CPSC 320: Intermediate Algorithm Design and Analysis
Assignment #7, due Thursday, March 29th, 2012 at 11:00

[15] 1. Consider the problem of taking a **sorted** array A containing distinct integers, and determining whether or not there is a position i such that $A[i] = i$.

[6] a. Describe a divide-and-conquer algorithm to solve this problem. Your algorithm should return such a position if it exists, or `false` otherwise. If $A[i] = i$ for several different integers i, then you may return any one of them.

[6] b. Prove the correctness of your algorithm. That is, show that it will always return a value of i for which $A[i] = i$, unless no such value exists in which case it will return `false`.

[3] c. Analyze the running time of your algorithm as a function of the number of elements of A.