Day 16 – 11/07/2025

Q1. Write an algorithm/step for selection sort.  
Ans.

Selection Sort Algorithm

1. Start with the first element: Consider the first element of the array as the minimum value.
2. Compare with remaining elements: Compare the current minimum value with the remaining elements in the array.
3. Find the minimum value: If a smaller value is found, update the minimum value and its index.
4. Swap the minimum value: After comparing all elements, swap the minimum value with the current element.
5. Repeat the process: Repeat steps 1-4 for the remaining unsorted elements in the array.

Q2. Write pseudocode for selection sort.  
Ans. code –

FOR i FROM 0 TO n-2

minIndex = i

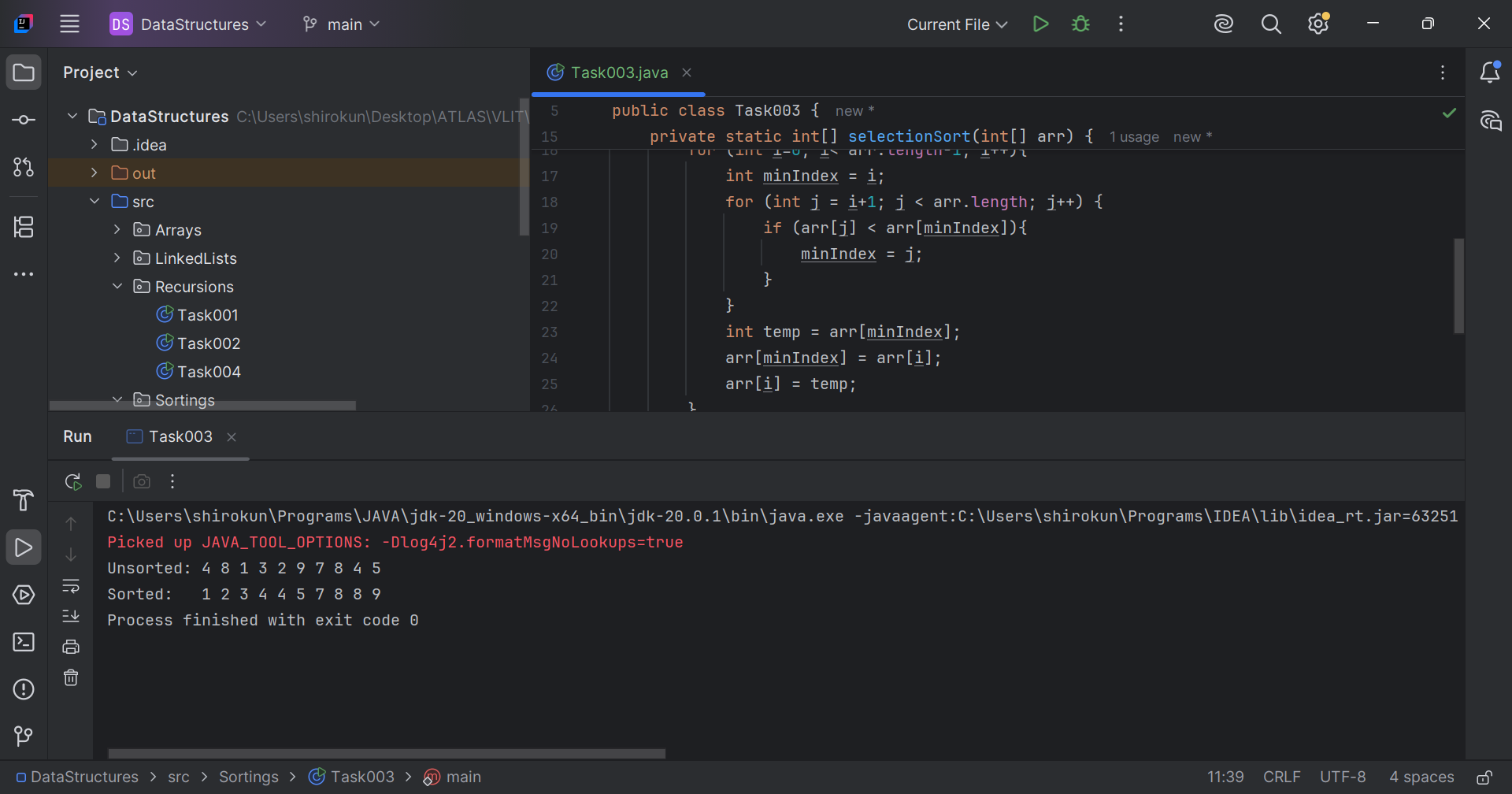
FOR j FROM i+1 TO n-1

IF arr[j] < arr[minIndex]

minIndex = j

SWAP arr[i] WITH arr[minIndex]

// Task003: Selection sort  
  
package Sortings;  
  
public class Task003 {  
 public static void main(String[] args) {  
 int[] sortArr, arr = {4, 8, 1, 3, 2, 9, 7, 8, 4, 5};  
 System.*out*.print("Unsorted: ");  
 for (int a: arr) System.*out*.print(a+" ");  
 sortArr = *selectionSort*(arr);  
 System.*out*.print("\nSorted: ");  
 for (int a: sortArr) System.*out*.print(a+" ");  
 }  
  
 private static int[] selectionSort(int[] arr) {  
 for (int i=0; i< arr.length-1; i++){  
 int minIndex = i;  
 for (int j = i+1; j < arr.length; j++) {  
 if (arr[j] < arr[minIndex]){  
 minIndex = j;  
 }  
 }  
 int temp = arr[minIndex];  
 arr[minIndex] = arr[i];  
 arr[i] = temp;  
 }  
 return arr;  
 }  
}



Q4. Write algorithm for Bubble sort.  
Ans. Bubble Sort Algorithm -

1. Start with the first element: Compare the first element with the next element.
2. Compare adjacent elements: If the current element is greater than the next element, swap them.
3. Repeat the process: Continue comparing and swapping adjacent elements until the end of the array is reached.
4. Repeat passes: Repeat the process until no more swaps are needed, indicating that the array is sorted.

Q5. Write pseudocode for Bubble sort.  
Ans.   
n = length of array

FOR i FROM 0 TO n-2

FOR j FROM 0 TO n-i-2

IF arr[j] > arr[j+1]

SWAP arr[j] WITH arr[j+1]

// Task006: Bubble sort  
  
package Sortings;  
  
public class Task006 {  
 public static void main(String[] args) {  
 int[] sortArr, arr = {4, 8, 1, 3, 2, 9, 7, 8, 4, 5, 6};  
 System.*out*.print("Unsorted: ");  
 for (int a: arr) System.*out*.print(a+" ");  
 System.*out*.print("\n Sorted: ");  
 sortArr = *bubbleSort*(arr);  
 for (int a: sortArr) System.*out*.print(a+" ");  
 }  
  
 private static int[] 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]){  
 int temp = arr[j+1];  
 arr[j+1] = arr[j];  
 arr[j] = temp;  
 }  
 }  
 }  
 return arr;  
 }  
}

