

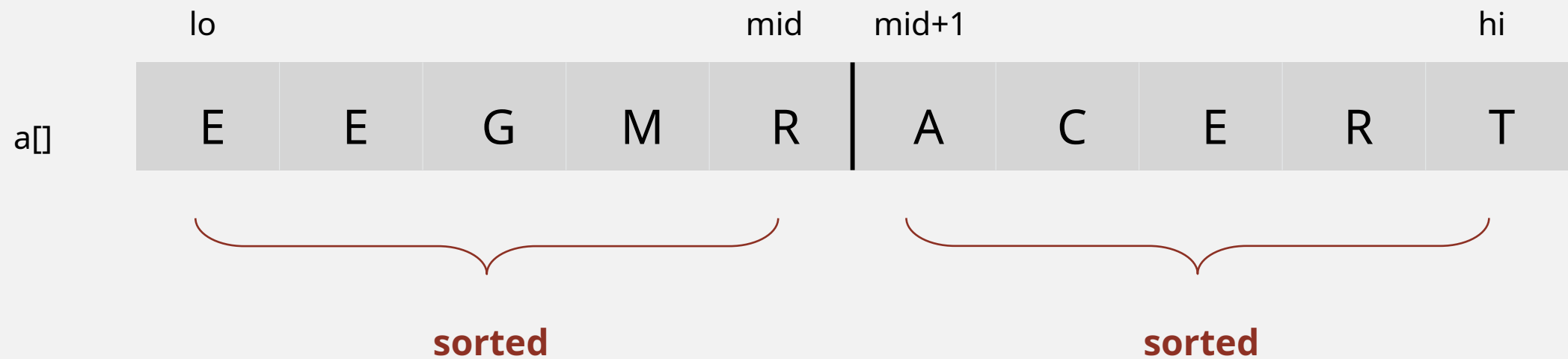


<http://algs4.cs.princeton.edu>

2.2 Merging Demo

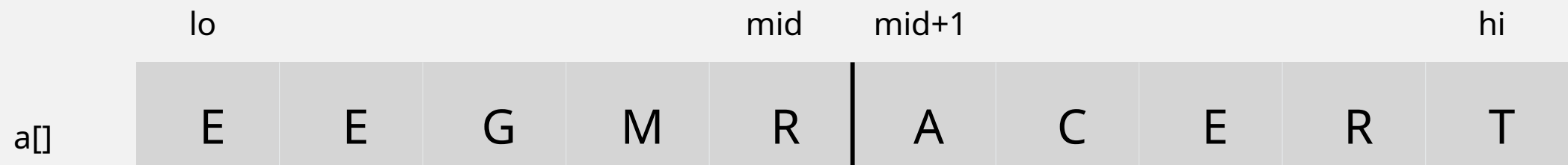
Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

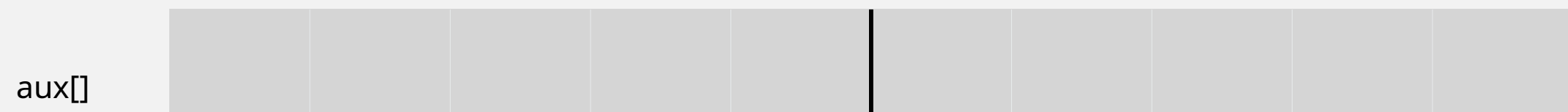


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.



copy to auxiliary array



Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

$a[]$

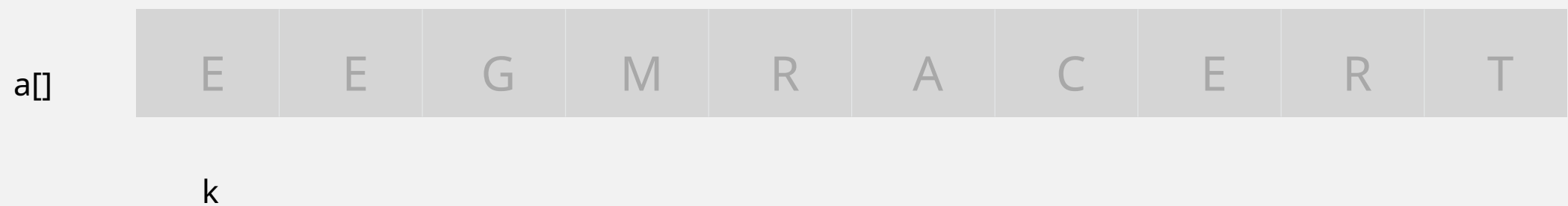
E	E	G	M	R	A	C	E	R	T
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$\text{aux}[]$

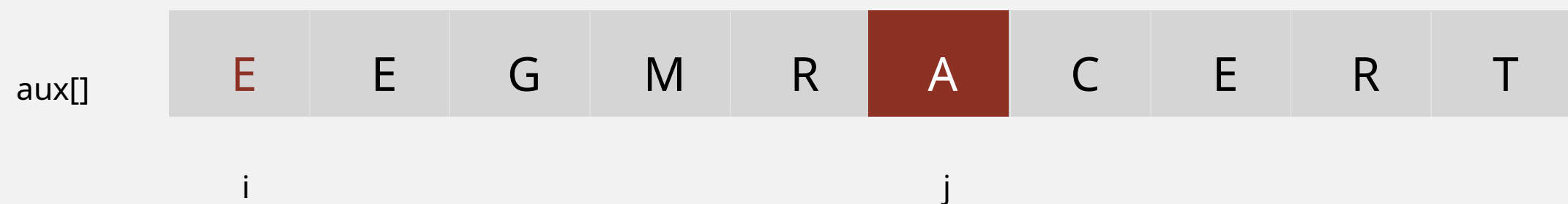
E	E	G	M	R		A	C	E	R	T
---	---	---	---	---	--	---	---	---	---	---

Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

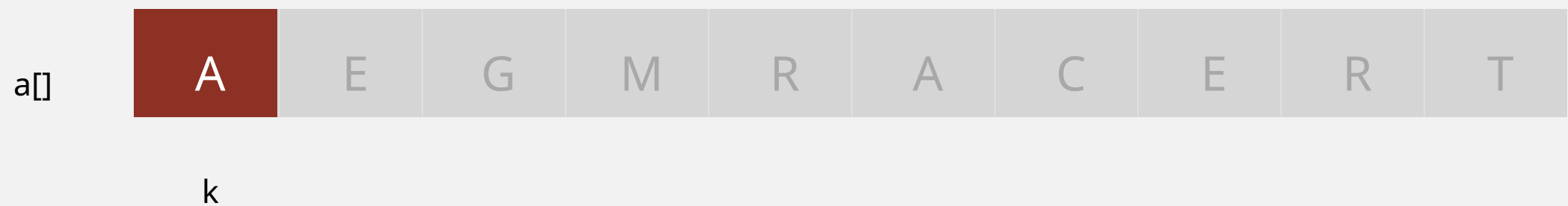


compare minimum in each subarray

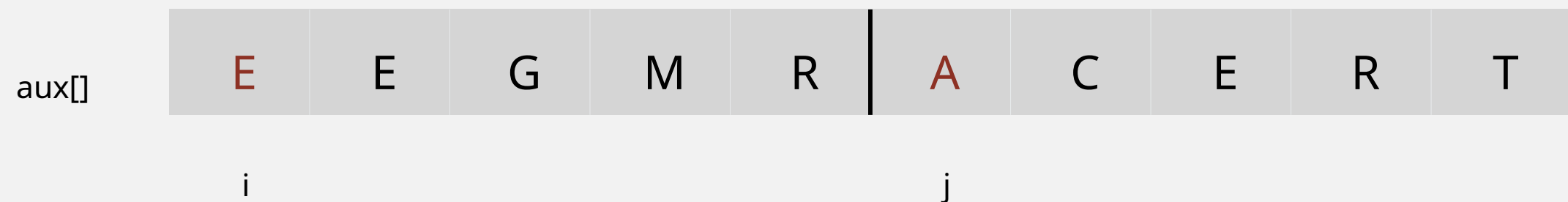


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

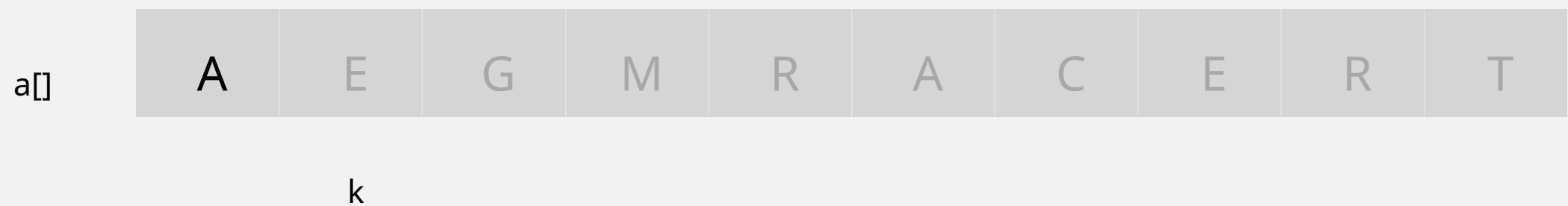


compare minimum in each subarray

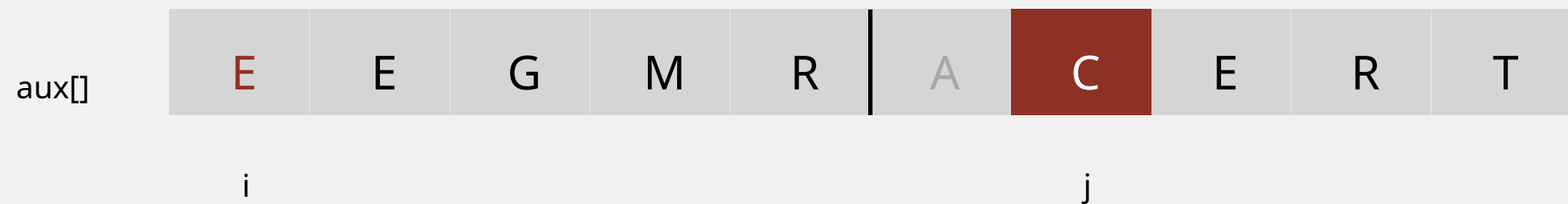


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

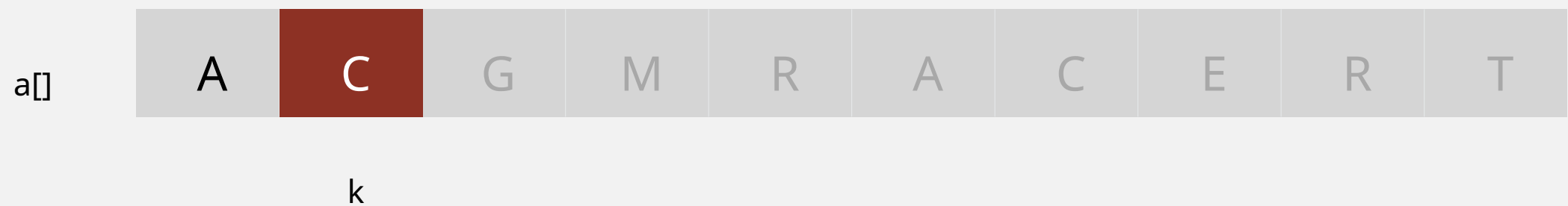


compare minimum in each subarray

