



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

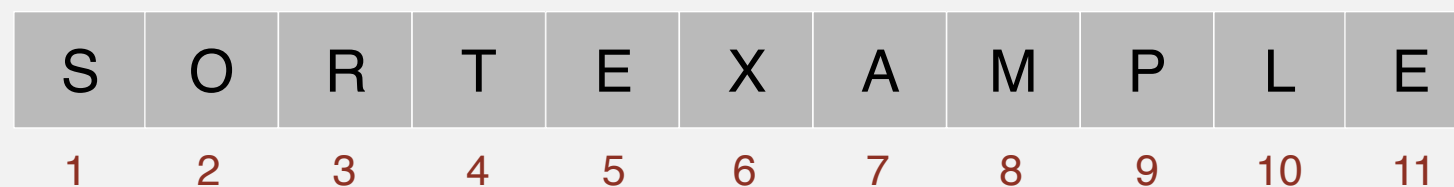
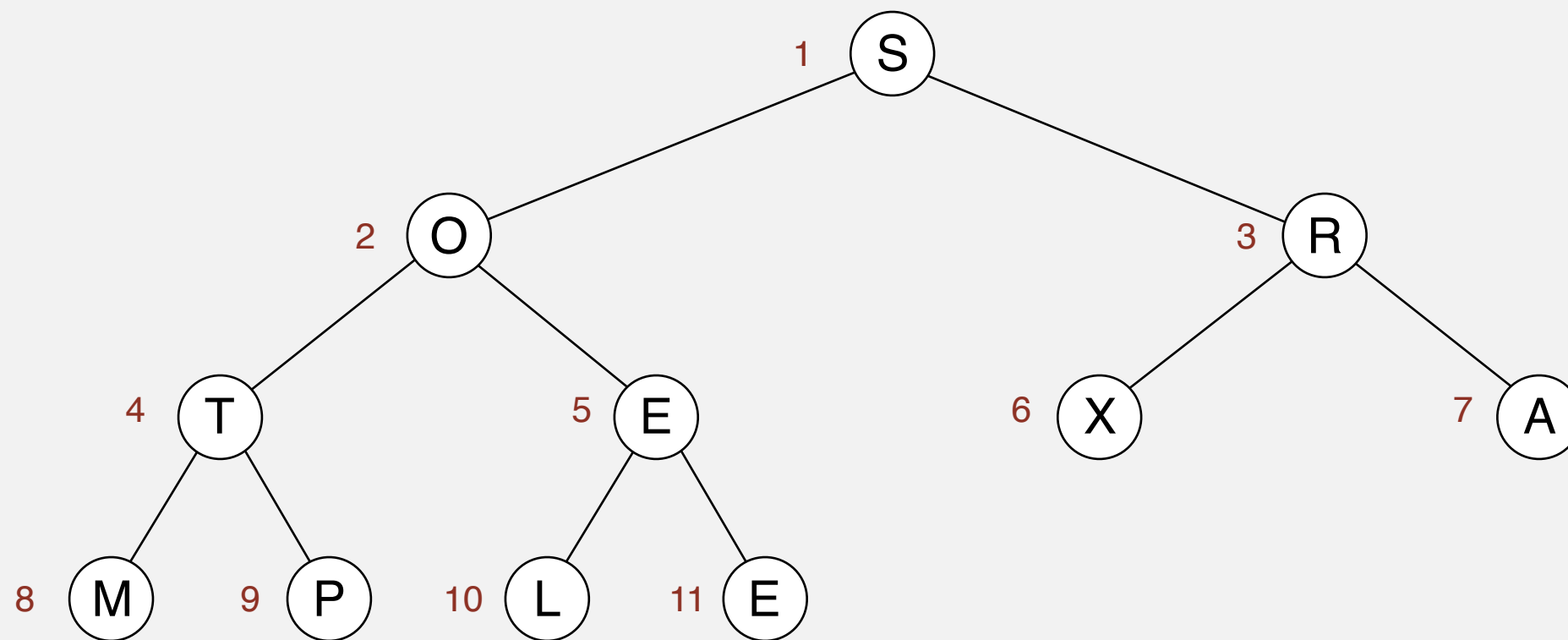
2.4 HEAPSORT DEMO

Heapsort demo

Heap construction. Build max heap using bottom-up method.

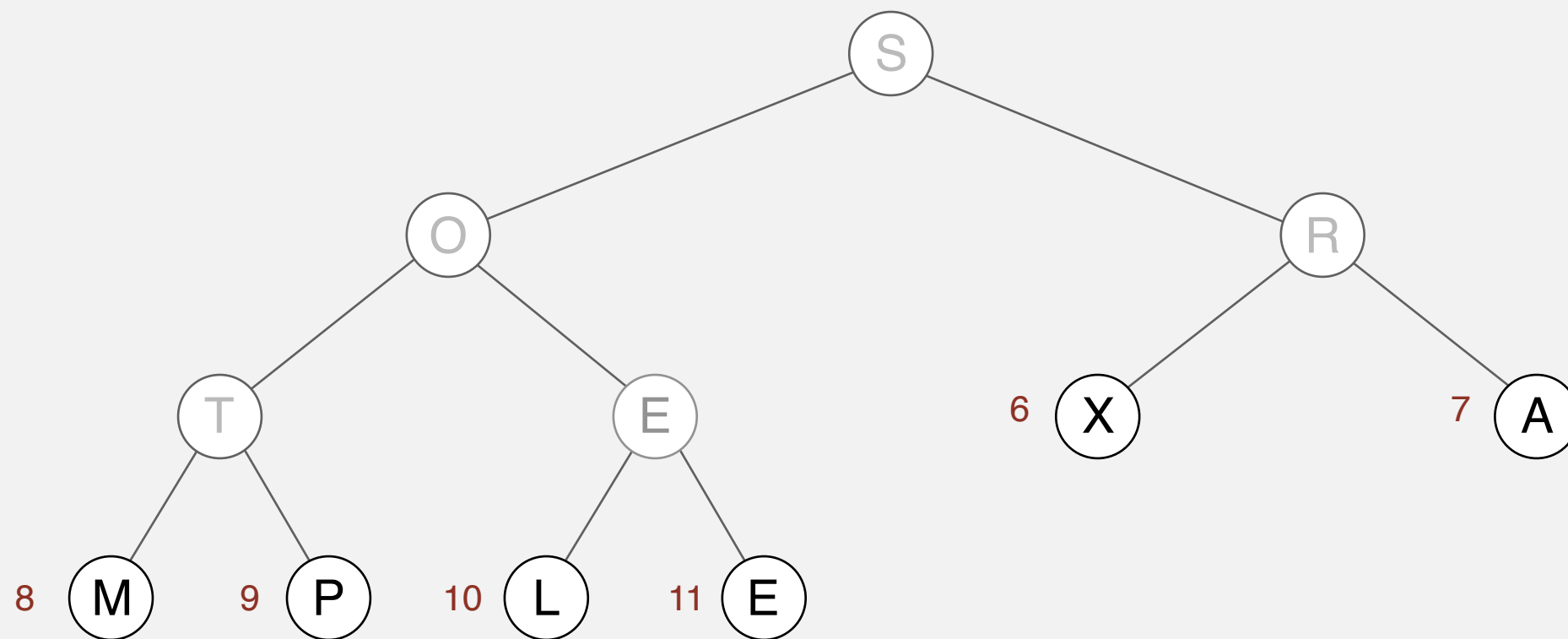
we assume array entries are indexed 1 to N

array in arbitrary order



Heapsort demo

Heap construction. Build max heap using bottom-up method.

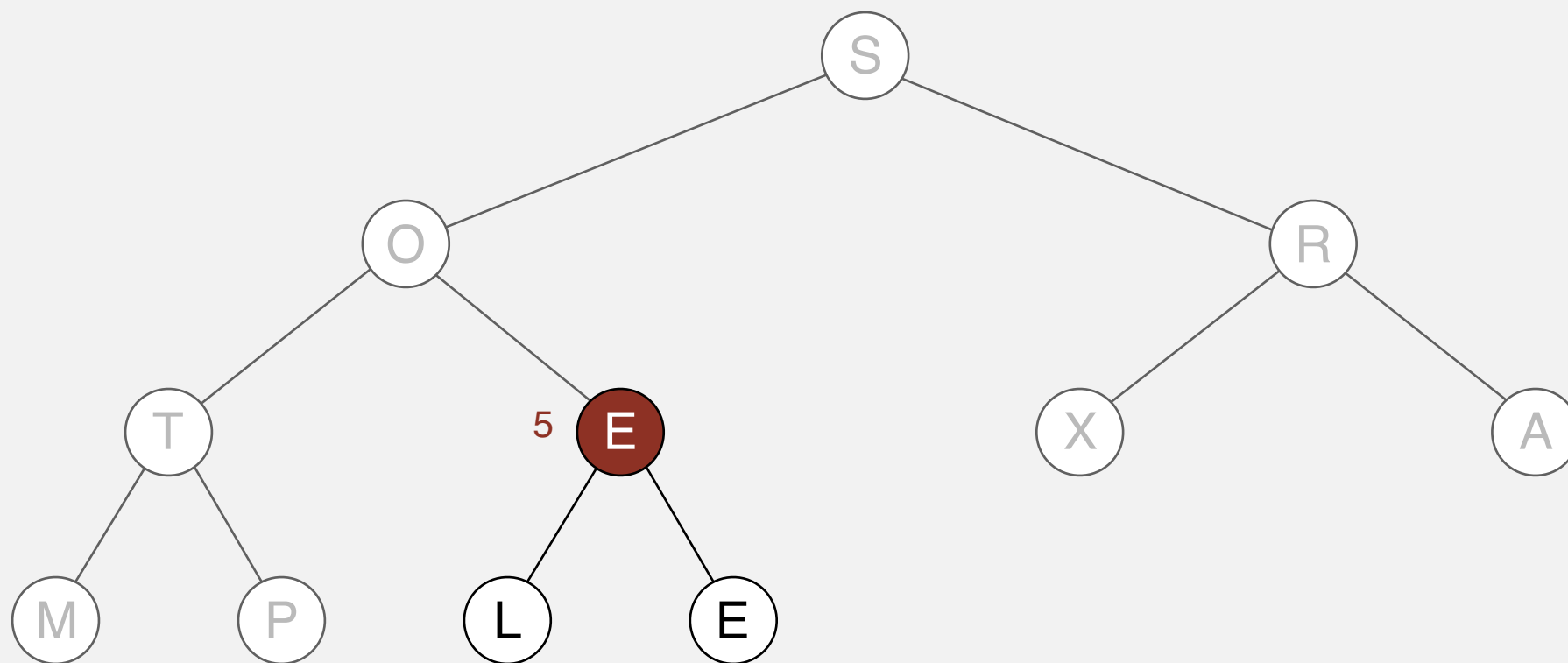


Heapsort demo

Heap construction. Build max heap using bottom-up method.

Why 5? Because it is the half-way position

sink 5

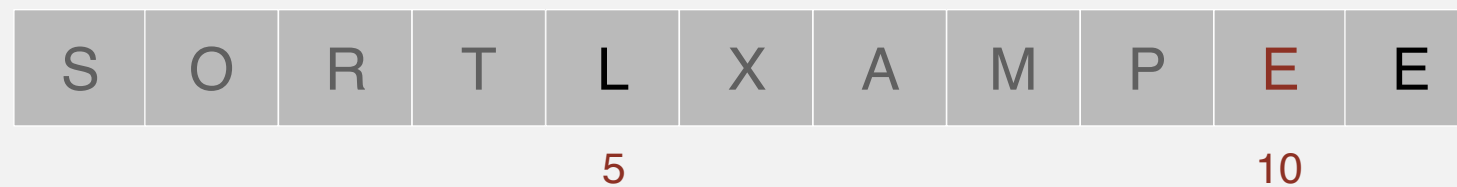
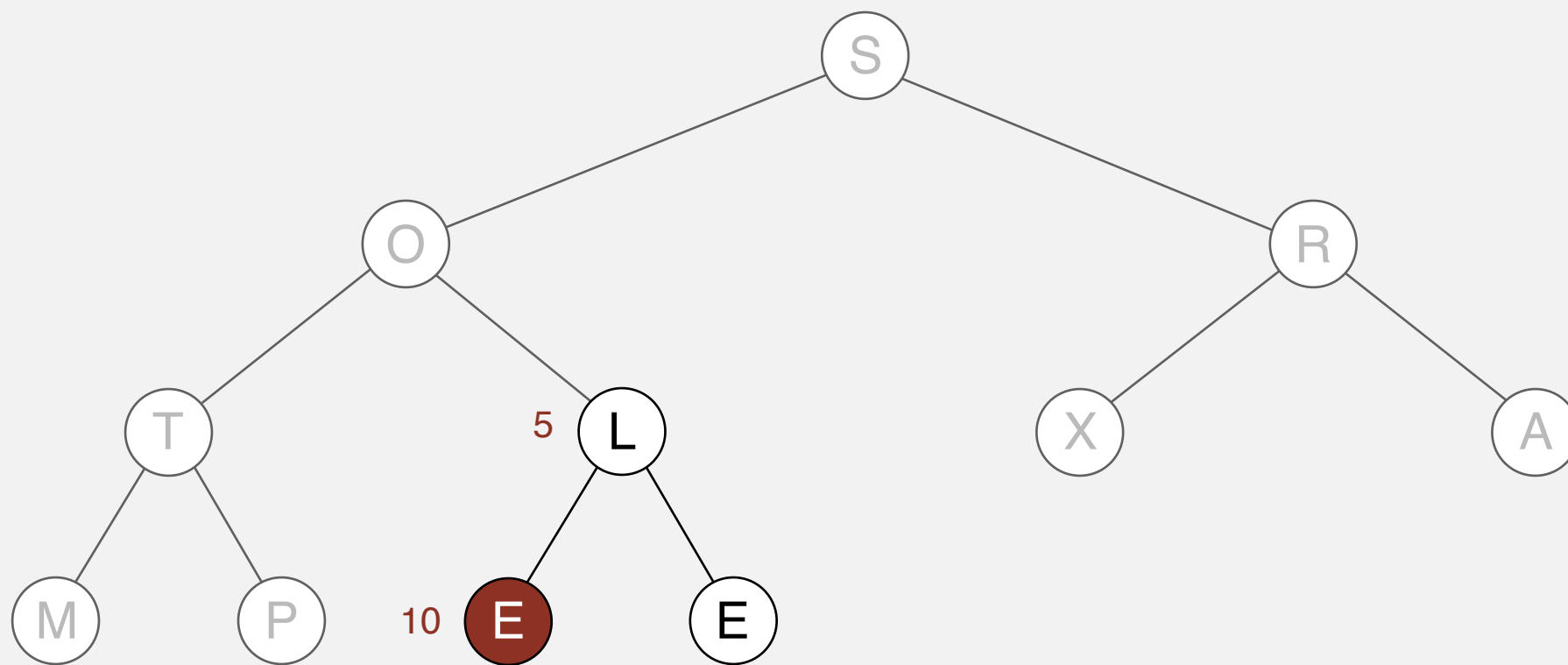


S	O	R	T	E	X	A	M	P	L	E
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Heapsort demo

Heap construction. Build max heap using bottom-up method.

