1. Write A Java Program for Binary Search Using Array

```
class ExampleBinary{
   static void binarydemo(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("Value found"+mid);
            break;
         }
         else{
            last=mid-1;
         }
         mid=(first+last)/2;
      }
      if(first>last){
         System.out.println("value not found");
      }
   }
   public static void main(String[] args){
      int arr[]={10,30,20,50,60};
      int key=50;
      binarydemo(arr,0,arr.length-1,key);
   }
}
```

2. How To Find Third Largest and Second Smallest Element in An Array

```
class ExampleThirdlarge{
   static void Thirdlarge(int arr[]){
      int max=arr[0];
      int temp=0;
      for (int i = 0; i < arr.length; i++) {
         for (int j = i+1; j < arr.length; j++) {
            if(arr[i] < arr[j]) {
               temp = arr[i];
               arr[i] = arr[j];
               arr[j] = temp;
            }
         }
      }
      System.out.println("Third maximum "+"- "+arr[2]);
      System.out.println("second small "+"- "+arr[arr.length-2]);
      }


   public static void main(String[] args){
      int arr[]={2,5,9,10,1,8};
      Thirdlarge(arr);
   }

   }
```

3. Write A Java Program How to Merge Two Arrays.

```
      import java.util.Arrays;
```

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

                int[] a = { 10, 20, 30, 40 };


                int[] b = { 50, 60, 70, 80 };

                int a1 = a.length;


                int b1 = b.length;

                int c1 = a1 + b1;


                int[] c = new int[c1];


                System.arraycopy(a, 0, c, 0, a1);
                System.arraycopy(b, 0, c, a1, b1);


                System.out.println(Arrays.toString(c));
        }
}
```

4. Write A program to sort an Array Using Insertion Sort.

```
public class ExampleInsertion{
   public static void insertionSort(int array[]) {
      int n = array.length;
      for (int j = 1; j < n; j++) {
         int key = array[j];
         int i = j-1;
         while ( (i > -1) && ( array [i] > key ) ) {
            array [i+1] = array [i];
            i--;
         }
         array[i+1] = key;
      }
   }
```

```
    public static void main(String a[]){
        int[] arr1 = {9,14,3,2,43,11,58,22};
        System.out.println("Before Insertion Sort");
        for(int i:arr1){
            System.out.print(i+" ");
        }
        System.out.println();

        insertionSort(arr1);//sorting array using insertion sort

        System.out.println("After Insertion Sort");
        for(int i:arr1){
            System.out.print(i+" ");
        }
    }
}
```

5. Write A Java Program to Remove Duplicate Elements in an Array.

```
class ExampleDuplicate{
    static void Duplicate(int []arr){
        int temp[]=new int[arr.length];
        int j=0;
        for(int i=0;i<arr.length;i++){
            if(arr[i]!=arr[i+1]){
                temp[j++]=arr[i];

            }
        }
        temp[j++]=arr[arr.length-1];
        for (int i = 0; i < j; i++) {
            arr[i] = temp[i];
        }

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

        int arr[]={1,2,2,3,3,4};
        Duplicate(arr);
    }
}
```

6. How To Check Whether Two String Are Anagram or not.

```
import java.io.*;
import java.util.Arrays;
import java.util.Collections;
class ExampleAnagam
{

	static boolean areAnagram(char[] str1,
                                                        char[] str2)
	{

		int n1 = str1.length;
		int n2 = str2.length;


		if (n1 != n2)
			return false;


		Arrays.sort(str1);
		Arrays.sort(str2);


		for (int i = 0; i < n1; i++)
			if (str1[i] != str2[i])
				return false;

		return true;
	}


	public static void main(String args[])
	{
		char str1[] = {'t', 'e', 's', 't'};
		char str2[] = {'t', 't', 'e', 'w'};

		if (areAnagram(str1, str2))
			System.out.println(
			"The two strings are" +
			" anagram of each other");
		else
			System.out.println(
			"The two strings are not" +
			" anagram of each other");
```

```
        }
}
```

7. Write A Java program To Print Odd and Even Numbers in An Array.

```
public class ExampleOddEven{
   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]);
   }
   }
   }}
```

8. How To Remove Given Element from An Array in Java

```
public class ExampleRemove{
   public static void main(String args[]){
      int[] arr = {1,2,3,4,5,6,7,8,9,10};
                  int removeIndex = 5;
                  for(int i=removeIndex; i<arr.length-1; i++) {
                        arr[i] = arr[i+1];}
                  System.out.println("Array after removing element at index "+removeIndex);
                  for(int i=0; i<arr.length-1; i++) {
                        System.out.print(arr[i]+" ");
      }

   }
}
```

9. Write A Java Program to Insert a New Element into An Array to the Specified Index.

```
import java.util.Arrays;

class ExampleInsertElement
{
```

```
        public static int[] insert(int[] a, int key, int index)
        {
                int[] result = new int[a.length + 1];

                for (int i = 0; i < index; i++) {
                        result[i] = a[i];
                }

                result[index] = key;

                for (int i = index + 1; i <= a.length; i++) {
                        result[i] = a[i - 1];
                }

                return result;
        }

        public static void main(String[] args)
        {
                int[] a = { 1, 2, 4, 5 };
                int key =  3;
                int index = 2;
    System.out.println("Before Insert");
    System.out.println(Arrays.toString(a));
                a = insert(a, key, index);
                System.out.println(Arrays.toString(a));
        }
}
```

10. Write a java Program to multiply two matrices

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

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


   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();
}
}}
```