Instructions:

- All are eligible to attempt this.
- Do the one question corresponding to when you took Exam I
- This carries 10 points in addition to your score on Exam I
- Good Luck.

1. For those who took Exam I on September 26: Due Date: October 10: Suppose we are given a "bitonic" array $A[1, 2, ..., n]$ of numbers. By "bitonic" we mean that the array is strictly increasing up to some index $p$ (unknown to us) and then strictly decreases: i.e. $A[1] < A[2] < ... < A[p]$ and $A[p] > A[p+1] > ... > A[n]$ - please note that the possibilities that $p = 1$ or $p = n$ are NOT excluded. We are allowed to use only comparisons. We want to find the index $p$. Devise an efficient divide-and-conquer algorithm to solve this problem, set up the corresponding recurrence relation and solve it.