9. Sorting Algorithms :: Merge Sort Pseudocode

We will first discuss the primary recursive merge sort procedure and then we will discuss how to implement the merge procedure. Note: this implementation sorts the list into ascending order. With a few minor changes, it is simple to make it sort into descending order.

```
Method recursiveMergeSort(InOut: List<T> list)
  -- The base case is reached when the size of list is 1. The list is trivially
  -- sorted so we have nothing to do.
  If list.size = 1 Then Return

  -- Otherwise, split the list into two halves: a left half and a right half.
  -- Recursively merge sort each half.
  list_L ← list[0..list.size / 2 - 1]
  list_R ← list[list.size / 2..list.size - 1]
  recursiveMergeSort(list_L)
  recursiveMergeSort(list_R)

  -- On return from the two method calls above, both list_L and list_R will be sorted.
  -- Merge them to form a sorted list.
  merge(list_L, list_R, list)
End Method recursiveMergeSort
```

9. Sorting Algorithms :: Merge Sort Pseudocode (continued)

```
Method merge(In: List<T> list_L; In: List<T> list_R; Out: List<T> list)
  leftIndex ← 0; rightIndex ← 0; listIndex ← 0
  While leftIndex < list_L.size and rightIndex < list_R.size Do
    If list_L[leftIndex] ≤ list_R[rightIndex] Then
      list[listIndex] ← list_L[leftIndex]
      leftIndex ← leftIndex + 1
    Else
      list[listIndex] ← list_R[rightIndex]
      rightIndex ← rightIndex + 1
    End If
    listIndex ← listIndex + 1
  End While
  If leftIndex < list_L.size Then
    copyRest(list_L, leftIndex, list, listIndex)
  Else
    copyRest(list_R, rightIndex, list, listIndex)
  End If
End Method merge
```

9. Sorting Algorithms :: Merge Sort Pseudocode (continued)

```
-- Copies elements from srcList[srcIndex..srcList.size - 1] to dstList starting at
-- index dstIndex.
Method copyRest(In: List<T> srcList; In: srcIndex; InOut: List<T> dstList; In: dstIndex)
  While srcIndex < srcList.size Do
    dstList[dstIndex] ← srcList[srcIndex]
    srcIndex ← srcIndex + 1
    dstIndex ← dstIndex + 1
  End While
End Method copyRest
```