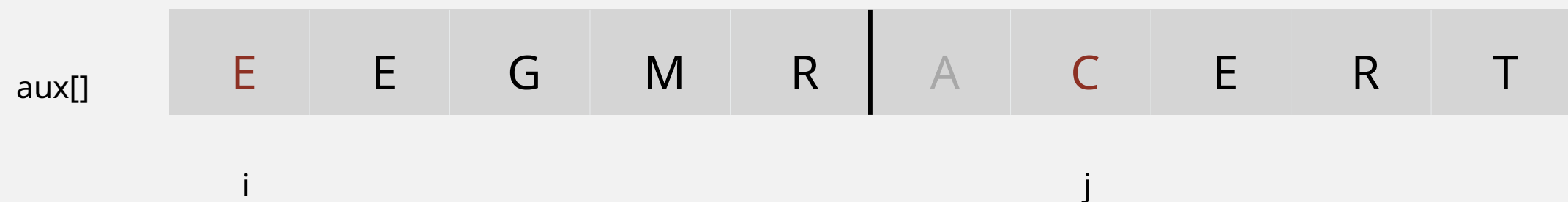


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

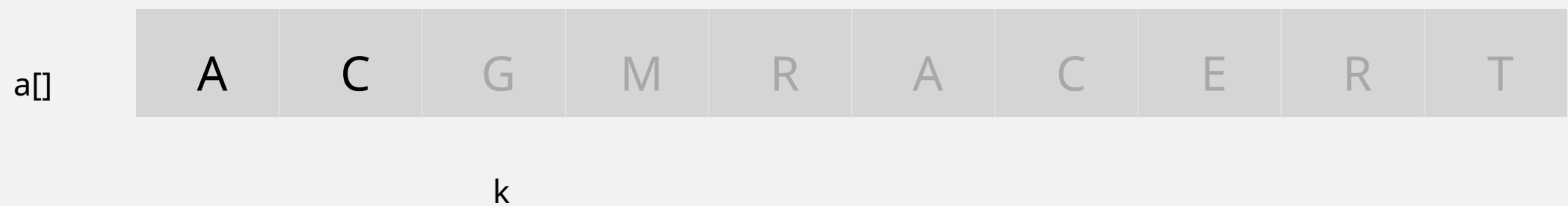


compare minimum in each subarray

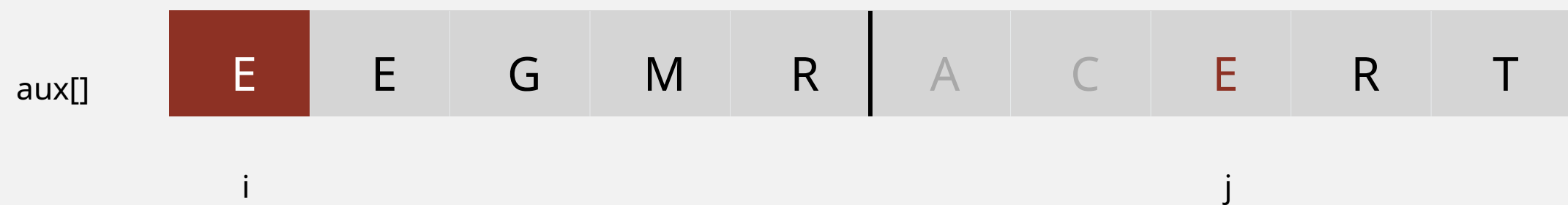


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

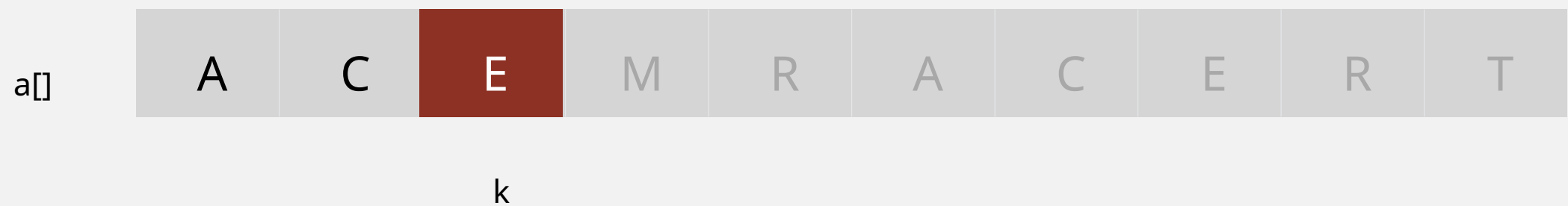


compare minimum in each subarray

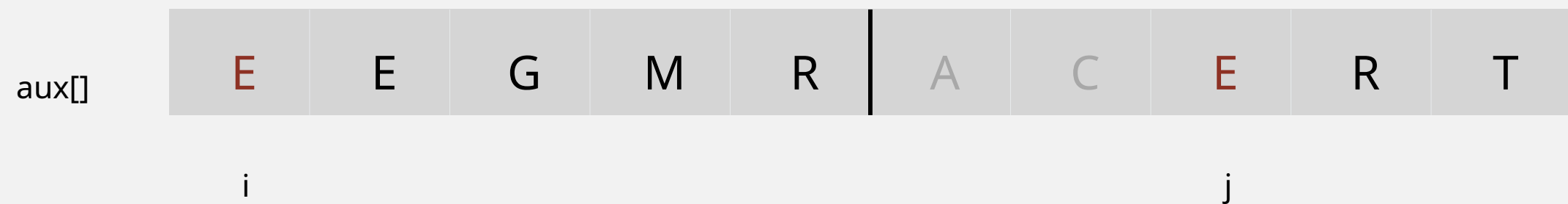


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

