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COURSE CODE:	CMP 421
COURSE TITLE:	ALGORITHM

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
```