

Merge 2 sorted array

$A = [1, 2, 3, 0, 0, 0]$ ,  $m = 3$

$B = [2, 5, 6]$ ,  $n = 3$

↓

$A = [1, 2, 2, 3, 5, 6]$

$O(1)$  SC &  $O(n+m)$  TC



compare  $i$  &  $j$  and whichever is bigger put at  $ida$  &  $ida--$  and either  $i--$  or  $j--$

Pseudo code

$ida = m+n-1$ ,  $i = m-1$ ,  $j = n-1$

while ( $i \geq 0$  &  $j \geq 0$ ) {

if ( $A[i] \geq B[j]$ )

$A[ida] = A[i] \Rightarrow ida--, i--$

else

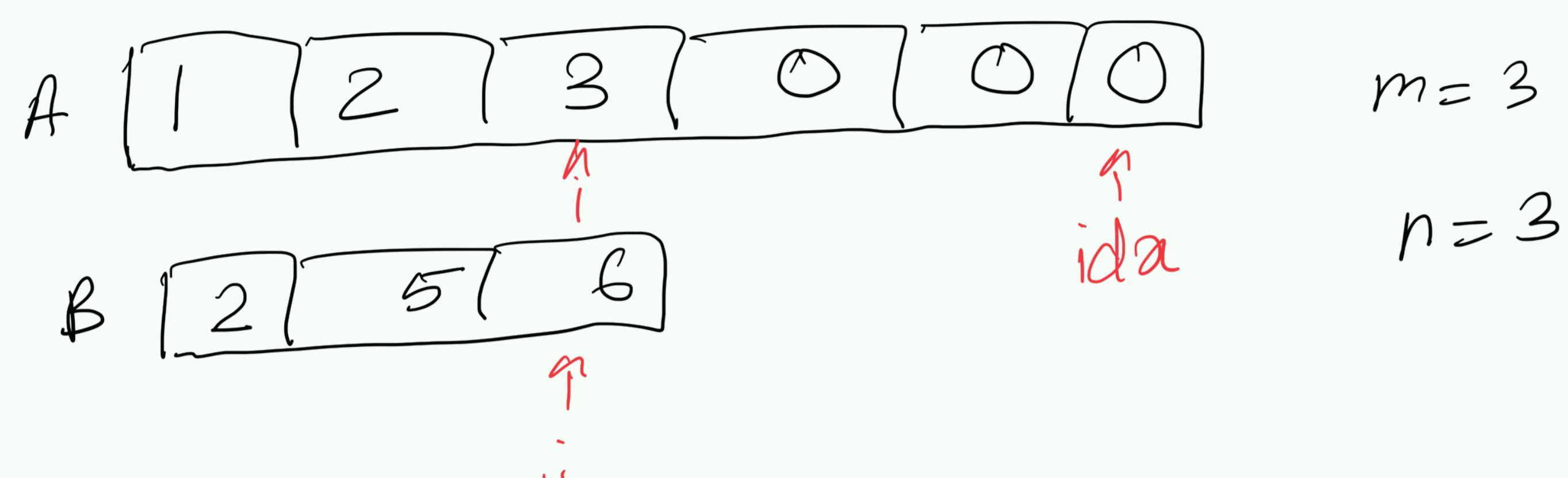
$A[ida] = B[j] \Rightarrow ida--, j--$

while ( $j \geq 0$ ) {

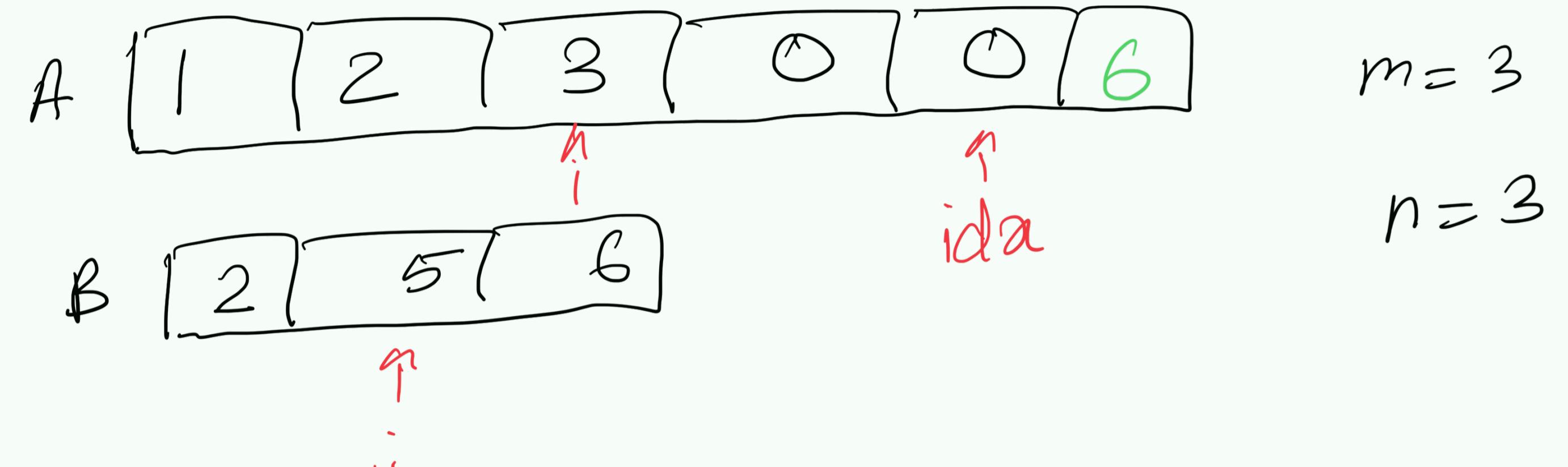
$A[ida-j] = B[j-1];$

}

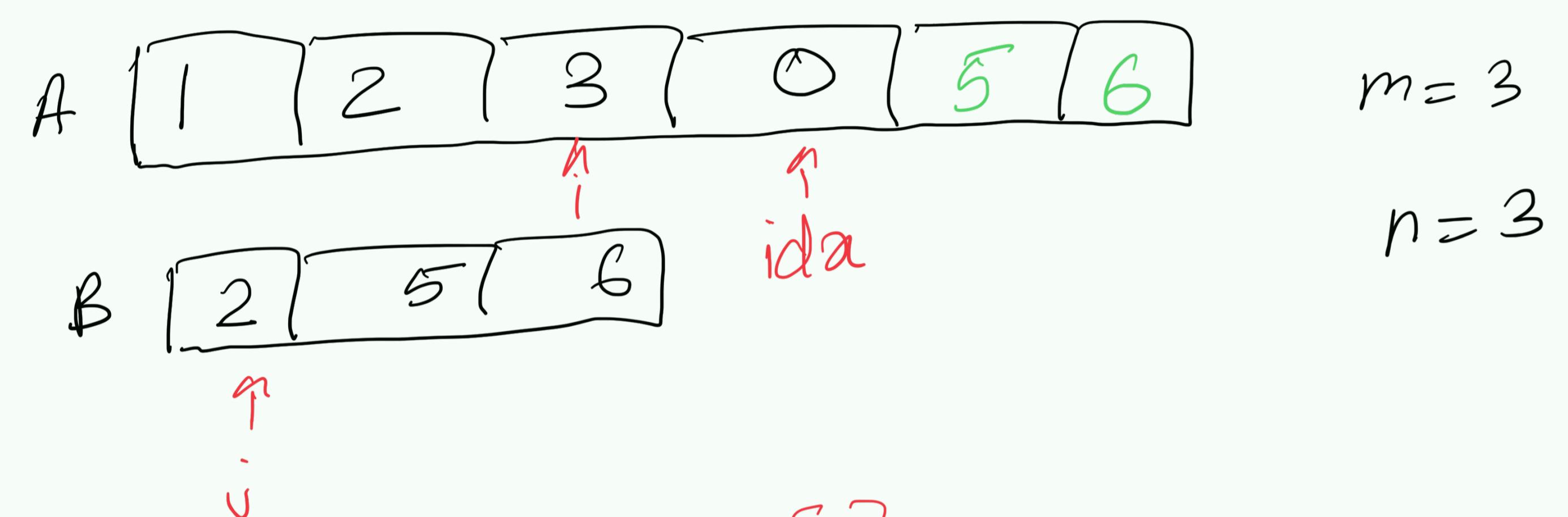
Dry run



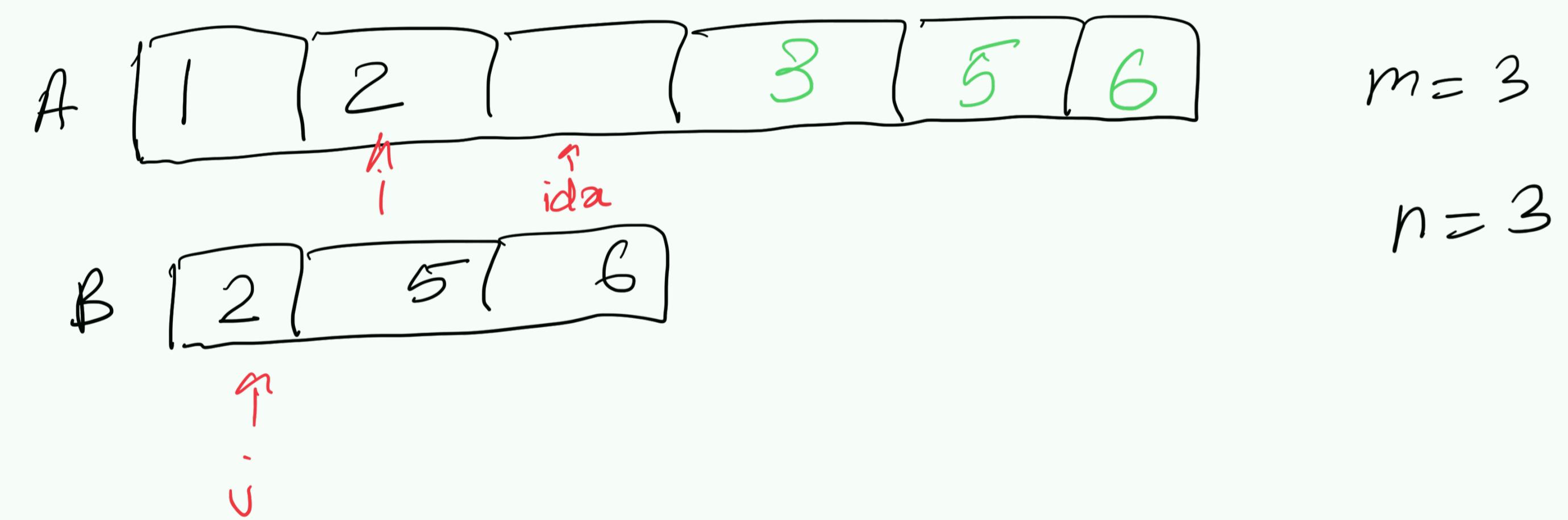