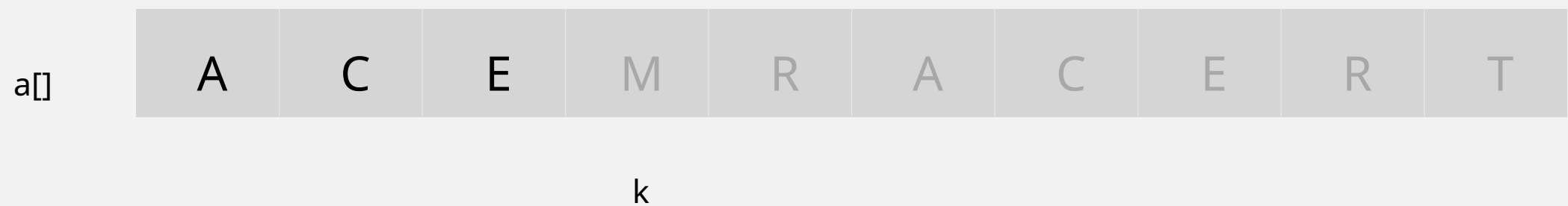


compare minimum in each subarray



Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

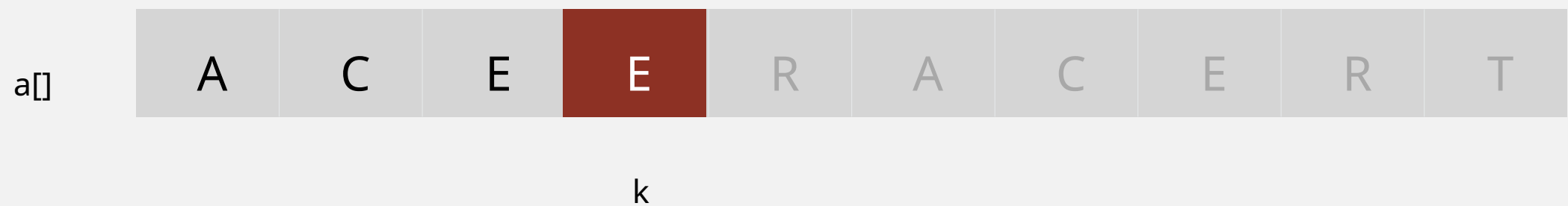


compare minimum in each subarray

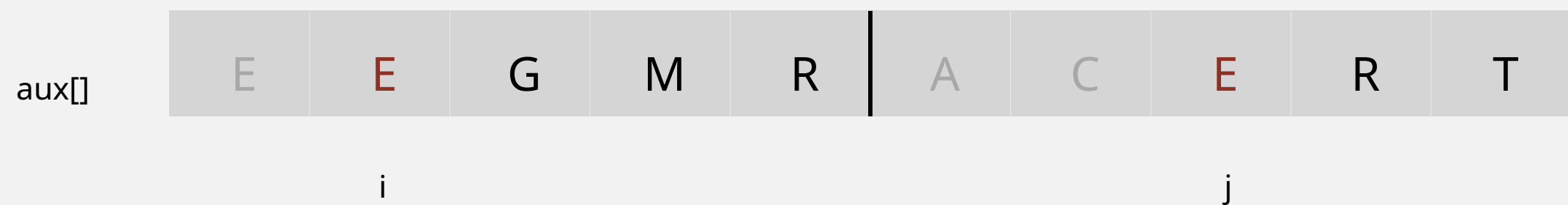


Merging demo

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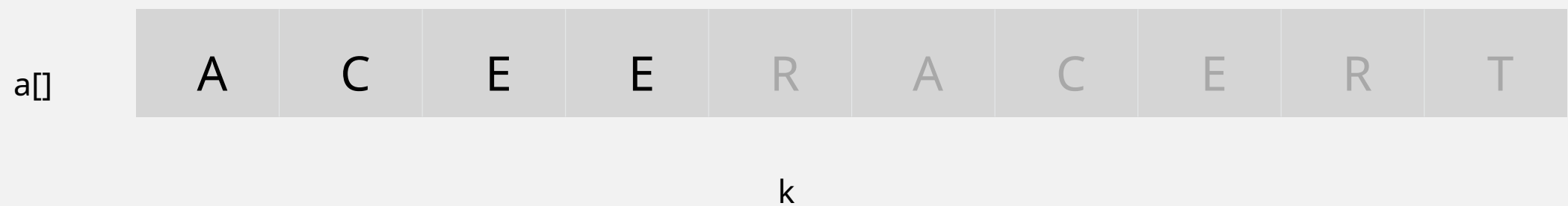


compare minimum in each subarray

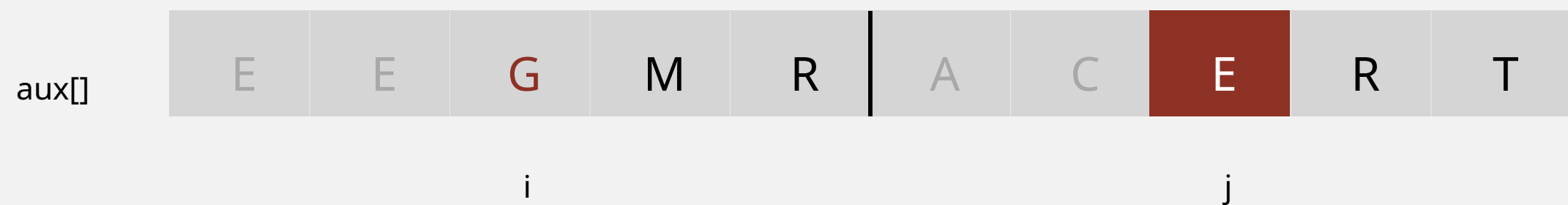


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.

