



COLLEGE OF ENGINEERING AND COMPUTER STUDIES

**OUTCOMES EVALUATION #2**  
**DSA – Data Structure and Algorithm**

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Course & Section  
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## OUTCOMES OUTLINE

### I. INTRODUCTION

#### A. Description

Implementation of bubble sort and insertion sort in Java programming language.

#### B. Objectives

Print the number of iterations bubble and insertion after the unordered array is sorted.

The unordered array values must be user entered.

### II. CONCEPTUAL FRAMEWORK

INPUT	PROCESS	OUTPUT
The user will input a selection of lists for the array.	All data input asserts variables and makes them usable in the output.	The program will show the lists of the output given by the user.

### III. RESULTS AND DISCUSSION (Screenshots-I/O and brief discussions)

```
Enter the size of the array: 6
You've enter 6 of your choice
Enter the index [0] number :49
Enter the index [1] number :8
Enter the index [2] number :63
Enter the index [3] number :25
Enter the index [4] number :33
Enter the index [5] number :19
```

```
[1] for Bubble Sort.
[2] for Insertion Sort.
Enter your choice: 1
Final Sorted array:
8 19 25 33 49 63
Number of iterations: 15
```



```
Enter the size of the array: 5
You've enter 5 of your choice
Enter the index [0] number :30
Enter the index [1] number :5
Enter the index [2] number :18
Enter the index [3] number :24
Enter the index [4] number :1
```

```
[1] for Bubble Sort.
[2] for Insertion Sort.
Enter your choice: 2
Final Sorted array:
1 5 18 24 30
Number of iterations: 7
```

#### IV. PROGRAM SOURCE CODE

```
import java.util.Scanner;
public class OE2 {
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter the size of the array: ");
        int n = scan.nextInt();
        int[] array = new int[n];
        System.out.println("You've enter " + n + " of your choice");
        for (int i = 0; i < n; i++) {
            System.out.print("Enter the index [" + i + "] number :");
            array[i] = scan.nextInt();
        }
        do {
            System.out.println(" ");
            System.out.println("[1] for Bubble Sort.");
            System.out.println("[2] for Insertion Sort.");
            System.out.print("Enter your choice: ");
            int sort = scan.nextInt();
            switch (sort) {
                case 1:
                    bubbleS(array);
                    break;
                case 2:
                    insertionS(array);
                    break;
                default:
                    System.out.println("Invalid choice");
            }
        } while (true);
    }
}
```



```
public static void bubbleS(int[] arr) {
    int n = arr.length;
    int iteration = 0;

    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j++) {
            if (arr[j] > arr[j + 1]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
            }
            iteration++;
        }
    }

    System.out.println("Final Sorted array: ");
    for (int i = 0; i < n; i++) {
        System.out.print(arr[i] + " ");
    }
    System.out.println("\nNumber of iterations: " + iteration);
}

public static void insertionS(int[] arr) {
    int n = arr.length;
    int iteration = 0;
    for (int i = 1; i < n; i++) {
        int key = arr[i];
        int j = i - 1;

        while (j >= 0 && arr[j] > key) {
            arr[j + 1] = arr[j];
            j = j - 1;
            iteration++;
        }
        arr[j + 1] = key;
    }
    System.out.println("Final Sorted array: ");
    for (int i = 0; i < n; i++) {
        System.out.print(arr[i] + " ");
    }
    System.out.println("\nNumber of iterations: " + iteration);
}
}
```

## V. LEARNING OUTCOMES



**As every lesson is the learning outcome. Many errors but managed to conquer them. Learning programming takes time, you wouldn't master it in a single day but it will when the time comes.**

**VI. GITHUB ACTIVITY LINK**

**<https://github.com/Jusephz/Data-Structures.git>**

**VII. REFERENCES**

**Lesson 3: Bubble Sort and Insertion Sort**