(day-16 assignment, below 3 questions)

1. Write a program to take an integer array from the user and give the user a choice to sort using bubble sort (or) selection sort. Sort the array elements according to the selected algorithm of the user and display the sorted array.

//code

```
import java.util.Scanner;

public class SBA4_1 {
   //*****BUBBLE SORT************
   void bubbleSort(int arr[])
   {
       int n = arr.length;
       for (int i = 0; i < n-1; i++)
           for (int j = 0; j < n-i-1; j++)
           {
               if (arr[j] > arr[j+1])
               {
                   // swap arr[j+1] and arr[j]
                   int temp = arr[j];
                   arr[j] = arr[j+1];
                   arr[j+1] = temp;
               }
               //for debugging every move made by the algorithm
           /*for (int k=0; k<n; ++k)
           {
              System.out.print(arr[k]+",");
           }
              System.out.println("");*/
           }//inner for closes
   }

   /* Prints the array */
   void printArray(int arr[])
   {
       int n = arr.length;
       for (int i=0; i<n; ++i)
           System.out.print(arr[i] + " ");
       System.out.println();
   }

   //********SELECTION SORT**************
   void Selectionsort(int arr[])
   {
       int n = arr.length; //6
       for (int i = 0; i < n-1; i++)
       {
           int min_idx = i;//
           for (int j = i+1; j < n; j++)
           {
               if (arr[min_idx] > arr[j])
                   min_idx = j;//5
           }
```

```
            int temp = arr[min_idx];
            arr[min_idx] = arr[i];
            arr[i] = temp;
         /*for (int k=0; k<n; ++k)
         {
            System.out.print(arr[k]+" ");
         }
         System.out.println();  */
        }
    }
    // Prints the array
    void printArray2(int arr[])
    {
        int n = arr.length;
        for (int i=0; i<n; ++i)
            System.out.print(arr[i]+" ");
        System.out.println();
    }
    //****MAIN CLASS*********
    public static void main(String[] args) {
        //int arr[] = {64, 34, 25, 12, 22, 11, 90};
        int[] arr=new int[5];
        System.out.println("Enter 5 integer values");
        Scanner sc=new Scanner(System.in);
        for(int i=0;i<5;i++)
        {
            arr[i]=sc.nextInt();
        }

        System.out.print("Unsorted Array is : [");
        for(int i=0;i<5;i++)
        {
            System.out.print(arr[i]+",");
        }
        System.out.println("]");
        SBA4_1 ob = new SBA4_1();
        System.out.println("Enter 1:Bubble Sort 2:Selection Sort");
        int n=sc.nextInt();
        switch(n)
        {
            case 1:{

                ob.bubbleSort(arr);
                System.out.println("Sorted array");
                ob.printArray(arr);
                break;
            }
            case 2:{
                ob.Selectionsort(arr);
                System.out.println("Sorted array");
                ob.printArray2(arr);
                break;
            }
        }

    }
}
```

//output

```
"C:\Users\Castro K Joseph\.jdks\openjdk-17.0.2\bin\java.exe" "-javaa
 2021.3.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\Castro K J
Enter 5 integer values
5 85 4 6 1
Unsorted Array is : [5,85,4,6,1,]
Enter 1:Bubble Sort 2:Selection Sort
1
Sorted array
1 4 5 6 85

Process finished with exit code 0
```

```
"C:\Users\Castro K Joseph\.jdks\openjdk-17.0.2\bin\java.exe" "-javaagent:C:\P
 2021.3.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\Castro K Joseph\Ide
Enter 5 integer values
2 8 6 9 5
Unsorted Array is : [2,8,6,9,5,]
Enter 1:Bubble Sort 2:Selection Sort
2
Sorted array
2 5 6 8 9

Process finished with exit code 0
```

