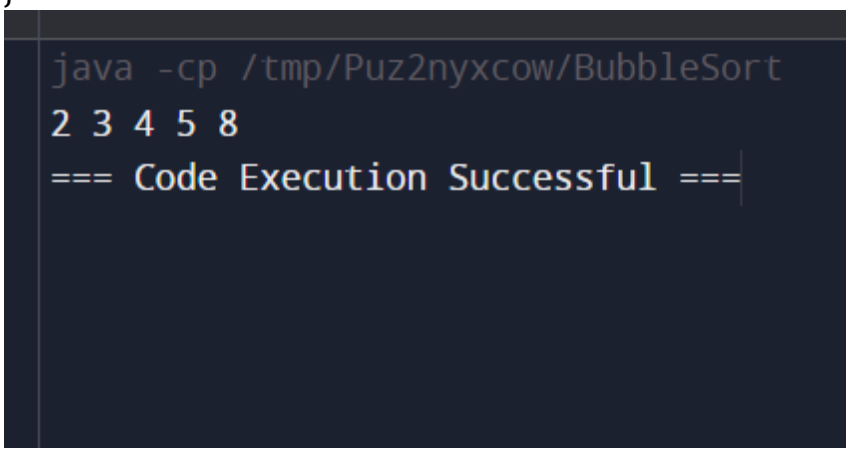
1.create a bubble sort

```
public class BubbleSort {
    public static void main(String[] args) {
        int[] arr = {5, 3, 8, 4, 2};
        bubbleSort(arr);
        for (int num : arr) System.out.print(num + " ");
    }
    private static void bubbleSort(int[] arr) {
        for (int i = 0; i < arr.length - 1; i++)
            for (int j = 0; j < arr.length - 1 - i; j++)
                if (arr[j] > arr[j + 1]) {
                    int temp = arr[j];
                    arr[j] = arr[j + 1];
                    arr[j + 1] = temp;
                }
    }
}
```



2.create selection sort

```
public class SelectionSort {
    public static void main(String[] args) {
        int[] arr = {5,7,10,9,6};
        selectionSort(arr);
        for (int num : arr) System.out.print(num + " ");
    }
    private static void selectionSort(int[] arr) {
        for (int i = 0; i < arr.length; i++) {
            int minIndex = i;
            for (int j = i + 1; j < arr.length; j++)
                if (arr[j] < arr[minIndex]) minIndex = j;
            int temp = arr[i];
            arr[i] = arr[minIndex];
            arr[minIndex] = temp;
        }
    }
}
```

```
java -cp /tmp/tDffv8xliO/SelectionSort
5 6 7 9 10
=== Code Execution Successful ===
```

3.create binary search

```
public class BinarySearch {
    public static void main(String[] args) {
        int[] arr = {1, 2, 3, 4, 5, 6};
        int target = 3;
        int index = binarySearch(arr, target);
        System.out.println("Index of " + target + ": " + index);
    }
    private static int binarySearch(int[] arr, int target) {
        int left = 0, right = arr.length - 1;
        while (left <= right) {
            int mid = left + (right - left) / 2;
            if (arr[mid] == target) return mid;
            if (arr[mid] < target) left = mid + 1;
            else right = mid - 1;
        }
        return -1;
    }
}
```

```
Index of 3: 2

=== Code Execution Successful ===
```

4.create linear search

```
public class SequentialSearch {
    public static void main(String[] args) {
        int[] arr = {5, 3, 8, 4, 2};
```

```
        int target = 4;
        int index = sequentialSearch(arr, target);
        System.out.println("Index of " + target + ": " + index);
    }

    private static int sequentialSearch(int[] arr, int target) {
        for (int i = 0; i < arr.length; i++) {
            if (arr[i] == target) return i;
        }
        return -1; // Target not found
    }
}
```