SQA class 7 & 8

interface

interface is nothing but some method but these don't have any definitions. just have some name of function.

- absulate abstraction. its act as abstraction . but abstraction doesn't need to fill all function bt interference have to fill all function.
- interfarence er object nai. but j j code intefarence er jinish pati use korbe tader ta dhorte parbe.
- jemon onplus and samgsung use korse interfarence1 er jinish pati .
- so , home code e interfarence knock dile tar nijer object na thkleo oneplus er jinish dhorte parbe

parents code

```
package interfarences;

public interface intterface1 {
        public String processor();
        public String OS();
        public String SpaceInGB();

}
```

child code:

```
package interfarences;

public class oneplus implements intterface1{
    @Override
    public String processor() {
        return "SD833";
    }
    public String OS(){
        String s = "MAC os";
        return s;
        //System.out.println("vlo phone");
    }

    @Override
    public String SpaceInGB() {
        return "15 GB";
    }

}
```

child code:

```
package interfarences;

public class samgsung implements intterface1{

    @Override
    public String processor() {
        return "SD833";
    }

    @Override
    public String OS() {
        System.out.println("vlo phone motamuti");
       return "Oxygen";
    }

    @Override
    public String SpaceInGB() {
        return "15 GB";
```

```
    }
}
```

home code:

```
package interfarences;

public class home {
    public static void main(String[] args) {
        oneplus one = new oneplus();
        one.OS();
        intterface1 phn = new oneplus();
        String txt = phn.OS();
        System.out.println(txt);
        intterface1 sphn = new samgsung();
        sphn.OS();
    }
}
```

output:

```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.2\lib\
MAC os
vlo phone motamuti

Process finished with exit code 0
```

Bubble sort:

```
package bobble;

import java.util.Arrays;
import java.util.Scanner;

public class Bubblesortexample {
    public void bubbleSort(int[] ary){
        int n = ary.length;
        int temp = 0;
        for (int i=0; i<n; i++){
            for (int j = 1; j<(n-i); j++){
                if(ary[j-1]>ary[j]){
                    temp = ary[j];
                    ary[j] = ary[j-1];
                    ary[j-1] =temp;
                }
            }
        }
        System.out.println("the  rearrange array is : " + Arrays.toString(ary));
    }

    public static void main(String[] args) {
        Bubblesortexample bb = new Bubblesortexample();
        Scanner sc = new Scanner(System.in);
        System.out.println(" input the range of your array:");
        int n = sc.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = sc.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        bb.bubbleSort(array);
    }
}
```

output:

```
"C:\Program Files\Java\jdk1.8.0_181\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.1.2\lib\
 input the range of your array:
5
```

```
input the value for 0 :
5
input the value for 1 :
7
input the value for 2 :
8
input the value for 3 :
4
input the value for 4 :
6
the array is : [5, 7, 8, 4, 6]
the  rearrange array is : [4, 5, 6, 7, 8]

Process finished with exit code 0
```

homework:

if there any double value then remove it and make it zero less:

```
package bobble;

import java.util.Arrays;
import java.util.Scanner;

public class Bubblesortexample {
    public int[] bubbleSort(int[] ary){ //unorganised array is being organised
        int n = ary.length;
        int temp = 0;
        for (int i = 0; i < n; i++){
            for (int j = 1; j < (n - i); j++){
                if (ary[j - 1] > ary[j]){
                    temp = ary[j];
                    ary[j] = ary[j - 1];
                    ary[j - 1] = temp;
                }
            }
        }
        System.out.println("The rearranged array is: " + Arrays.toString(ary));
        return ary;
    }
    public int[] bubbleultraSort(int[] ary){ //finfing out double value from the organised array
        int m = ary.length;
        int j = 1;
        int[] ar = new int[m];
        for (int i = 1; i<=m && j<=m ;i++) {
            boolean ifequal = (j<m && ary[j - 1] == ary[j]) ;
            if (ifequal) {
                i--;
            }
            else {
                ar[i-1]=ary[j-1]; // removing the double value from the array
            }
            j++;
        }  // now array is complete without double value and have some 0 in the last
        int p = 0;
        int k = ar.length;
        for (int i = 1; i<k;i++){ //finding out the number of zeros
            if ( ary[i-1] == ary[i]){
                p++; // store here the total zeros
            }
        }
        int h = ar.length-p;
        int[] array = new int[h];
        for(int i =0; i<=h; i++ ){
            if(ar[i] != 0){
               array[i]=ar[i];  // removing the 0 and a new array is making without zero
            }
        }
        return array;       // final array which is organised and without any zeros
        }
    public static void main(String[] args) {
        Bubblesortexample bb = new Bubblesortexample();
        Scanner sc = new Scanner(System.in);
        System.out.println("Input the range of your array:");
        int n = sc.nextInt();
        int[] array = new int[n];
        for (int x = 0; x < n; x++){
            System.out.println("Input the value for " + (x+1) + ":");
            int p = sc.nextInt();
```

```
            array[x] = p;
        }
        System.out.println("The array is: " + Arrays.toString(array));
        int[] a =  bb.bubbleSort(array);
        int [] b=bb.bubbleultraSort(a);
        System.out.println("The final array is: " + Arrays.toString(b));
    }
}
```

output:

```
Input the range of your array:
5
Input the value for 1:
5
Input the value for 2:
2
Input the value for 3:
6
Input the value for 4:
8
Input the value for 5:
8
The array is: [5, 2, 6, 8, 8]
The rearranged array is: [2, 5, 6, 8, 8]
The final array is: [2, 5, 6, 8]

Process finished with exit code 0
```

MAP:

- map is a collection of key of value pair
- lets have a array 56, 87, 78, 25. here
- if we have the array value num:

cell number	value
0	56
1	87
2	78
3	25

but if we want to give any name of this cell that is call key.. and this in known as MAP.

key	value
anik	56
syem	87
tomu	78
rony	25

this is mapping…..

```
package Practice_problem_2;

import java.util.Arrays;
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;

public class FrequencyOfElements {
    public void frequency(int [] array){
        Map<Integer, Integer> freq = new HashMap<>();
        for (int element : array) {
            if (freq.containsKey(element)) {
                freq.put(element, freq.get(element) + 1);
            } else {
```

```
                freq.put(element, 1);
            }
        }

        // Print the frequency of each element.
        System.out.println("The frequency of each element is:");
        for (Map.Entry<Integer, Integer> entry : freq.entrySet()) {
            System.out.println(entry.getKey() + " : " + entry.getValue());
        }
    }

    public static void main(String[] args) {
        FrequencyOfElements fe = new FrequencyOfElements();
        Scanner ss = new Scanner(System.in);
        System.out.println("input the range of your array:");
        int n = ss.nextInt();
        int [] array = new int[n];
        for (int x = 0 ; x<=n-1; x++){
            System.out.println("input the value for " + x + " :");
            int p = ss.nextInt();
            array[x]=p;
        }
        System.out.println("the array is : " + Arrays.toString(array));
        fe.frequency(array);
    }
}
```

hashmap:

2ta jinish key & vlaue

.put diye input nya hy