Lab3

# Problem 3

public void bubbleShort(int[] arr) {  
 for (int i = 0; i < arr.length; i++) {  
 boolean isSwap = false;  
 for (int j = 0; j < arr.length - 1; j++) {  
 if (arr[j] > arr[j + 1]) {  
 swap(j, j + 1);  
 isSwap = true;  
 }  
 }  
 if (!isSwap) {  
 break;  
 }  
 }  
}

I use a flag variable isSwap to check the input Array is sorted or not. With the sorted array isSwap never turn to be true then break the outer for loop.

The run time now is O(n) because: The outer for loop will run n time, the inner for loop run n – 1 time and the because the array is already sorted so isSwap never turn to true then the outer loop is broken. So the run time = n + n – 1 = 2n – 1 (O(n))