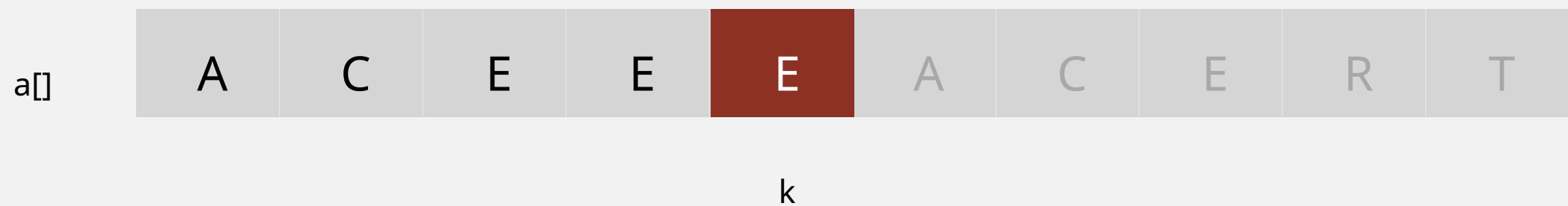


compare minimum in each subarray

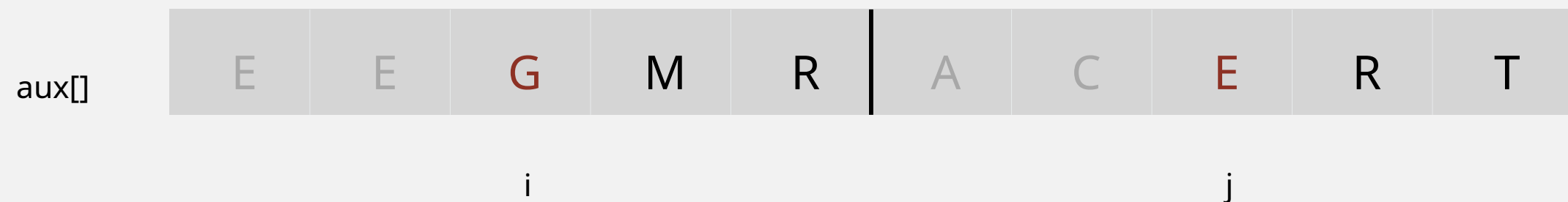


Merging demo

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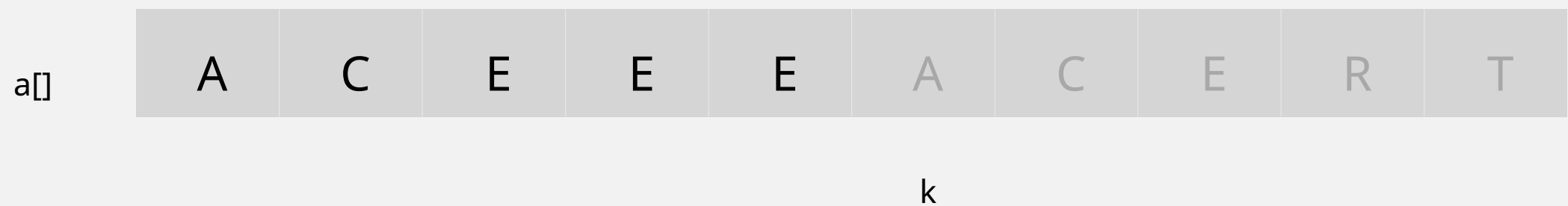


compare minimum in each subarray

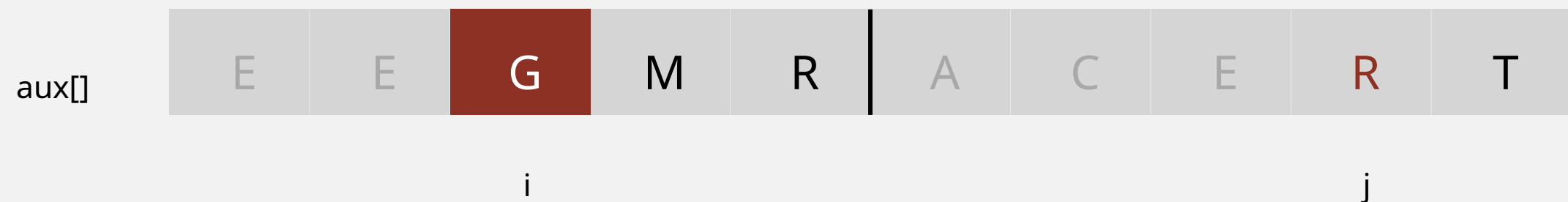


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.

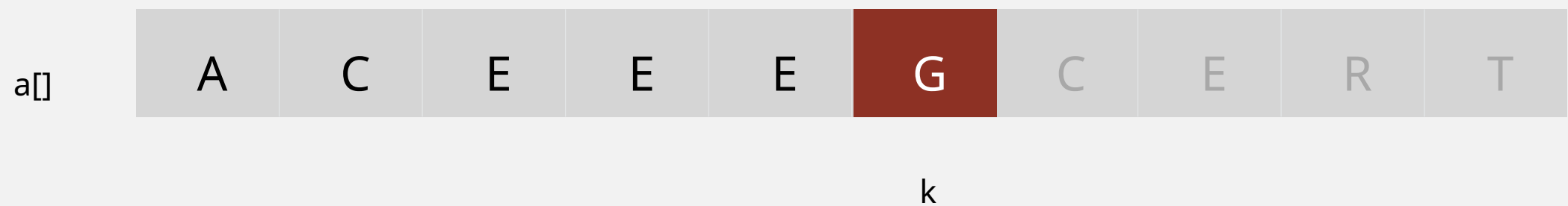


compare minimum in each subarray

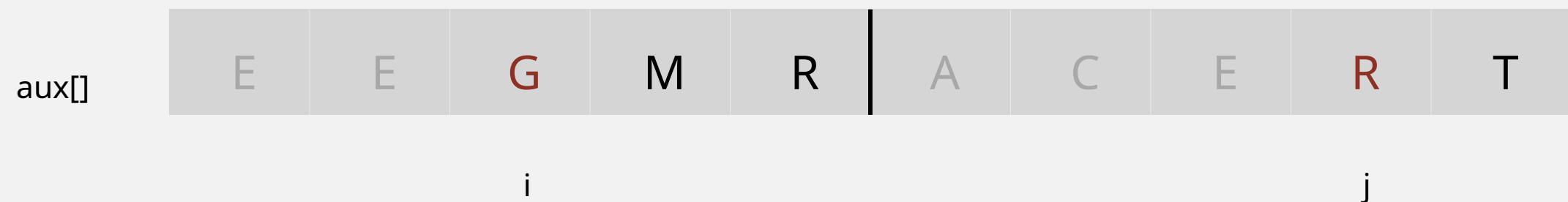


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.

