MERGE SORTED

Merge Sorted ( ):

Description: Here **A** is a sorted array with **M** elements and **B** is a sorted array with N elements. **C** is an empty array with **P** locations where **P >= M + N**.

```
1.   Set I = J = K = 1                    [Initialize counters]
2.   Repeat While (I <= M) and (J <= N)
3.        If (A[I] < B[J]) Then
4.             Set C[K] = A[I]           [Assign elements of array A to array C]
5.             Set I = I + 1
6.        Else
7.             Set C[K] = B[J]           [Assign elements of array B to array C]
8.             Set J = J + 1
          [End of If]
9.        Set K = K + 1
     [End of While Loop]
10.  If (I > M) Then                      [Array A is empty]
11.       Repeat While (J <= N)
12.            Set C[K] = B[J]           [Assign the remaining elements of array B to array C]
13.            Set J = J+1 and K = K+1
          [End of While Loop]
     [End of If]
14.  If (J > N) Then                      [Array B is empty]
15.       Repeat While (I <= M)
16.            Set C[K] = A[I]           [Assign the remaining elements of array A to array C]
17.            Set I = I+1 and K = K+1
          [End of While Loop]
     [End of If]
18.  Exit
```

Explanation: The above algorithm merges the elements of sorted array A and sorted array B into a sorted array C. First of all, we must keep track of the locations of the smallest element of A and the smallest element of B which have not yet been placed in C. I and J denote these locations respectively, and K denotes the location in C to be filled. Therefore, initially, we set I = J = K = 1.

In step 3, we compare A [I] and B [J] and assign the smallest element to C [K]. Then we either increment I by setting I = I + 1 or increment J by setting J = J + 1, according to whether the new element in C has come from A or B. And also we increment K by setting K = K + 1. If I > M, then it means array A has become empty and the remaining elements of B are assigned to C, or if J > N, then it means array B has become empty and the remaining elements of A are assigned to C.