LU01.A03 - myBubbleSort

Teilauftrag 1: Statisch

In zwei FOR-Schleifen wird ein unsortiertes Array eine feste Anzahl mal durchlaufen. Die Anzahl der Schleifendurchlaeufe ist abhaengig von der Anzahl unsortierter Array-Elemente.

scripts_m307 > lu01_script4fun > JS lu01_l03_myBubbleSort_v1.js > bubbleSortV1

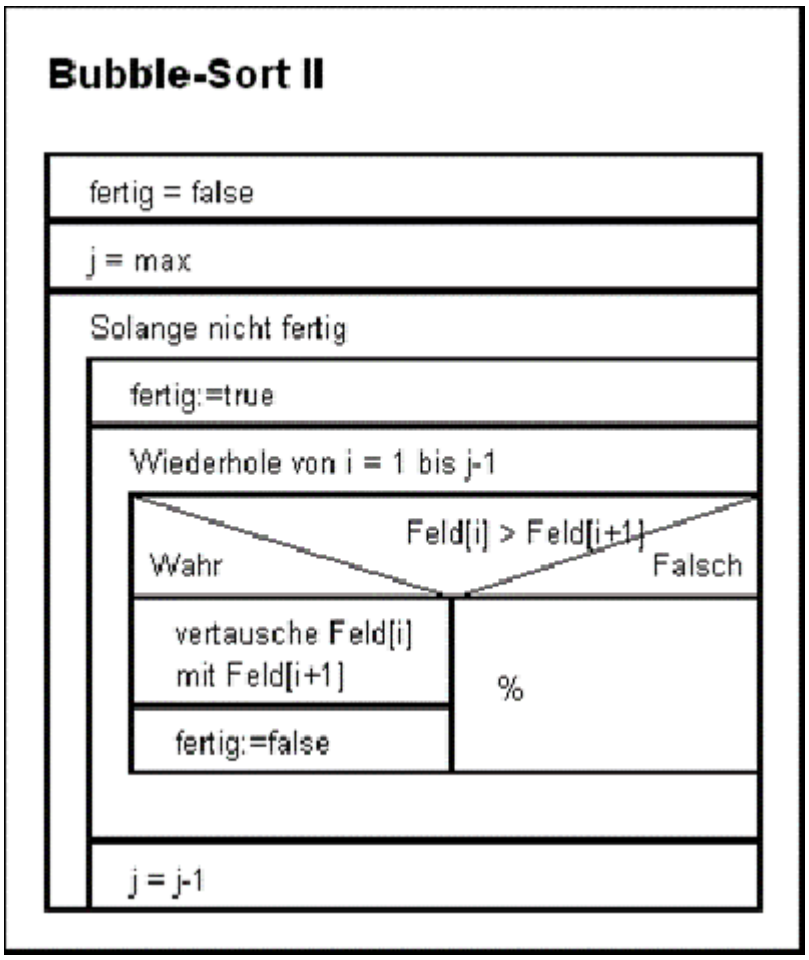
```
1   var unsortedArrayV1 = [3, 55, 2, 8, 33, 199, 120, 100, 999, 53, 44, 54, 67, 22, 0]; // unsorted array of numbers
2   console.clear();
3
4   console.log("array bubbleSortV1 - Vorher: ", unsortedArrayV1);
5   console.log("function bubbleSortV1 - Nachher: " + bubbleSortV1(unsortedArrayV1));
6
7
8   /* ********************************************************************** */
9   /* Author: volkan.demir@bzz.ch, 02.03.23                                  */
10  /* Call: bubbleSortV1 (array)                                             */
11  /* Desc: Returns the array in a ascending or descending order.            */
12  /*       The algorithm is not smart, since it uses 2 for-loops with fixe rage.*/
13  /* ********************************************************************** */
14  function bubbleSortV1(myUnsArray) {
15      let arrLen = myUnsArray.length;
16      let myLocArray=myUnsArray;
17      let swapCnt = 0; // count of the necessary swap due to the wrong order of the numbers
18      let loopCnt = 0; // count of the necessary swap due to the wrong order of the numbers
19
20      for (var i=0; i<=arrLen; i++) {
21          for (var j=0; j<arrLen; j++) {
22              loopCnt++;
23              if (myLocArray[j]>myLocArray[j+1]) { // ascending = <; descending = >
24                  swapCnt++; // count swap
25                //  console.log("swap1:"+swapCnt);
26                  var tmp=myLocArray[j]; // change of two values of variables
27                  myLocArray[j]=myLocArray[j+1];
28                  myLocArray[j+1]=tmp;
29              }
30          }
31      }
32      console.log("loopCnt: "+loopCnt);
33      console.log("swapCnt: "+swapCnt);
34      return myLocArray;
35  }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
    3,  55,   2,  8, 33, 199,
  120, 100, 999, 53, 44,  54,
   67,  22,   0
]
loopCnt: 240
swapCnt: 51
```

Teilauftrag 2: Flag

Variante 2 arbeitet intelligenter als die Variante 1. Mittels eines *Flag* (Ampel) wird bei jedem Durchlauf des Arrays ermittelt, ob die korrekte Sortierung vorliegt. Falls nicht wird ein weiterer Durchlauf gestartet.


Bubble-Sort II
fertig = false
j = max
Solange nicht fertig
fertig:=true
Wiederhole von i = 1 bis j-1
Feld[i] > Feld[i+1]
Wahr
Falsch
vertausche Feld[i] mit Feld[i+1]
fertig:=false
%
j = j-1

```
var unsortedArrayV2 = [3, 55, 2, 8, 33, 199, 120, 100, 999, 53, 44, 54, 67, 22, 0]; // unsorted array of numbers
console.log("function bubbleSortV2: " + bubbleSortV2(unsortedArrayV2));
/* ************************************************************************ */
/* Author: volkan.demir@bzz.ch, 02.03.23                                    */
/* Call: bubbleSortV1 (array)                                               */
/* Desc: Returns the array in a ascending or descending order.              */
/*       The algorithm is smart, it knows, when sorting is finished.        */
/* ************************************************************************ */
function bubbleSortV2(myUnsArray) {
    var arrLen = myUnsArray.length;
    var myLocArray=myUnsArray;
    var finished=false; //flag decides whether another loop or not
    var swapCnt = 0; // count of the necessary swap due to the wrong order of the numbers
    var loopCnt = 0;

    while (!finished) {
        loopCnt++;
        finished = true; // reset of the finished-flag
        for (var i=0; i<arrLen; i++) {
            if (myLocArray[i]>myLocArray[i+1]) { // ascending = <; descending = >
                swapCnt++; // count swap
                finished=false; // have to loop another time
               // console.log("swap2:"+swapCnt);

                var tmp=myLocArray[i]; // change of two values of variables
                myLocArray[i]=myLocArray[i+1];
                myLocArray[i+1]=tmp;
            }
            //console.log(myLocArray);
        }
    }
    myLocArray.push(loopCnt) // Adding the swap at the end of the array
    myLocArray.push(swapCnt) // Adding the swap at the end of the array
    return myLocArray;
}
```

```
.EMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

tion bubbleSortV1: 0,2,3,8,22,33,44,53,54,55,67,100,120,199,999,225,51
tion bubbleSortV2: 0,2,3,8,22,33,44,53,54,55,67,100,120,199,999,15,51
```