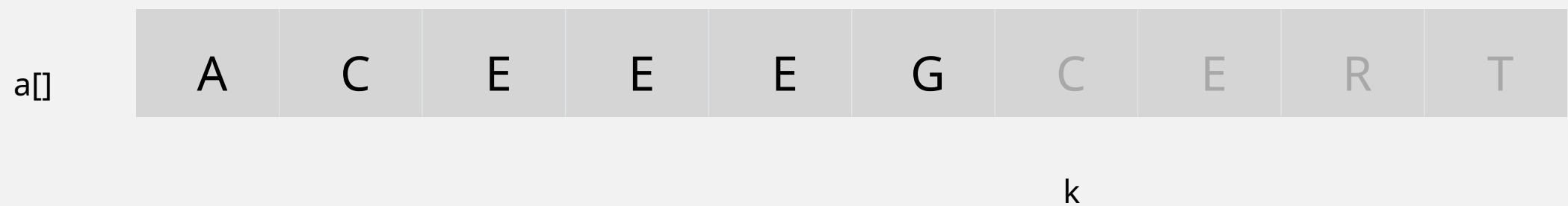


compare minimum in each subarray

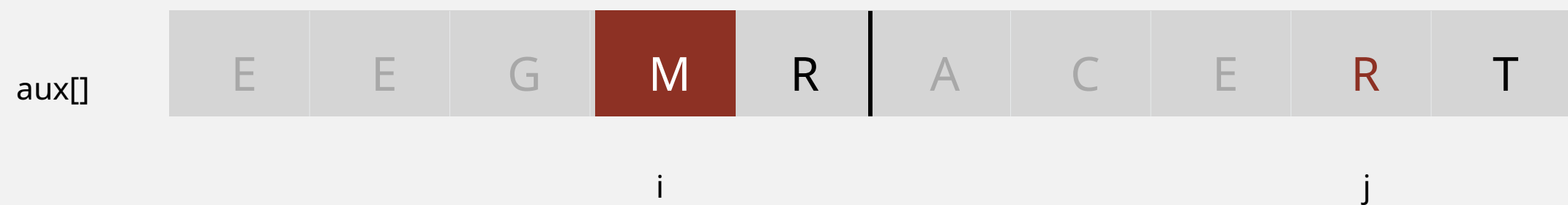


Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

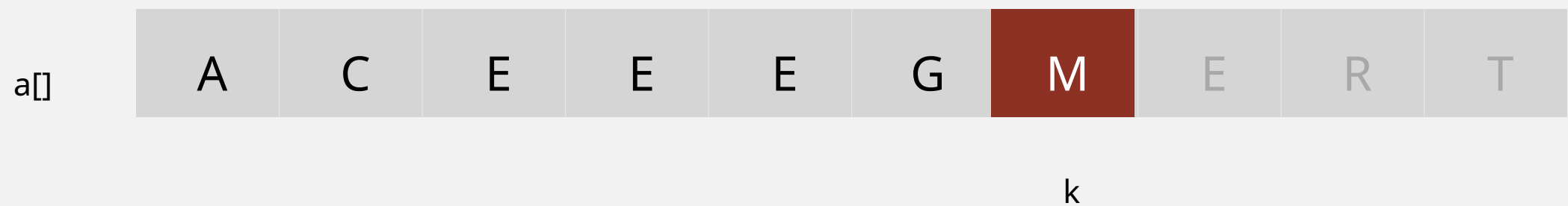


compare minimum in each subarray

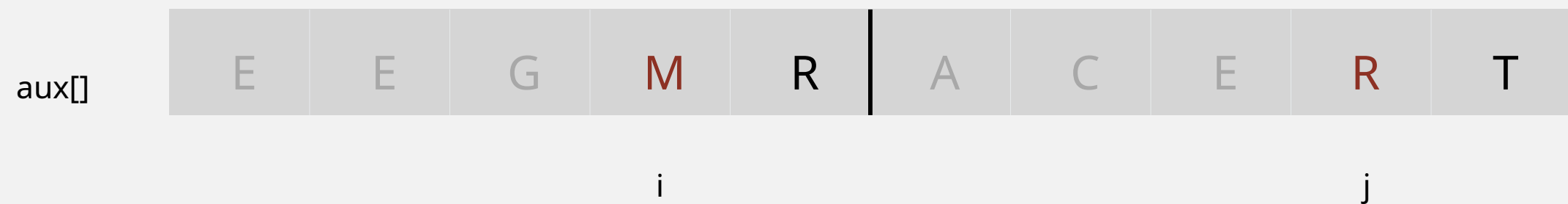


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.

