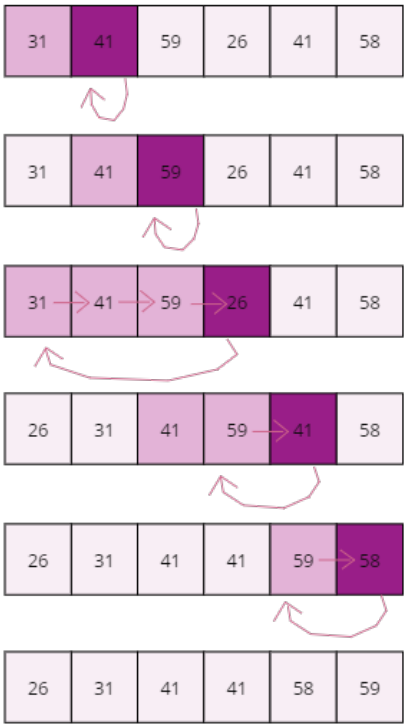
1 Using Figure 2.2 as a model? illustrate the operation of Insertion-Sort on the array A = (31,41,59,26,41,58).



2 Rewrite the Insertion-Sort procedure to sort into nonincreasing instead of non-decreasing order.

```
def sort(array):
    for i in range(1, len(array), 1):
```

```
        tempValue = array[i];
        j = i-1;
        while j >= 0 and array[j] <  tempValue:
            array[j+1] = array[j];
            j = j - 1;
        array[j+1] = tempValue;

array = [1,2,3,4,5,6];
sort(array)
print(array);


array = [6,5,4,3,2,1];
sort(array)
print(array);

array = [1];
sort(array)
print(array);
```

3 Consider the searching problem

Input: A sequence of n numbers = A = (a1,a2,..,an) and a value v.

Output: An index i such that v = A[i] or the special value NIL if v does not appear in A.

Write pseudocode for linear search? which scans through the sequence? looking for v/ Using a loop inveriant, prove that your algorithm is correct. Make sure that your loop invariant fullfills the three necessary properties.

```
def search(array, v):
    for i in range(0, len(array), 1):
       if array[i] == v:
           return i;
    return None;

print(search([1,2,3,4,5,6], 6));
print(search([1,2,3,4,5,6], 1));
print(search([1,2,3,4,5,6], 7));
```