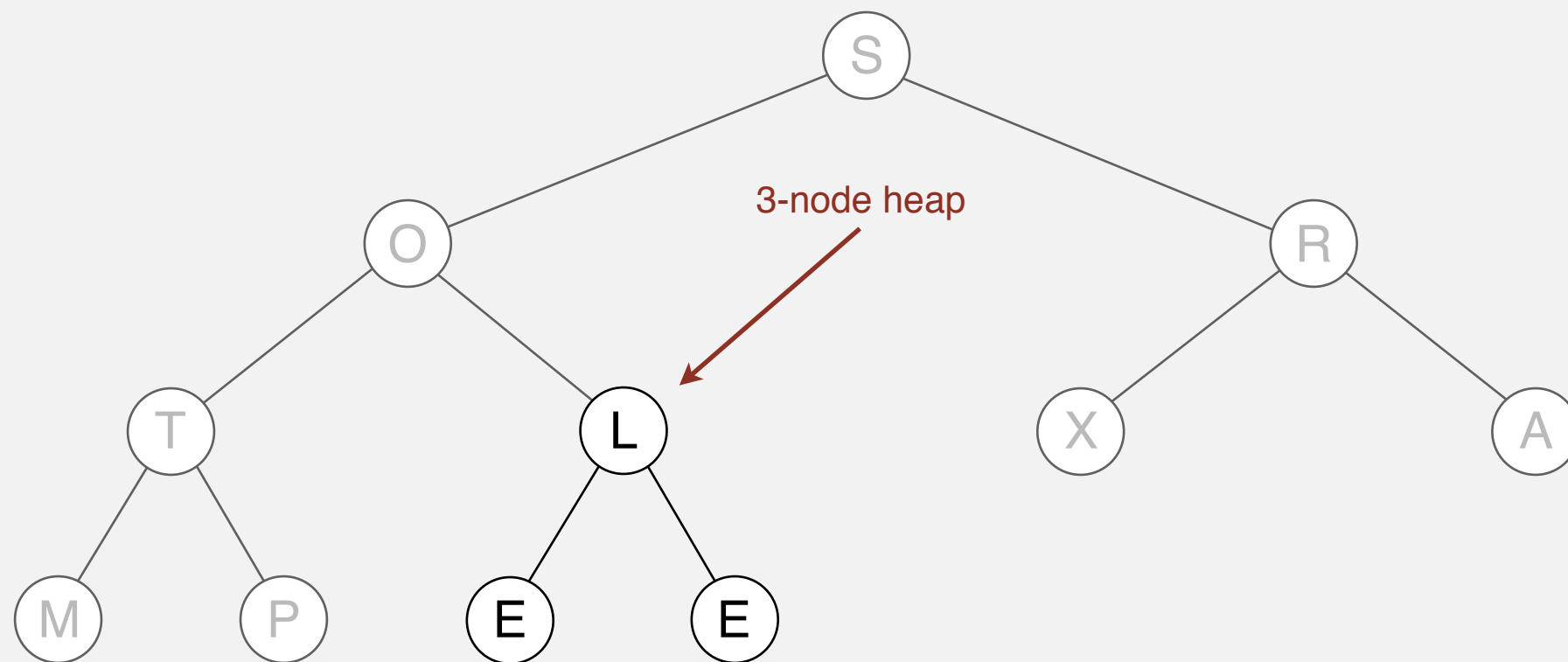
sink 5



Heapsort demo

Heap construction. Build max heap using bottom-up method.

sink 5

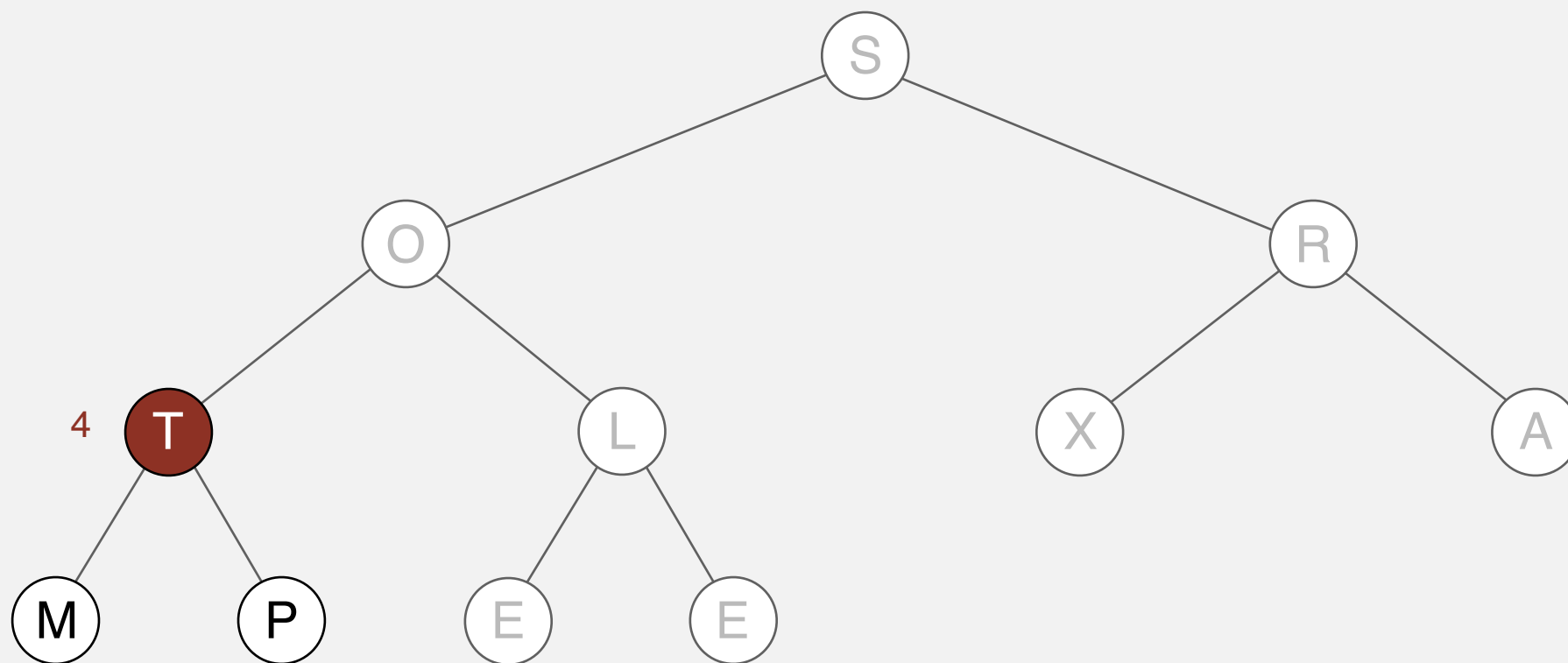


S	O	R	T	L	X	A	M	P	E	E
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Heapsort demo

Heap construction. Build max heap using bottom-up method.

sink 4



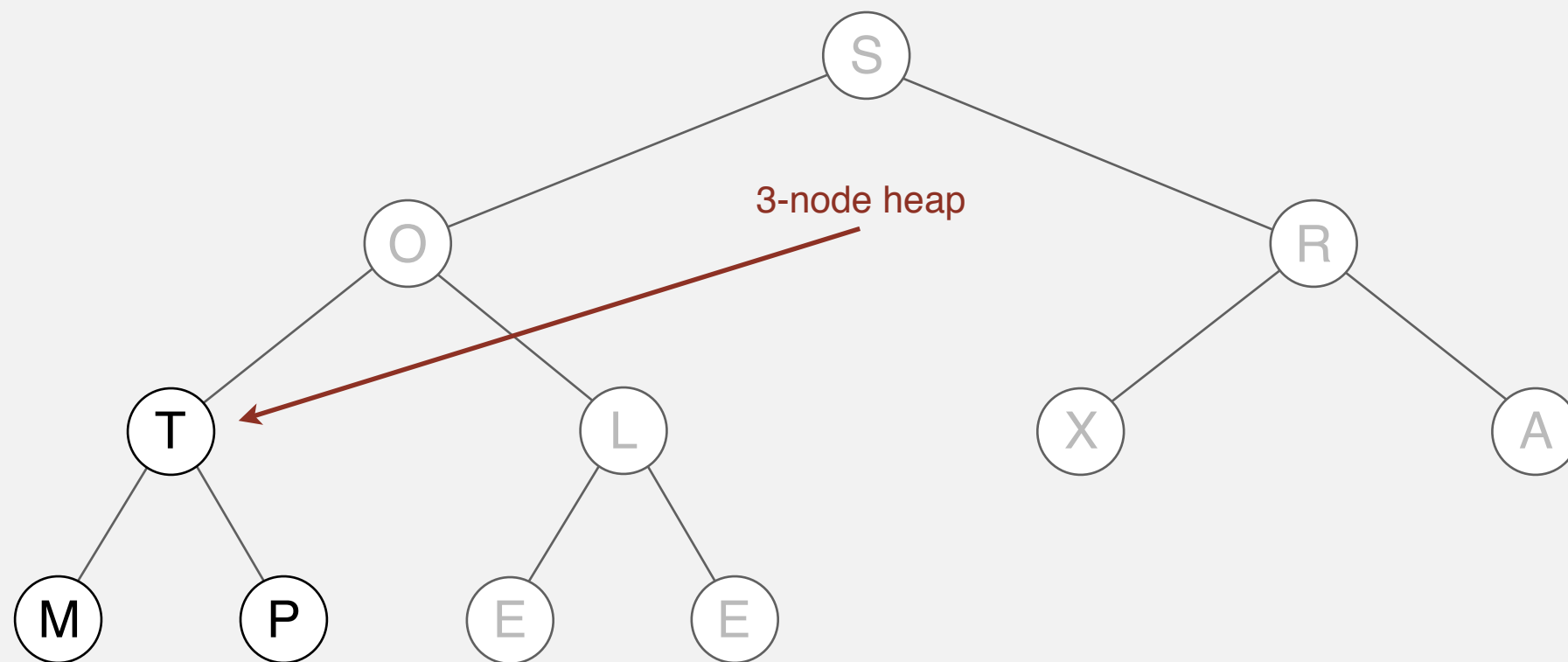
S	O	R	T	L	X	A	M	P	E	E
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4

Heapsort demo

Heap construction. Build max heap using bottom-up method.

