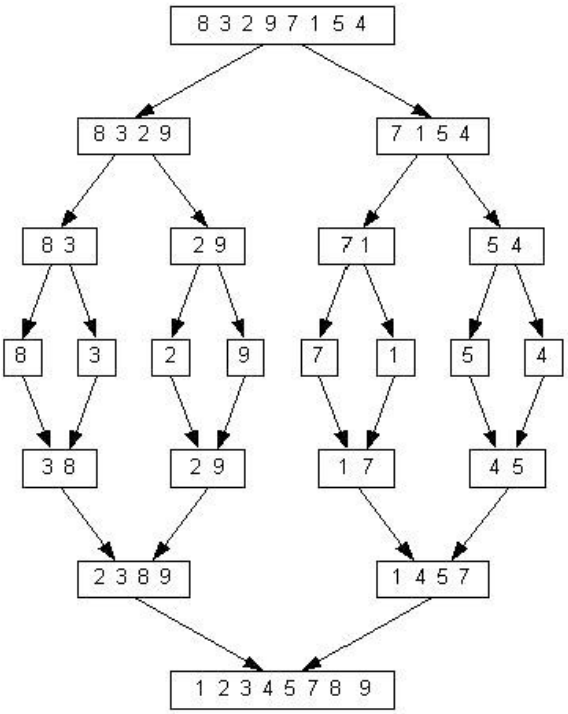
CST 370
Homework (Sorting)

1. (**20 points**) Sort the array of numbers 4, -3, 8, 1, 10 in ascending order using the **selection sort algorithm**. Show the state of the array after each iteration of the algorithm.
2. (**20 points**) Sort the array of numbers 4, -3, 8, 1, 10 in ascending order using the **bubble sort algorithm**. Show the state of the array after each iteration of the algorithm.
3. (**25 points**) Sort the array of numbers 10, 7, 3, 8, 1, 9, 0 in ascending order using the **insertion sort algorithm**. Show the state of the array after each iteration of the algorithm.
4. (**25 points**) Sort the array of numbers: 13, 22, 57, 99, 39, 64, 57, 48, 70 in ascending order using the **merge sort algorithm**. Show the state of various arrays after each iteration of the algorithm using the diagram similar to the one used in the supplemental materials, as shown below.



5. **(10 points**) Suppose you are given a list of N integers. All but one of the integers are sorted in numerical order. Identify a sorting algorithm from class which will sort this special case in $O(N)$ time and explain why this sorting algorithm achieves $O(N)$ runtime in this case.