BUBBLE SORT

Bubble Sort is the simplest sorting algorithm that works by repeatedly swapping the adjacent elements if they are in wrong order.

**Example:**  
**First Pass:**  
( **5** **1** 4 2 8 ) –> ( **1** **5** 4 2 8 ), Here, algorithm compares the first two elements, and swaps since 5 > 1.  
( 1 **5** **4** 2 8 ) –>  ( 1 **4** **5** 2 8 ), Swap since 5 > 4  
( 1 4 **5** **2** 8 ) –>  ( 1 4 **2** **5** 8 ), Swap since 5 > 2  
( 1 4 2 **5** **8** ) –> ( 1 4 2 **5** **8** ), Now, since these elements are already in order (8 > 5), algorithm does not swap them.

**Second Pass:**  
( **1** **4** 2 5 8 ) –> ( **1** **4** 2 5 8 )  
( 1 **4** **2** 5 8 ) –> ( 1 **2** **4** 5 8 ), Swap since 4 > 2  
( 1 2 **4** **5** 8 ) –> ( 1 2 **4** **5** 8 )  
( 1 2 4 **5** **8** ) –>  ( 1 2 4 **5** **8** )  
Now, the array is already sorted, but our algorithm does not know if it is completed. The algorithm needs one **whole** pass without **any** swap to know it is sorted.

**Third Pass:**  
( **1** **2** 4 5 8 ) –> ( **1** **2** 4 5 8 )  
( 1 **2** **4** 5 8 ) –> ( 1 **2** **4** 5 8 )  
( 1 2 **4** **5** 8 ) –> ( 1 2 **4** **5** 8 )  
( 1 2 4 **5** **8** ) –> ( 1 2 4 **5** **8** )