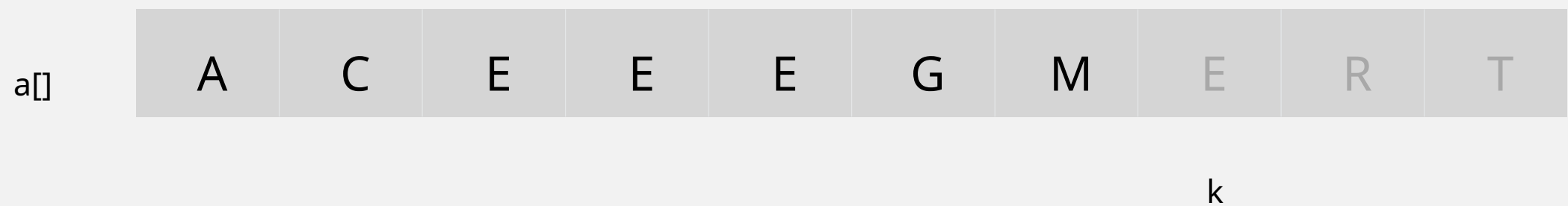


compare minimum in each subarray



Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

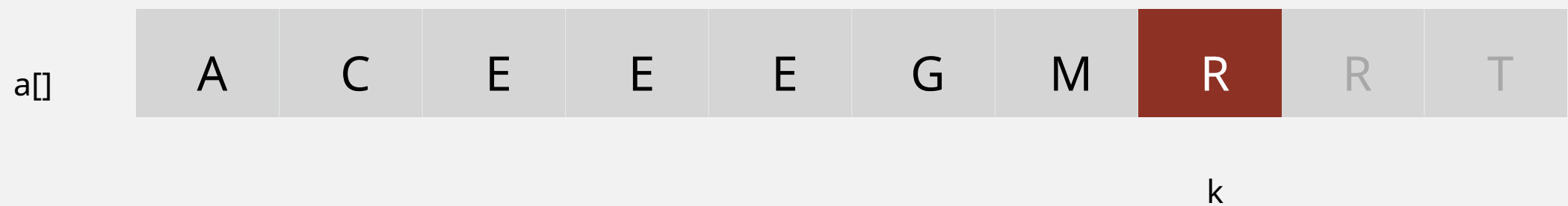


compare minimum in each subarray



Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

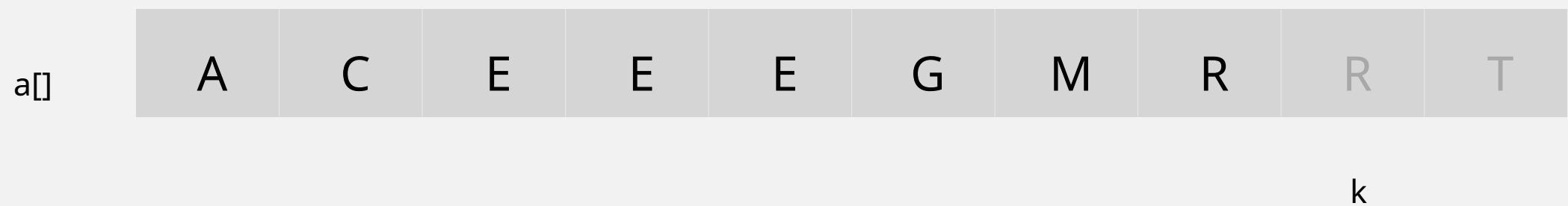


compare minimum in each subarray

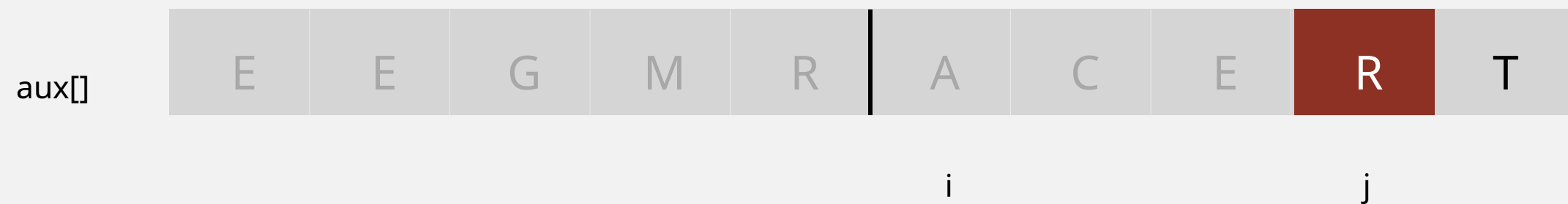


Merging demo

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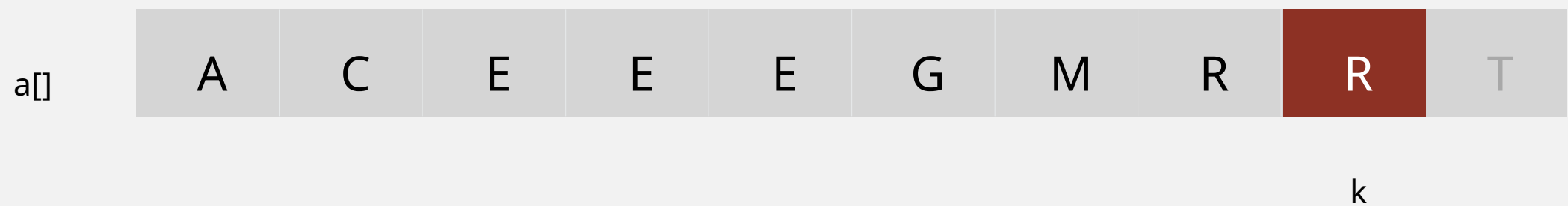


one subarray exhausted, take from other

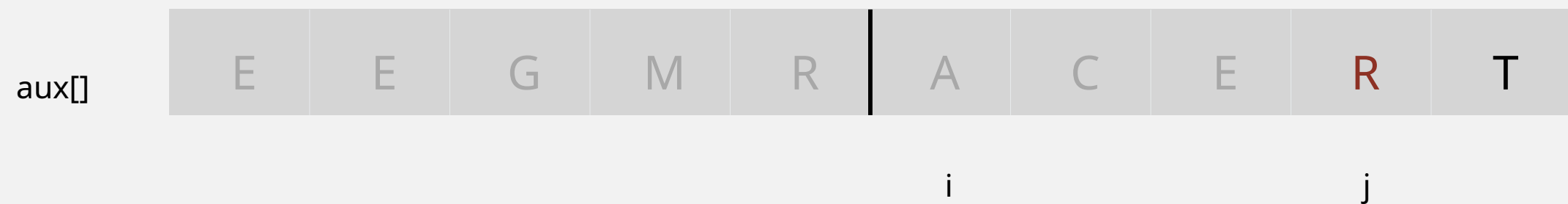


Merging demo

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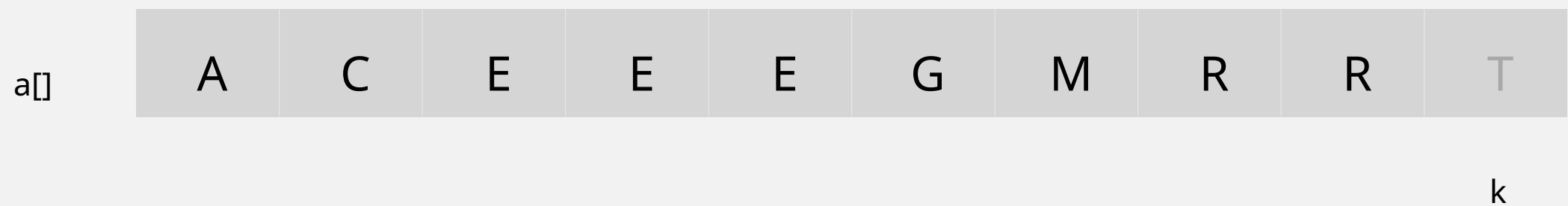


