Class & Object

1. Area of a circle

```
import java.io.*;

class Circle

{

   private double rad,area;

   public void input()throws IOException

   {

         String s;

         BufferedReader b=new BufferedReader(new
InputStreamReader(System.in));

         System.out.println("enter the radius of the circle");

         s=b.readLine();

         rad=Double.parseDouble(s);

   }

   public void calculate()

   {

         area=3.14*Math.pow(rad,2);

   }

   public void display()

   {

         System.out.println("Area of the circle is :: "+area);

   }

}

class CircleMain

{
```

```
    public static void main(String abhi[])throws IOException
    {
          Circle c=new Circle();
          c.input();
          c.calculate();
          c.display();
    }
}
```

2. Binary Search

```
import java.io.*;
class Search
{
    public int search_array(int n,int arr[],int ele)
    {
          int low=0,high=n-1,mid;
          int loc=-1;
          while(low<=high)
          {
                mid=(low+high)/2;
                if(arr[mid]==ele)
                {
                      loc=1;
                      break;
                }
                else if(ele<arr[mid])
                      high=mid-1;
                else
```

```
                    low=mid+1;
            }
            return loc;
      }
}
class BinarySearch
{
   public static void main(String abhi[]) throws IOException
   {
            int loc;
            int i,n,arr[],ele;
            String s;
            BufferedReader b=new BufferedReader(new
InputStreamReader(System.in));
            System.out.println("how many elements you want to enter?");
            s=b.readLine();
            n=Integer.parseInt(s);
            arr=new int [n];
            System.out.println("enter the elements");
            for(i=0;i<n;i++)
            {
                  s=b.readLine();
                  arr[i]=Integer.parseInt(s);
            }
            System.out.println("elements are");
            for(i=0;i<n;i++)
                  System.out.println(arr[i]);
```

```
        System.out.println("enter the element which you want to
search");
        s=b.readLine();
        ele=Integer.parseInt(s);
        Search am=new Search();
        loc=am.search_array(n,arr,ele);
        if(loc!=-1)
              System.out.println("Element is found");
        else
              System.out.println("Element is not found!!!");
   }
}
```

3. Linear Search

```
import java.io.*;
class Search
{
   public int search_array(int n,int arr[],int ele)
   {
        int i,loc=-1;
        for(i=0;i<n;i++)
        {
              if(arr[i]==ele)
              {
                    loc=i;
                    break;
              }
        }
```

```
        return loc;
    }
}
class LinearSearch
{
    public static void main(String abhi[]) throws IOException
    {
        int loc,i,n,arr[],ele;
        String s;
        BufferedReader b=new BufferedReader(new
InputStreamReader(System.in));
        System.out.println("how many elements you want to enter?");
        s=b.readLine();
        n=Integer.parseInt(s);
        arr=new int [n];
        System.out.println("enter the elements");
        for(i=0;i<n;i++)
        {
            s=b.readLine();
            arr[i]=Integer.parseInt(s);
        }
        System.out.println("elements are");
        for(i=0;i<n;i++)
            System.out.println(arr[i]);
        System.out.println("enter the element which you want to
search");
        s=b.readLine();
        ele=Integer.parseInt(s);
```

```
        Search am=new Search();
        loc=am.search_array(n,arr,ele);
        if(loc!=-1)
              System.out.println("Element is found on "+(loc+1)+"
position");
        else
              System.out.println("Element is not found!!!");
   }
}
```

4. Bubble Sort

```
import java.io.*;
class Sort
{
   public void sort_array(int n,int arr[])
   {
        int i,j,temp;
        for(i=0;i<n-1;i++)
        {
              for(j=0;j<n-1-i;j++)
              {
                    if(arr[j]>arr[j+1])
                    {
                          temp=arr[j];
                          arr[j]=arr[j+1];
                          arr[j+1]=temp;
                    }
              }
```

```
        }
    }
}
class BubbleSort
{
    public static void main(String abhi[]) throws IOException
    {
        int n,i,arr[];
        String s;
        BufferedReader b=new BufferedReader(new
InputStreamReader(System.in));
        System.out.println("how many numbers you want to enter");
        s=b.readLine();
        n=Integer.parseInt(s);
        arr=new int [n];
        System.out.println("enter the elements");
        for(i=0;i<n;i++)
        {
            s=b.readLine();
            arr[i]=Integer.parseInt(s);
        }
        System.out.println("before sorting elements are");
        for(i=0;i<n;i++)
            System.out.print(arr[i]+"\t");
        Sort am=new Sort();
        am.sort_array(n,arr);
        System.out.println("\n"+"after sorting elements are");
```

```
        for(i=0;i<n;i++)
              System.out.print(arr[i]+"\t");
    }
}
```

5. Insertion Sort

```
import java.io.*;
class Sort
{
    public void sort_array(int n,int arr[])
    {
        int i,j,x;
        for(i=1;i<n;i++)
        {
            for(j=i-1,x=arr[i];j>=0&&x<arr[j];j--)
            {
                arr[j+1]=arr[j];
            }
            arr[j+1]=x;
        }
    }
}
class InsertionSort
{
    public static void main(String abhi[]) throws IOException
    {
        int n,i,arr[];
        String s;
```

```
        BufferedReader b=new BufferedReader(new
InputStreamReader(System.in));
        System.out.println("how many numbers you want to enter");
        s=b.readLine();
        n=Integer.parseInt(s);
        arr=new int [n];
        System.out.println("enter the elements");
        for(i=0;i<n;i++)
        {
              s=b.readLine();
              arr[i]=Integer.parseInt(s);
        }
        System.out.println("before sorting elements are");
        for(i=0;i<n;i++)
              System.out.print(arr[i]+"\t");
        Sort am=new Sort();
        am.sort_array(n,arr);
        System.out.println("\n"+"after sorting elements are");
        for(i=0;i<n;i++)
              System.out.print(arr[i]+"\t");
   }
}
```