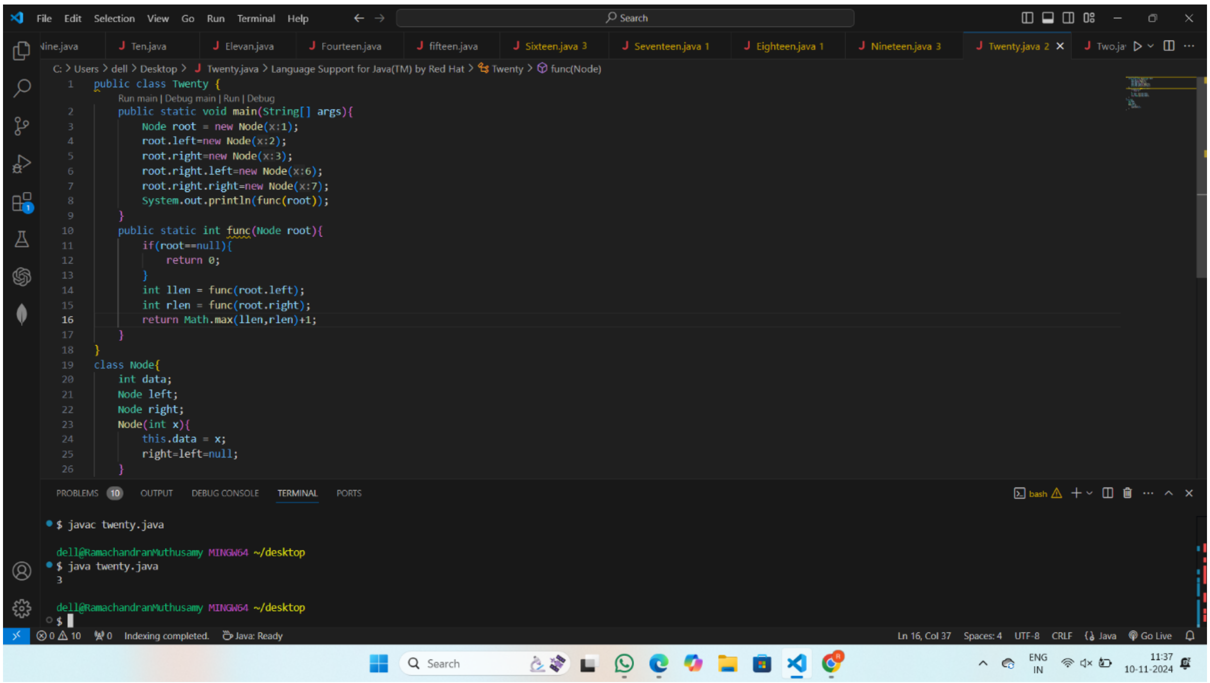


```
public class Nineteen {
    public static void main(String[] args){
    }
    public static List<Integer> func(Node root){
        List<Integer> ls = new ArrayList<>();
        int[] maxlevel = new int[]{-1};
        int level = 0;
        find(root,level,maxlevel,ls);
        return ls;
    }
    public static void find(Node root,int level , int[] maxlevel,List<Integer> ls){
        if(root==null){
            return;
        }
        if(level>maxlevel[0]){
            ls.add(root.data);
            maxlevel[0] = level;
        }
        if(root.right!=null){
            find(root.right,level+1,maxlevel,ls);
        }
        if(root.left!=null){
            find(root.left,level+1,maxlevel,ls);
        }
    }

}
```

```
$ javac nineteen.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java nineteen.java
[1, 3, 7]

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ 
```

## Problem 20:

```
public class Twenty {
    public static void main(String[] args){
        Node root = new Node(1);
        root.left=new Node(2);
        root.right=new Node(3);
        root.right.left=new Node(6);
        root.right.right=new Node(7);
        System.out.println(func(root));
    }
    public static int func(Node root){
        if(root==null){
            return 0;
        }
        int llen = func(root.left);
        int rlen = func(root.right);
        return Math.max(llen,rlen)+1;
    }
}
class Node{
    int data;
    Node left;
    Node right;
    Node(int x){
        this.data = x;
        right=left=null;
    }
}
```



```
public class Twenty {
    public static void main(String[] args){
        Node root = new Node(x:1);
        root.left=new Node(x:2);
        root.right=new Node(x:3);
        root.right.left=new Node(x:6);
        root.right.right=new Node(x:7);
        System.out.println(func(root));
    }
    public static int func(Node root){
        if(root==null){
            return 0;
        }
        int llen = func(root.left);
        int rlen = func(root.right);
        return Math.max(llen,rlen)+1;
    }
}
class Node{
    int data;
    Node left;
    Node right;
    Node(int x){
        this.data = x;
        right=left=null;
    }
```

```
$ javac twenty.java

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ java twenty.java
3

dell@RamachandranMuthusamy MINGW64 ~/desktop
$ 
```