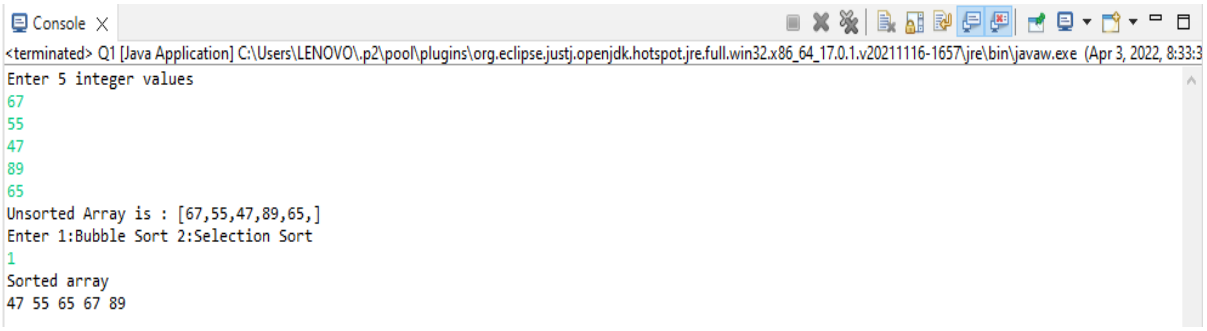
(day-16 assignment, below 3 questions)

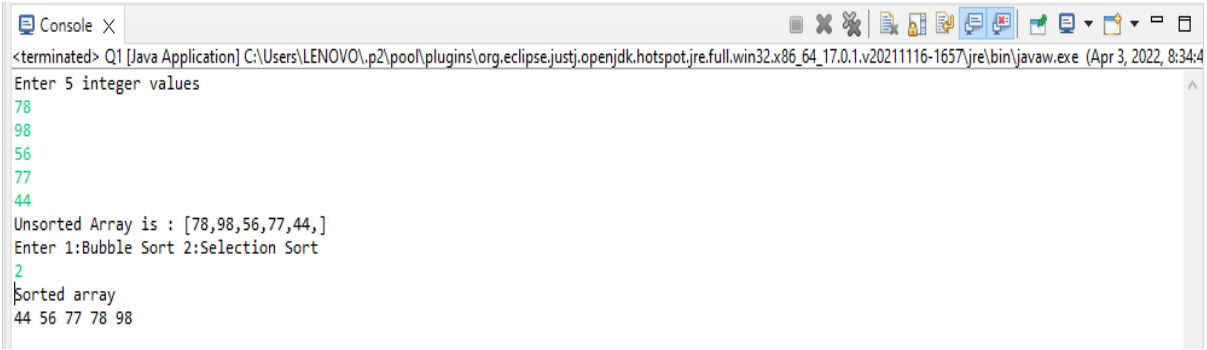
1. Write a program to take an integer array from the user and give the user a choice to sort using bubble sort (or) selection sort. Sort the array elements according to the selected algorithm of the user and display the sorted array.

```
package SBA_4;

import java.util.Scanner;

public class Q1 {
	//*****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("]");
                Q1 ob = new Q1();
                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;
                }
                }

        }
}
```

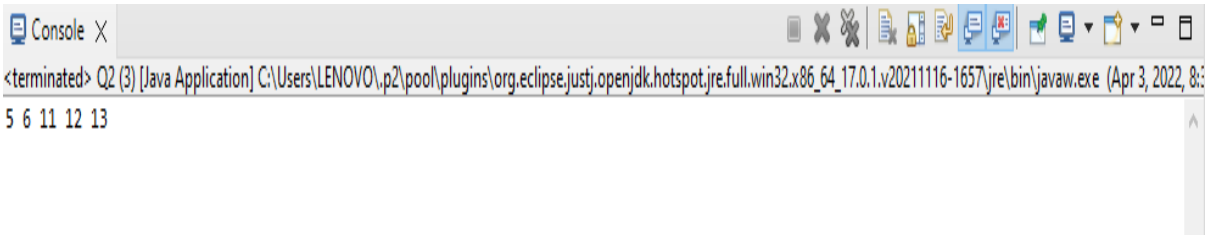




2. Write a program to implement insertion sort.

```
//Write a program to implement insertion sort.
package SBA_4;

public class Q2 {
	void sort(int arr[])
	 {
	    int n = arr.length;
	    for (int i = 1; i < n; ++i) {
	       int key = arr[i];
	       int j = i - 1;

	       /* Move elements of arr[0..i-1], that are
	          greater than key, to one position ahead
	          of their current position */
	       while (j >= 0 && arr[j] > key) {
	          arr[j + 1] = arr[j];
	          j = j - 1;
	       }
	       arr[j + 1] = key;
	    }
	 }
```

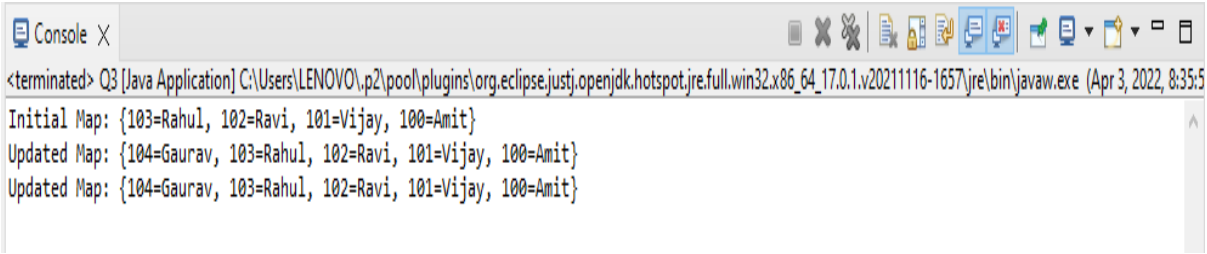
```
        /* A utility function to print array of size n*/
        static void printArray(int arr[])
        {
            int n = arr.length;
            for (int i = 0; i < n; ++i)
                System.out.print(arr[i] + " ");

            System.out.println();
        }

        // Driver method
        public static void main(String args[])
        {
            int arr[] = { 12, 11, 13, 5, 6 };

            Q2 ob = new Q2();
            ob.sort(arr);

            printArray(arr);
        }
}
```



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

```
//Write a program to implement Hashtable and add atleast 4 values into it, implement the putIfAbsent() method.
package SBA_4;

import java.util.*;
class Q3{
 public static void main(String args[]){
```

```
    Hashtable<Integer,String> map=new Hashtable<Integer,String>();
     map.put(100,"Amit");
     map.put(102,"Ravi");
     map.put(101,"Vijay");
     map.put(103,"Rahul");
     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);
 }
}
```



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.

```
   package SBA_4;

   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 Q4 {
    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);
       }
    }
}
```