sink 4

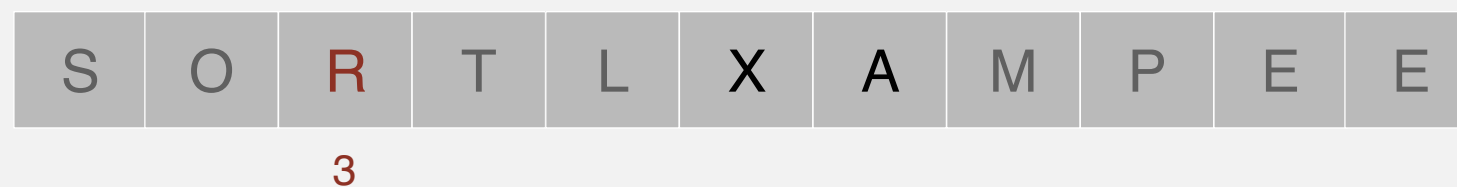
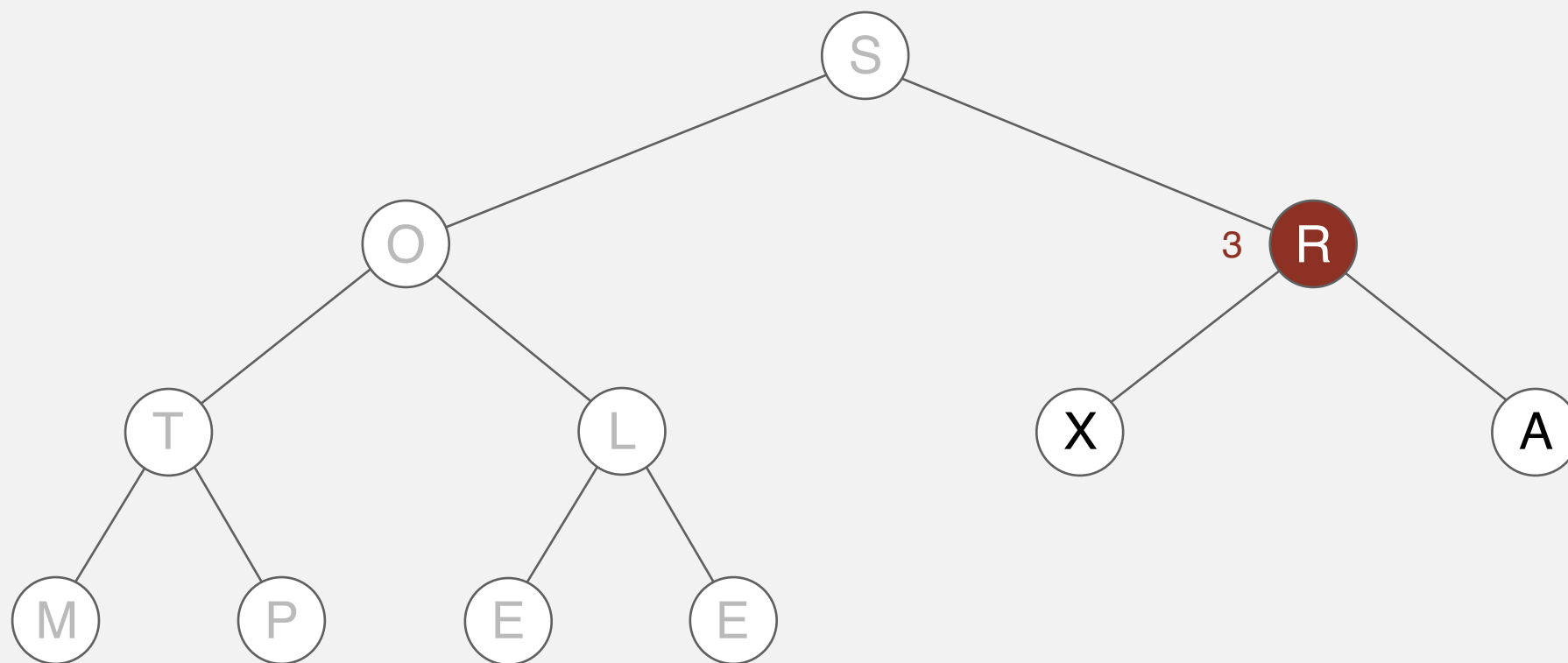


S	O	R	T	L	X	A	M	P	E	E
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Heapsort demo

Heap construction. Build max heap using bottom-up method.

