Step 1) By Hand: 30 minutes

My list of unsorted numbers was [35, 12, 7, 48, 22, 14, 3, 18, 49, 9, 28, 1, 43, 8, 16, 31, 20, 4, 50, 25]. It took me a minute to get the hang of the sorting method, but I got it in the end.

Step 2) Approach: 30 minutes

To solve this problem, we'll use a natural merge sort. A natural merge sort is a sorting method that finds already sorted sections ("runs") within an unsorted list and uses these to sort the entire list. The natural_merge_sort() function will start by scanning the unsorted list to identify any runs. For each run, the function will look for consecutive elements that are already in order, from left to right, until it reaches an element that's smaller than the previous one. Each run will be saved in a list of runs. Once all the runs have been identified, the function will repeatedly merge two runs at a time, always maintaining the order in each pair as it combines them. It'll continue this process of merging runs until only one run remains, which will be the fully sorted list. The function will then return this list

Step 3) Pseudocode and Structure Chart: 1 hour

```
FUNCTION natural_merge_sort(arr):

    sorted <- False

    WHILE !sorted

        runs <- []

        start <- 0

        WHILE start < len(arr)

            end <- start + 1

            WHILE end < len(arr) AND arr[end] >= arr[end - 1]

                end <- end + 1

            runs.append(arr[start:end])

            start <- end

    IF len(runs) == 1

        RETURN runs[0]

    ELSE
```

```
        merged_runs <- []

        FOR i IN range(0, len(runs), 2)

            IF i + 1 < len(runs)

                merged_runs.append(merge(runs[i], runs[i + 1]))

            ELSE

                merged_runs.append(runs[i])

        arr <- [item FOR run IN merged_runs FOR item IN run]
FUNCTION merge(list1, list2)

    merged <- []

    i, j <- 0, 0

    WHILE i < len(list1) AND j < len(list2)

        IF list1[i] <= list2[j]:

            merged.append(list1[i])

            i = i + 1

        ELSE:

            merged.append(list2[j])

            j = j + 1

    merged.extend(list1[i:])

    merged.extend(list2[j:])

    RETURN merged
```

Step 4) Copilot:

Step 5) Compare and Contrast:

Step 6) Update: