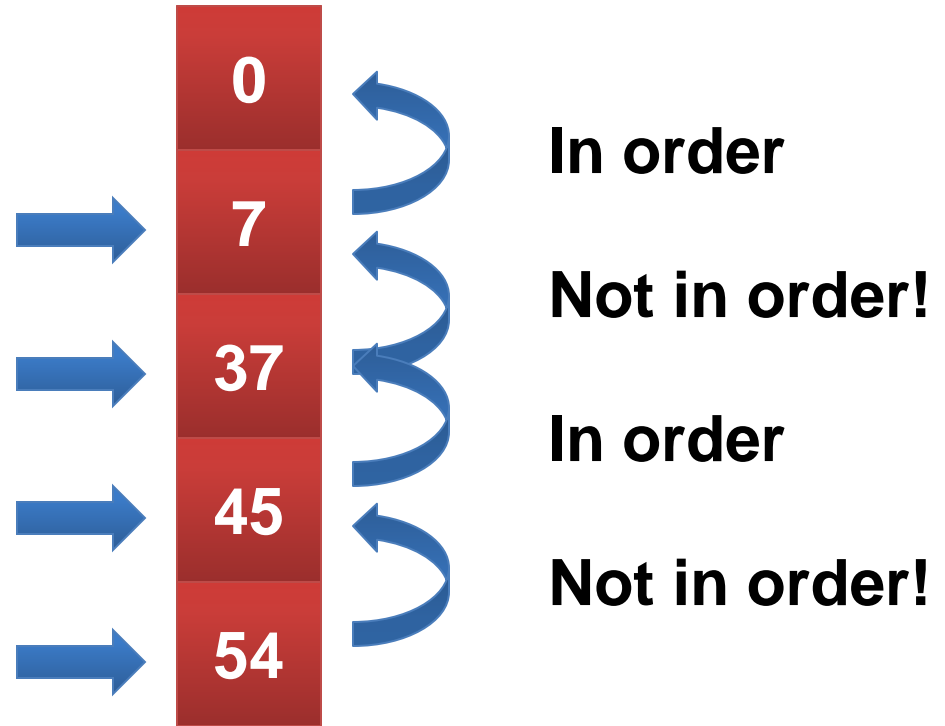Sorting

AP Computer Science

Insertion sort

Insertion sort

- Instead of "bubbling" down the largest number or "selecting" the minimum each pass, just find an out-of-order element and insert it in the correct index
- Repeat this process until each element is in its correct, sorted index

Insertion sort single pass

- Check if the current element is less than the previous one

- If so, shift over the elements until you "insert" it into the right spot

0
7
37
45
54

In order

Not in order!

In order

Not in order!

index **value**

4	37

Insertion sort code

```
for(int i = 1; i < arr.length; i++)
{
  int val = arr[i];
  int j = i;
  while(j > 0 && arr[j-1] > val)
  {
    arr[j] = arr[j - 1]; // shift greater values
    j--;                 // to the right
  }
  arr[j] = val; // insert the value into the
}             // computed position
```