import java.util.\*; // Program to insert,delete,sort,search as per user choice

public class menu\_driven\_SDA // Class Name

{

static Scanner sc = new Scanner(System.in);

int i,j,temp,arr[],arr2[]; // Data Member

public menu\_driven\_SDA(int num) { // Constructor

i=j=temp=0;

arr = new int [num];

arr2 = new int[50];

}

public void elements() { // Method to insert elements to array

System.out.println("Enter the elements: ");

for(i=0;i<arr.length;i++) {

arr[i] = sc.nextInt();

}

}

public int input() { // Method to make choice.

int ch=0; // local variable.

System.out.println("Enter your choice: ");

System.out.println("1 To insert an element into SDA.");

System.out.println("2. To delete an element from SDA. ");

System.out.println("3. To search an element from SDA. ");

System.out.println("4. To sort elemets into SDA. ");

ch = sc.nextInt();

return(ch);

}

public void insert() { // Method to insert a element in the SDA

int i,ele,pos,n=arr.length;

for(i=0;i<arr.length;i++)

arr2[i] = arr[i];

System.out.println("Enter the element to be inserted: ");

ele = sc.nextInt();

System.out.println("Enter the position of insertion: ");

pos = sc.nextInt();

for(i=n-1;i>=pos-1;i--) {

arr2[i+1] = arr2[i];

}

arr2[pos-1] = ele;

System.out.println("Array after Insertion ");

for(i=0;i<arr.length+1;i++) { //Printing of SDA

if(i==arr.length) {

System.out.print(arr2[i]+"");

break;

}

System.out.print(arr2[i]+",");

}

}

public void delete() { // Method to delete a element from the SDA

int pos,i,n=arr.length;

for(i=0;i<n;i++)

arr2[i] = arr[i];

System.out.println("Enter the position to be deleted: ");

pos = sc.nextInt();

for(i=pos;i<n;i++) 1

arr2[i-1] = arr2[i];

n--;

System.out.println("Array after deletion ");

for(i=0;i<arr.length-1;i++) { // Printing of SDA

if(i==arr.length-2) {

System.out.print(arr2[i]+"");

break;

}

System.out.print(arr2[i]+",");

}

}

public void search() {

sort(); // Binary search needs to be sorted before executing.

int k,mid,lb,ub,ns; k=lb=ns=0;

ub = arr.length-1;

System.out.println("Enter the value to be searched using binary search: ");

ns = sc.nextInt();

while(lb<=ub) {

mid = (lb+ub) / 2;

if(arr[mid]<ns) {

lb = mid + 1;

}

if(arr[mid]>ns) {

ub = mid - 1;

}

if(arr[mid]==ns) {

k = 1;

break;

}

}

if(k==1) {

System.out.println("Search Found! ");

} else {

System.out.println("Search Not Found ");

}

}

public void sort() {

for(i=0;i<arr.length-1;i++) { // Bubble Sort Technique

for(j=0;j<arr.length-i-1;j++) {

if(arr[j]>arr[j+1]) {

temp = arr[j];

arr[j] = arr[j+1];

arr[j+1] = temp;

}

}

}

}

public void show() { // Method to show the final output.

for(i=0;i<arr.length;i++) {

if(i==arr.length-1) {

System.out.print(arr[i]+" ");

break;

}

System.out.print(arr[i]+",");

}

}

public void show2() {

for(int i=0;i<arr.length+1;i++) {

if(i==arr.length) {

System.out.print(arr2[i]+"");

break;

}

System.out.print(arr2[i]+",");

}

}

public static void main(String args[]) {

int c=0,sz;

System.out.println("Enter the size of SDA: ");

sz = sc.nextInt();

menu\_driven\_SDA obj = new menu\_driven\_SDA(sz);

obj.elements();

c = obj.input();

switch(c) { // Methods will be called as per the user choice.

case 1: obj.insert();

break;

case 2: obj.delete();

break;

case 3: obj.search();

obj.show();

break;

case 4: obj.sort();

obj.show();

break;

default: System.out.println("Invalid Input! ");

}

}

}