```
//.........................

//Question 1..........

class BinarySearchExample{
 public static void binarySearch(int arr[], int first, int last, int key){
   int mid = (first + last)/2;
   while( first <= last ){
     if ( arr[mid] < key ){
       first = mid + 1;
     }else if ( arr[mid] == key ){
       System.out.println("Element is found at index: " + mid);
       break;
     }else{
       last = mid - 1;
     }
     mid = (first + last)/2;
   }
   if ( first > last ){
     System.out.println("Element is not found!");
   }
 }
 public static void main(String args[]){
      int arr[] = {10,20,30,40,50};
      int key = 30;
      int last=arr.length-1;
      binarySearch(arr,0,last,key);
 }
}

//Output:

Element is found at index: 2

//.........................

//Question 2..........

public class ThirdLargestSecondSmallestExample{
public static int getThirdLargest(int[] a, int total){
int temp;
for (int i = 0; i < total; i++)
     {
        for (int j = i + 1; j < total; j++)
        {
           if (a[i] > a[j])
           {
              temp = a[i];
              a[i] = a[j];
              a[j] = temp;
           }
        }
     }
     return a[total-3];
}
```

```java
 public static int getSecondSmallest(int[] a, int total){
int temp;
for (int i = 0; i < total; i++)
    {
        for (int j = i + 1; j < total; j++)
        {
            if (a[i] > a[j])
            {
                temp = a[i];
                a[i] = a[j];
                a[j] = temp;
            }
        }
    }
    return a[1];
}
public static void main(String args[]){
int a[]={1,2,5,6,3,2};

System.out.println("Third Largest: "+getThirdLargest(a,6));
System.out.println("Second smallest: "+getSecondSmallest(a,6));
}}

//Output:

Third Largest:3
Second smallest: 2

//.........................

//Question 3..........

import java.util.Arrays;
public class MergeArrayExample1
{
public static void main(String[] args)
{
int[] firstArray = {23,45,12,78,4,90,1};
int[] secondArray = {77,11,45,88,32,56,3};
int fal = firstArray.length;
int sal = secondArray.length;
int[] result = new int[fal + sal];
System.arraycopy(firstArray, 0, result, 0, fal);
System.arraycopy(secondArray, 0, result, fal, sal);
System.out.println(Arrays.toString(result));
}
}

//Output:

[23, 45, 12, 78, 4, 90, 1, 77, 11, 45, 88, 32, 56, 3]


//.........................
```

```java
//Question 4..........

public static void main(String []args){
int arr[] = {3,6,10,4,2};
insertionSort(arr);
public static void insertionSort(int []arr){
int key = arr[i];
int j= i-1;
while(j>=0 && arr[j]> key){
arr[j+1] = arr[j];
j--;
}
arr[j+1]=key;
}
for(int i=0; i<arr.length; i++){
System.out.print(arr[i] +" ");
}
}
}

//Output:

2,3,4,6,10

//........................

//Question 5..........

public class Main {

 public static int removeduplicates(int a[], int n)
 {
  if (n == 0 || n == 1) {
   return n;
  }

  // creating another array for only storing
  // the unique elements
  int[] temp = new int[n];
  int j = 0;

  for (int i = 0; i < n - 1; i++) {
   if (a[i] != a[i + 1]) {
    temp[j++] = a[i];
   }
  }

  temp[j++] = a[n - 1];

  // Changing the original array
  for (int i = 0; i < j; i++) {
   a[i] = temp[i];
  }
```

```java
  return j;
 }
 public static void main(String[] args)
 {
  int a[] = { 1, 1, 2, 2, 2 };
  int n = a.length;

  n = removeduplicates(a, n);

  // Printing The array elements
  for (int i = 0; i < n; i++)
   System.out.print(a[i] + " ");
 }
}
```

//Output:

1 2

//.........................

//Question 6..........

```java
import java.util.Arrays;

public class AnagramString {
    static void isAnagram(String str1, String str2) {
        String s1 = str1.replaceAll("\\s", "");
        String s2 = str2.replaceAll("\\s", "");
        boolean status = true;
        if (s1.length() != s2.length()) {
            status = false;
        } else {
            char[] ArrayS1 = s1.toLowerCase().toCharArray();
            char[] ArrayS2 = s2.toLowerCase().toCharArray();
            Arrays.sort(ArrayS1);
            Arrays.sort(ArrayS2);
            status = Arrays.equals(ArrayS1, ArrayS2);
        }
        if (status) {
            System.out.println(s1 + " and " + s2 + " are anagrams");
        } else {
            System.out.println(s1 + " and " + s2 + " are not anagrams");
        }
    }

    public static void main(String[] args) {
        isAnagram("Keep", "Peek");
        isAnagram("Mother In Law", "Hitler Woman");
    }
}
```
//Output:
Keep and Peek are anagrams
MotherInLaw and HitlerWoman are anagrams

```java
//.........................
//Question 7..........

public class OddEvenInArrayExample{
public static void main(String args[]){
int a[]={1,2,5,6,3,2};
System.out.println("Odd Numbers:");
for(int i=0;i<a.length;i++){
if(a[i]%2!=0){
System.out.println(a[i]);
}
}
System.out.println("Even Numbers:");
for(int i=0;i<a.length;i++){
if(a[i]%2==0){
System.out.println(a[i]);
}
}
}}

//Output:

Odd Numbers:
1
5
3
Even Numbers:
2
6
2

//.........................
//Question 8..........

import java.util.Arrays;

public class Exercise7 {

    public static void main(String[] args) {

        int[] my_array = {25, 14, 56, 15, 36, 56, 77, 18, 29, 49};

        System.out.println("Original Array : " + Arrays.toString(my_array));

        int removeIndex = 1;

        for (int i = removeIndex; i < my_array.length - 1; i++) {
            my_array[i] = my_array[i + 1];
        }
```

```
        System.out.println("After removing the second element: " + Arrays.toString(my_array));
    }
}
```

//Output:

Original Array : [25, 14, 56, 15, 36, 56, 77, 18, 29, 49]
After removing the second element: [25, 56, 15, 36, 56, 77, 18, 29, 49, 49]

//........................

//Question 9..........

```
class Insert
{
    public static void main(String[] args)
    {
        int len, p,ele;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter length of an array:");
        len = sc.nextInt();
        int arr[] = new int[len+1];
        System.out.println("Enter "+len+" elements:");
        for(int i = 0; i < len; i++)
        {
            arr[i] = sc.nextInt();
        }
        System.out.print("Enter the element which you want to insert:");
        ele = sc.nextInt();
        arr[len] = ele;
        System.out.print("After inserting : ");
        for(int i = 0; i <len; i++)
        {
            System.out.print(arr[i]+",");
        }
        System.out.print(arr[len]);

    }
}
```

//Output:

Insert an Element in Array - OutputJava
Enter length of an array:4
Enter 4 elements:
1
2
3
4
Enter the element which you want to insert:5
After inserting : 1,2,3,4,5

//........................

```
//Question 10..........

public class MatrixMultiplicationExample{
public static void main(String args[]){

int a[][]={{1,1,1},{2,2,2},{3,3,3}};
int b[][]={{1,1,1},{2,2,2},{3,3,3}};

int c[][]=new int[3][3];

for(int i=0;i<3;i++){
for(int j=0;j<3;j++){
c[i][j]=0;
for(int k=0;k<3;k++)
{
c[i][j]+=a[i][k]*b[k][j];
}
System.out.print(c[i][j]+" ");
}
System.out.println();
}
}}

//Output:
6 6 6
12 12 12
18 18 18
```