**NIGER DELTA UNIVERSITY,**

***WILBERFORCE ISLAND, AMASSOMA BAYELSA STATE***

***P.M.B. 71***

**DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE**

**CMP 421 ALGORITHM ASSIGNMENT 1**

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**QUESTION SOLUTION**

**Bubble Sort in java without stopping**

class BubbleSort

{

    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;

                }

    }

    /\* 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();

    }

    // Driver method to test above

    public static void main(String args[])

{

        BubbleSort ob = new BubbleSort();

        int arr[] = {64, 34, 25, 12, 22, 11, 90};

        ob.bubbleSort(arr);

        System.out.println("Sorted array");

        ob.printArray(arr);

    }

}

or

**Bubble sort with stopping**

class BubbleSort {

 void bubbleSort(int arr[]) {   //sorting method

   int size = arr.length;

   for (int i = 0; i < size - 1; i++) {

     boolean flag = true;

     for (int j = 0; j < size - i - 1; j++) {

       if (arr[j] > arr[j + 1]) {

         int temp = arr[j];

         arr[j] = arr[j + 1];

         arr[j + 1] = temp;

         flag = false;

       }

     }

     if (flag == true)

       break;

   }

 }

void display(int arr[]) {   //method for displaying the elements

    int size = arr.length;

​ for (int i = 0; i < size; i++)

​System.out.println(arr[i]+" ");​

  }

 public static void main(String args[]) {   //main method or driver method

   int[] arr = { -2, 45, 0, 11, -9 };

   BubbleSort  bs = new BubbleSort();

   System.out.println("Elements before Sorting:");

   bs.display(arr);

   bs.bubbleSort(arr);

   System.out.println("Elements after Sorting:");

   bs.display(arr);

 }

}

**Insertion Sort in java**

import java.util.\*;

class InsertionSort {

   //method for sorting the elements

   void insertionSort(int arr[]) {

       int size = arr.length;

       for (int i = 1; i < size; i++) {

           int tmp = arr[i];

           int j = i - 1;

           while (j >= 0 && tmp < arr[j]) {

               arr[j + 1] = arr[j];

               --j;

               }

               arr[j + 1] = tmp;

               }

               } ​

               // method for printing the elements

               void display(int arr[]) {

                   int size = arr.length;

                   for (int i = 0; i < size; i++) ​

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

                   System.out.println();

               } // Main method or driver method

               public static void main(String args[]) {

                   int[] arr = { 9, 5, 1, 4, 3 };

                   InsertionSort  ob = new InsertionSort();

                   System.out.println("Elements before sorting: ");

                   ob.display(arr);

                   ob.insertionSort(arr);

                   System.out.println("Elements after sorting: ");

                   ob.display(arr);

                   }

}

//Output of the program: Elements before sorting: 9 5 1 4 3 Elements after sorting: 1 3 4 5 9