2. Write a program to implement insertion sort.

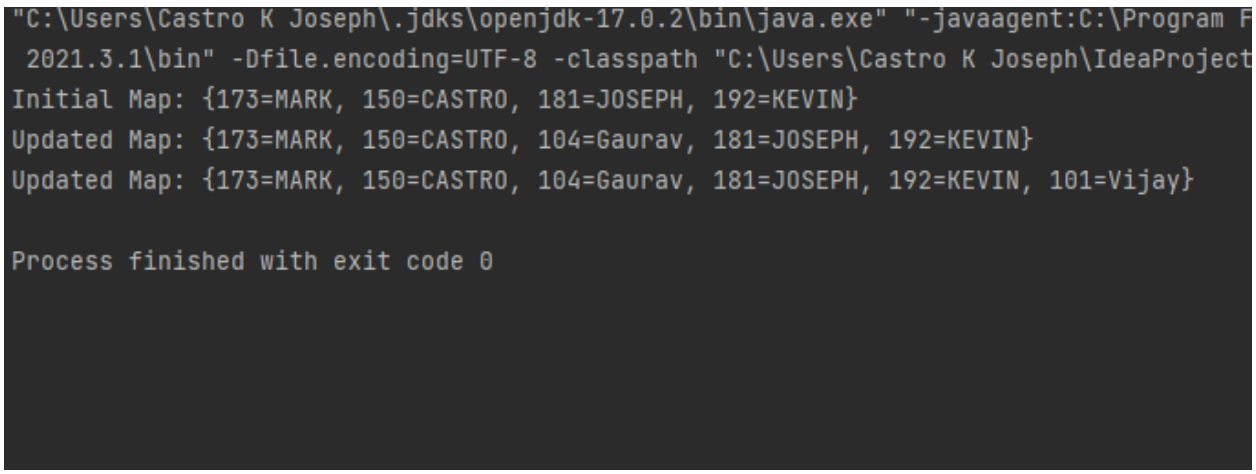
Already done in SBA3 question 5

3. write a program to implement Hashtable and add atleast 4 values into it, implement the putIfAbsent() method.

//CODE

```
import java.util.*;
class SBA4_3{
   public static void main(String args[]){
        Hashtable<Integer,String> map=new Hashtable<Integer,String>();
        map.put(150,"CASTRO");
        map.put(192,"KEVIN");
        map.put(181,"JOSEPH");
        map.put(173,"MARK");
        System.out.println("Initial Map: "+map);
        //Inserts, as the specified pair is unique
        map.putIfAbsent(104,"Gaurav");
        System.out.println("Updated Map: "+map);
        //Returns the current value, as the specified pair already exist
        map.putIfAbsent(101,"Vijay");
        System.out.println("Updated Map: "+map);
   }
}
```

//OUTPUT



4. Create a class of Books with attributes:
a)id
b)name
c)author
d)publisher
e)quantity sold.

Implement a Hashtable to implement the objects of Books type. Print all the details of books by traversing through the Hashtable.

//CODE

```
import java.util.Hashtable;
import java.util.Map;

class Book {
   int id;
   String name,author,publisher;
   int quantity;
   public Book(int id, String name, String author, String publisher, int
quantity) {
       this.id = id;
       this.name = name;
       this.author = author;
       this.publisher = publisher;
       this.quantity = quantity;
   }
}
public class SBA4_4 {
   public static void main(String[] args) {
       //Creating map of Books
       Map<Integer,Book> map=new Hashtable<Integer,Book>();
       //Creating Books
       Book b1=new Book(101,"Let us C","Yashwant Kanetkar","BPB",8);
       Book b2=new Book(102,"Data Communications & Networking","Forouzan","Mc
Graw Hill",4);
       Book b3=new Book(103,"Operating System","Galvin","Wiley",6);
       //Adding Books to map
       map.put(1,b1);
       map.put(2,b2);
       map.put(3,b3);
       //Traversing map
       for(Map.Entry<Integer, Book> entry:map.entrySet()){
           int key=entry.getKey();
           Book b=entry.getValue();
           System.out.println(key+" Details:");
           System.out.println(b.id+" "+b.name+" "+b.author+" "+b.publisher+"
"+b.quantity);
       }
   }
}
```

//OUPTPUT

```
"C:\Users\Castro K Joseph\.jdks\openjdk-17.0.2\bin\java.exe" "-javaagent:C
 2021.3.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\Castro K Joseph\
3 Details:
103 Operating System Galvin Wiley 6
2 Details:
102 Data Communications & Networking Forouzan Mc Graw Hill 4
1 Details:
101 Let us C Yashwant Kanetkar BPB 8

Process finished with exit code 0
```