since  $B[j] > A[i]$  &  $ida--$   
 $A[ida] = B[j]$  &  $j--$



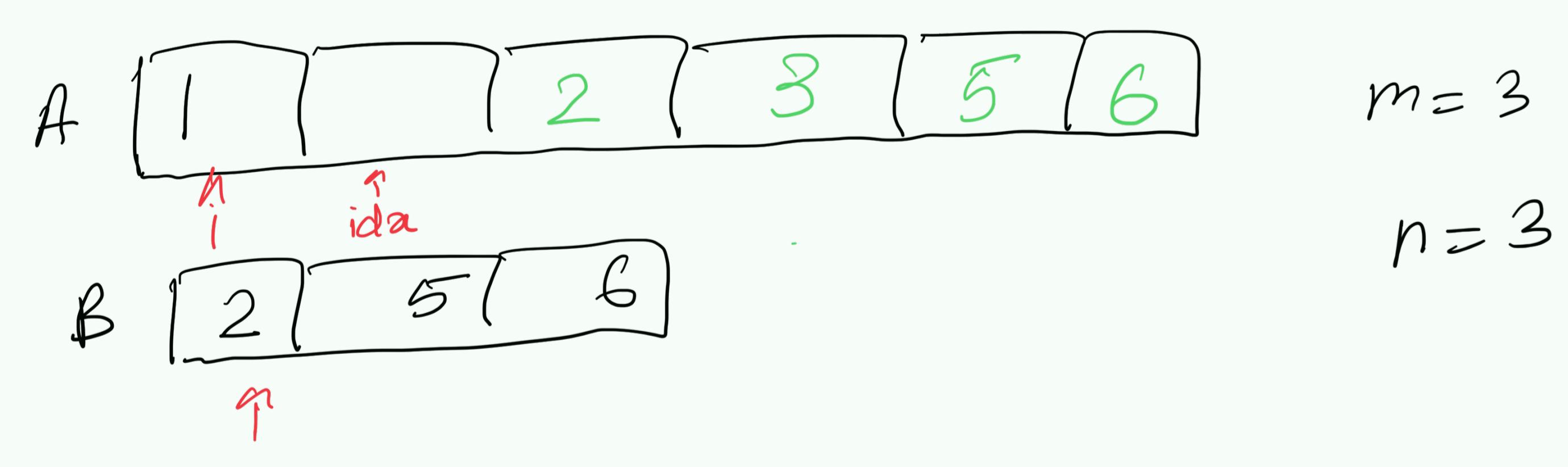
since  $B[j] > A[i]$  &  $ida--$   
 $A[ida] = B[j]$  &  $j--$



$A[i] > B[j]$  &  $ida--$   
 $A[ida] = A[i]$  &  $i--$



$A[i] \geq B[j]$  &  $ida--$   
 $A[ida] = A[i]$  &  $i--$



$B[j] > A[i]$  &  $ida--$   
 $A[ida] = B[j]$  &  $j--$

