Exercise: “A”

Insertion Sort

```python
def insertion_sort(nums):  1 usage
    n = len(nums)
    for i in range(1,n):
        key = nums[i]
        j = i - 1
        while j >= 0 and key < nums[j]:
            nums[j + 1] = nums[j]
            j -= 1
        nums[j + 1] = key
    return nums

l = [5,2,8,12,1,6,3]
print("Original List:",l)
print("Sorted(Insertion):",insertion_sort(l))
```

“Output”

```
"F:\project 2.0\.venv\Scripts\python.exe" D
Original List: [5, 2, 8, 12, 1, 6, 3]
Sorted(Insertion): [1, 2, 3, 5, 6, 8, 12]

Process finished with exit code 0
```

Shell Sort

```python
def shell_sort(nums):  1 usage
    n = len(nums)
    k = n // 2
    while k > 0:
        for i in range(k,n):
            temp = nums[i]
            j = i
            while j >= k and nums[j-k] > temp:
                nums[j] = nums[j - k]
                j -= k
            nums[j] = temp
        k = k//2
    return nums

lst = [5,2,8,12,1,6,3]
print("Original List:",lst)
print("Sorted(Shell):",shell_sort(lst))
```

“Output”

```
Original List: [5, 2, 8, 12, 1, 6, 3]
Sorted(Shell): [1, 2, 3, 5, 6, 8, 12]

Process finished with exit code 0
```