ICS4U - Simple Sort Algorithm

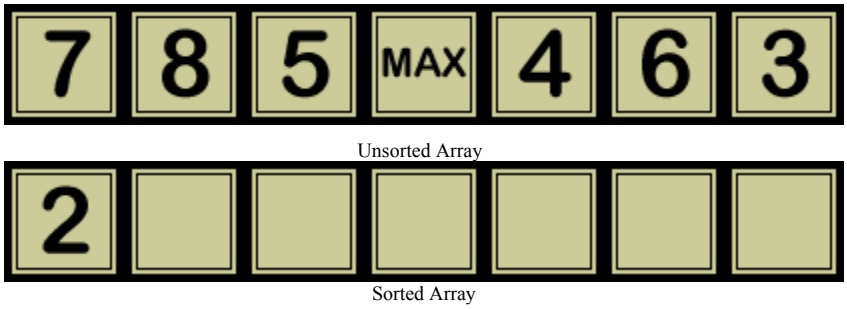
Sorting Steps:

1. Get a list of unsorted numbers
2. Repeat steps 3 through 6 until the unsorted list is empty
3. Compare the unsorted numbers
4. Select the smallest unsorted number
5. Move this number to the sorted list
6. Store a maximum value in the place of the smallest number
7. Stop

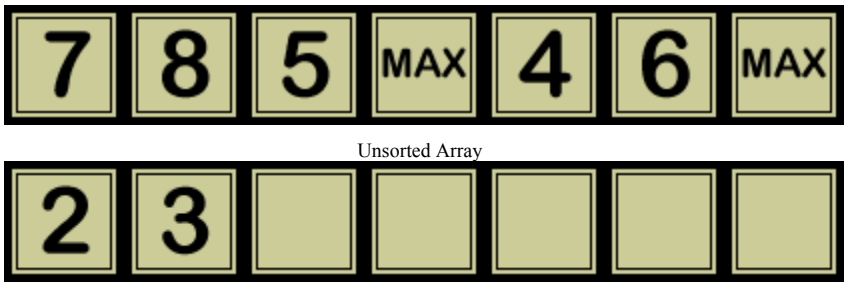
First, we give the computer a list of unsorted numbers. These numbers are stored in a group of contiguous memory cells called an array. Each memory cell of the array holds a single number.

As the computer sorts these numbers, it will repeatedly compare them to find the smallest number. This is similar to the comparisons we made when sorting our hand of cards. Each time we compared two cards and kept the smaller of the two. Then we compared this card to the remaining cards until we found a smaller one or checked all the cards.

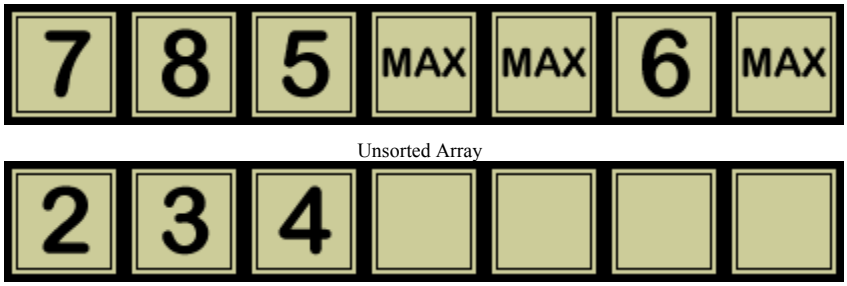
Once the smallest number is found, the computer will copy this number to a new array of memory cells and replace the old number with a special number called MAX. MAX is the largest number a single memory cell can hold.



Now the computer begins searching for the smallest number again. Six more comparisons are required to determine that 3 is smallest: (7 < 8), (7 > 5), (5 < MAX), (5 > 4), (4 < 6), and finally (4 > 3). Now we can see the importance of replacing 2 with MAX in our previous step. If we had not made this change, then 2 would have been selected as the smallest number again. After copying 3 to the sorted array, the computer also replaces the original with MAX.



With six more comparisons, the computer selects 4 as the smallest number, copies it to the sorted array, and replaces the original with MAX.



The numbers 5, 6, 7, and 8 are also selected in turn by six comparisons, a copy, and a replacement of the original. Once all the memory cells in the unsorted array have been considered, the sorted array contains our original numbers in sorted order.