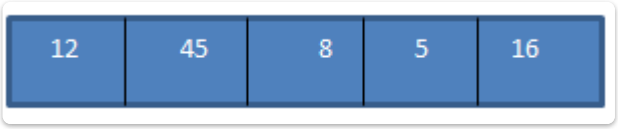
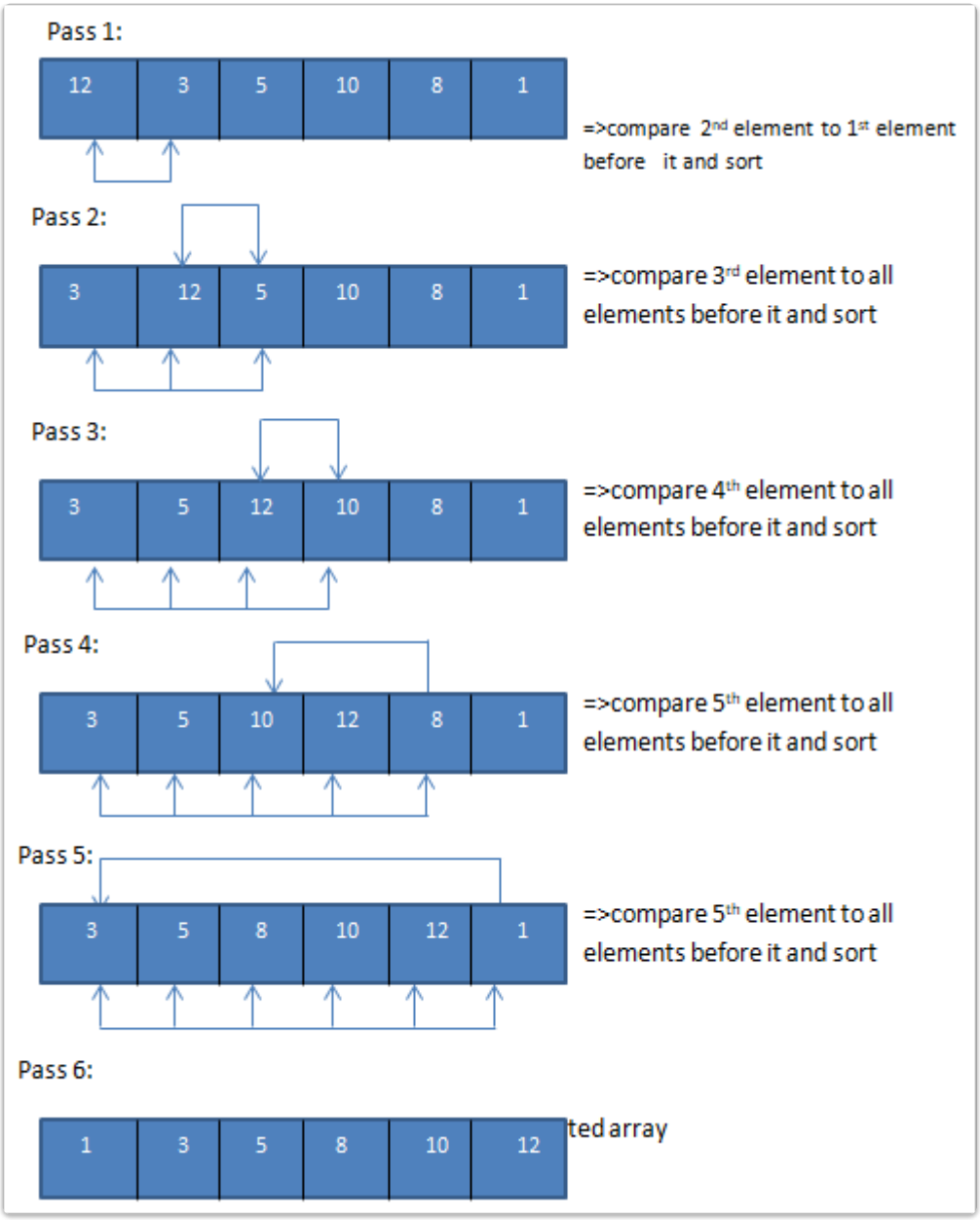
insertion sort

Builds up the final sorted list by transferring one element at a time.
Maintain a partially sorted array.
Keep elements in that partially sorted array sorted.
More efficient than selection sort.
complex then selection sort.

The array to be sorted is as follows:



Now for each pass, we compare the current element to all its previous elements. Thus in the first pass, we start with the second element.




```
for (i = 1; i < n; i++) {
     key = arr[i];
     j = i - 1;

     while (0 ⩽ j && key < arr[j]) {
         arr[j + 1] = arr[j];
                     j --;
     }
     arr[j + 1] = key;
 }
```

Time Complexity: O(N^2)
Auxiliary Space: O(1)
Already sorted array: O(N)