Let $X[1 \ldots m]$ and $Y[1 \ldots n]$ be two arrays, containing $m$ and $n$ numbers, respectively, with both arrays being already in sorted order. Give an $O(\lg(\min(m,n)))$-time algorithm to find the median of all $m + n$ elements in arrays $X$ and $Y$. [Note: Exercise 9.3-8 asks about the special case where $m = n$.]

Variant of Exercise 9.3-8 on Page 223 Let $X[1 \ldots m]$ and $Y[1 \ldots n]$ be two arrays, containing $m$ and $n$ numbers, respectively, with both arrays being already in sorted order. Give an $O(\lg(\min(m,n)))$-time algorithm to find the median of all $m + n$ elements in arrays $X$ and $Y$. [Note: Exercise 9.3-8 asks about the special case where $m = n$.]

Pages 224–225 Problem 9-1, 9-2(a,b,c). (For both problems, you can assume the existence of a worst-case $O(n)$ selection algorithm without knowing how it is implemented.)