one subarray exhausted, take from other

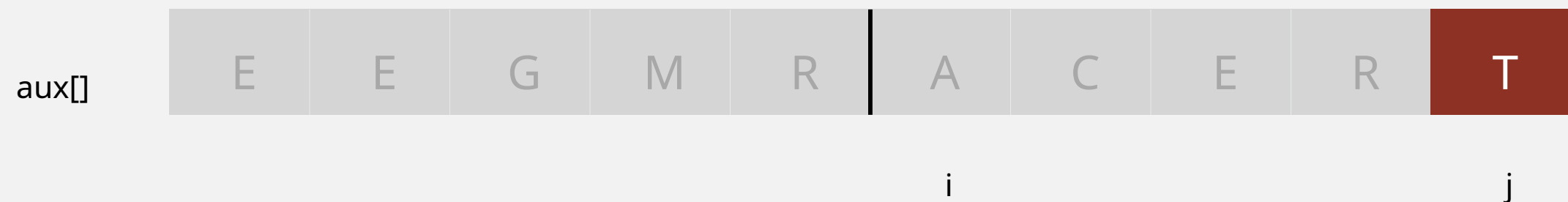


Merging demo

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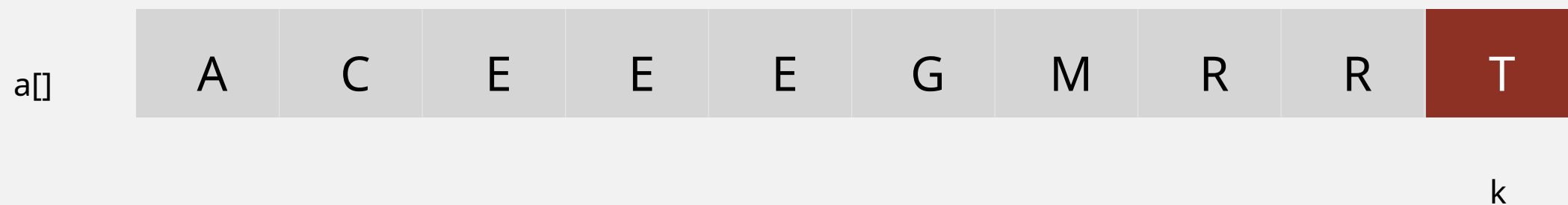


one subarray exhausted, take from other

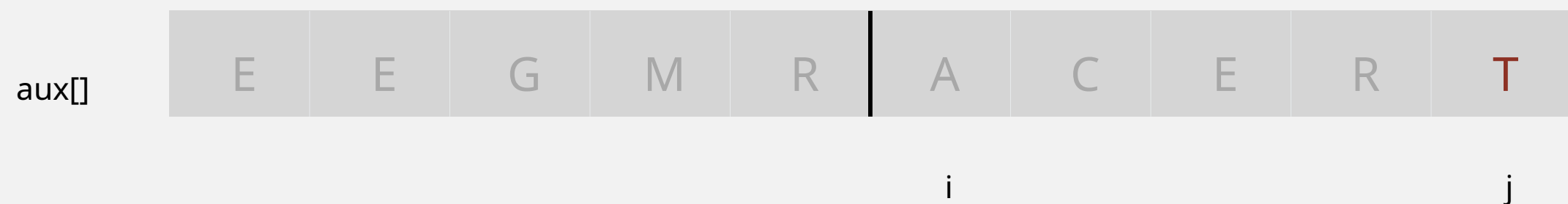


Merging demo

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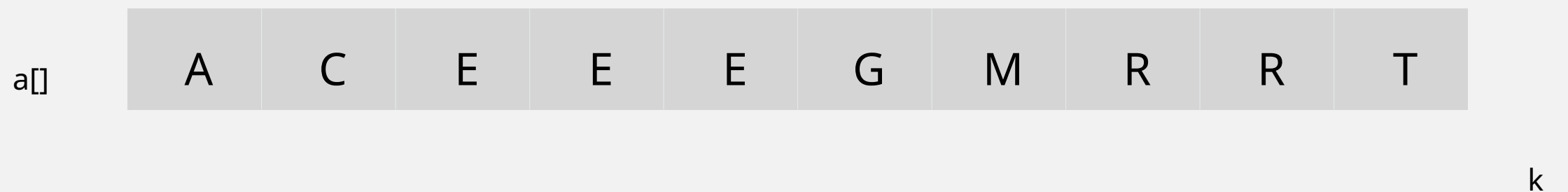


one subarray exhausted, take from other

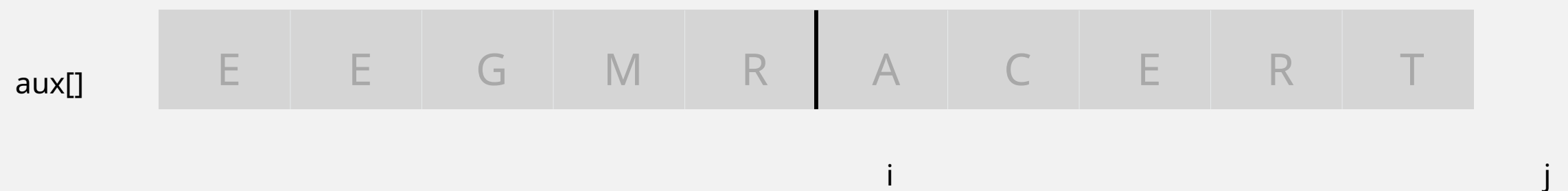


Merging demo

Goal. Given two sorted subarrays $a[lo]$ to $a[mid]$ and $a[mid+1]$ to $a[hi]$, replace with sorted subarray $a[lo]$ to $a[hi]$.



both subarrays exhausted, done



Merging demo

Goal. Given two sorted subarrays $a[\text{lo}]$ to $a[\text{mid}]$ and $a[\text{mid}+1]$ to $a[\text{hi}]$, replace with sorted subarray $a[\text{lo}]$ to $a[\text{hi}]$.

