
Algorithm 1 Medium-Search

Input: x : a sorted array of size n ; y : a sorted array of size n ;

n : the number of input arrays;

Output: *medium*: the medium of two arrays;

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1: if  $n = 1$  then
2:   return  $\frac{x[0]+y[0]}{2}$ ;
3: end if
4:  $a = \text{getMid}(x)$ ;
5:  $b = \text{getMid}(y)$ ;
6: if  $a = b$  then
7:   return  $a$ ;
8: else if  $a < b$  then
9:    $x_1 =$  the sub-array of  $x$  with index from  $\lceil \frac{n-2}{2} \rceil$  to  $n-1$ ;
10:   $y_1 =$  the sub-array of  $y$  with index from  $0$  to  $\lfloor \frac{n-1}{2} \rfloor$ ;
11:  return Medium-Search( $x_1, y_1, \lceil \frac{n+1}{2} \rceil$ );
12: else
13:   $x_2 =$  the sub-array of  $x$  with index from  $0$  to  $\lfloor \frac{n-1}{2} \rfloor$ ;
14:   $y_2 =$  the sub-array of  $y$  with index from  $\lceil \frac{n-2}{2} \rceil$  to  $n-1$ ;
15:  return Medium-Search( $x_2, y_2, \lceil \frac{n+1}{2} \rceil$ );
16: end if
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