

Algorithm Design
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John Wiley & Sons
Solution of Exercise C-4.9

For the red and blue elements, we can order them by doing the following. Start with a marker at the beginning of the array and one at the end of the array. While the first marker is at a blue element, continue incrementing its index. Likewise, when the second marker is at a red element, continue decrementing its index. When the first marker has reached a red element and the second a blue element, swap the elements. Continue moving the markers and swapping until they meet. At this point, the sequence is ordered. With three colors in the sequence, we can order it by doing the above algorithm twice. In the first run, we will move one color to the front, swapping back elements of the other two colors. Then we can start at the end of the first run and swap the elements of the other two colors in exactly the same way as before. Only this time the first marker will begin where it stopped at the end of the first run.