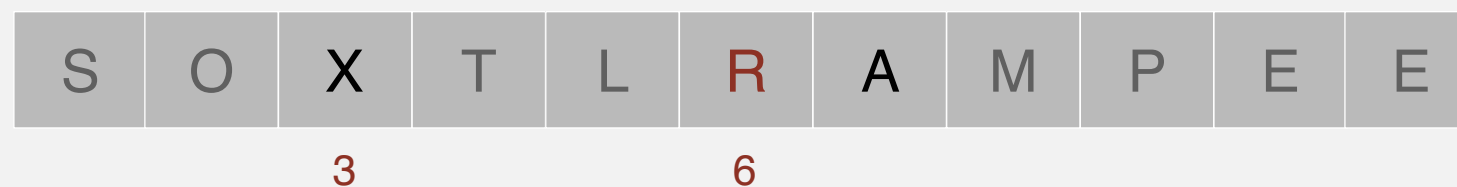
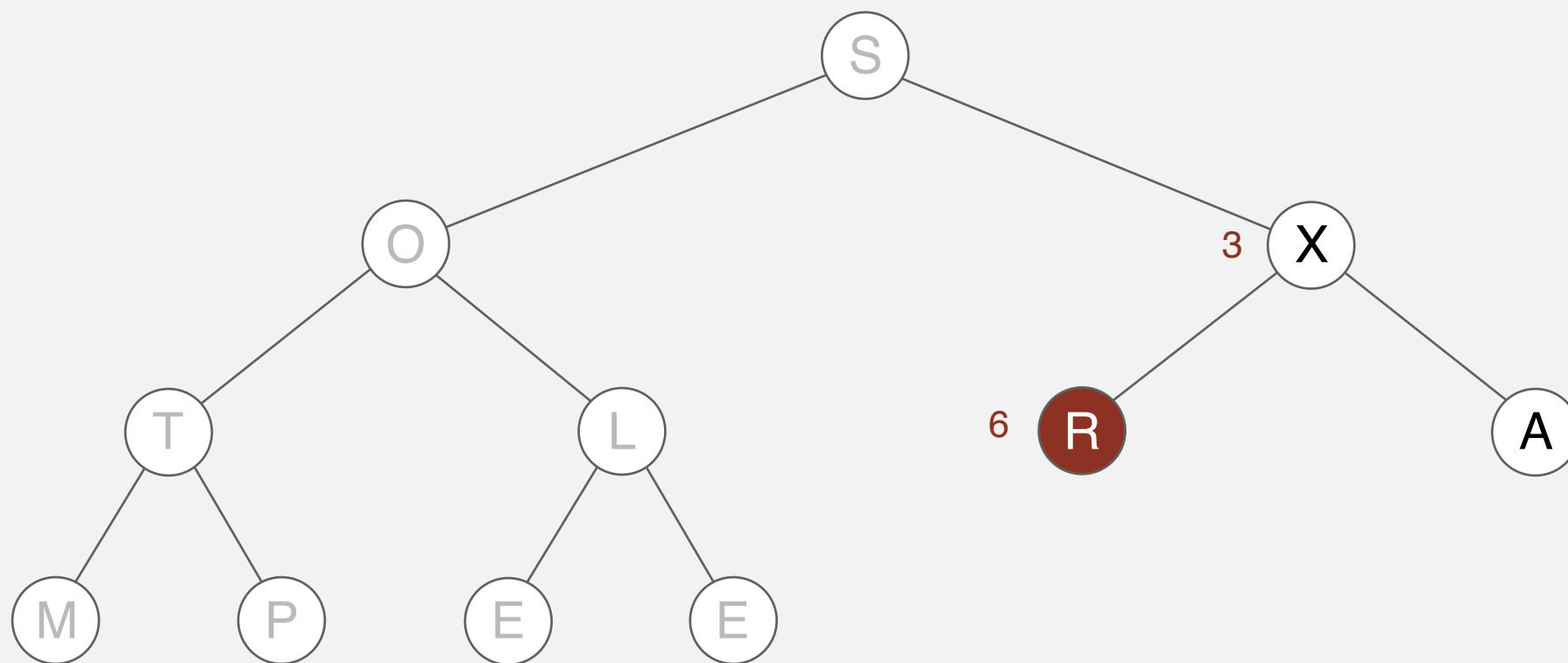
sink 3



Heapsort demo

Heap construction. Build max heap using bottom-up method.

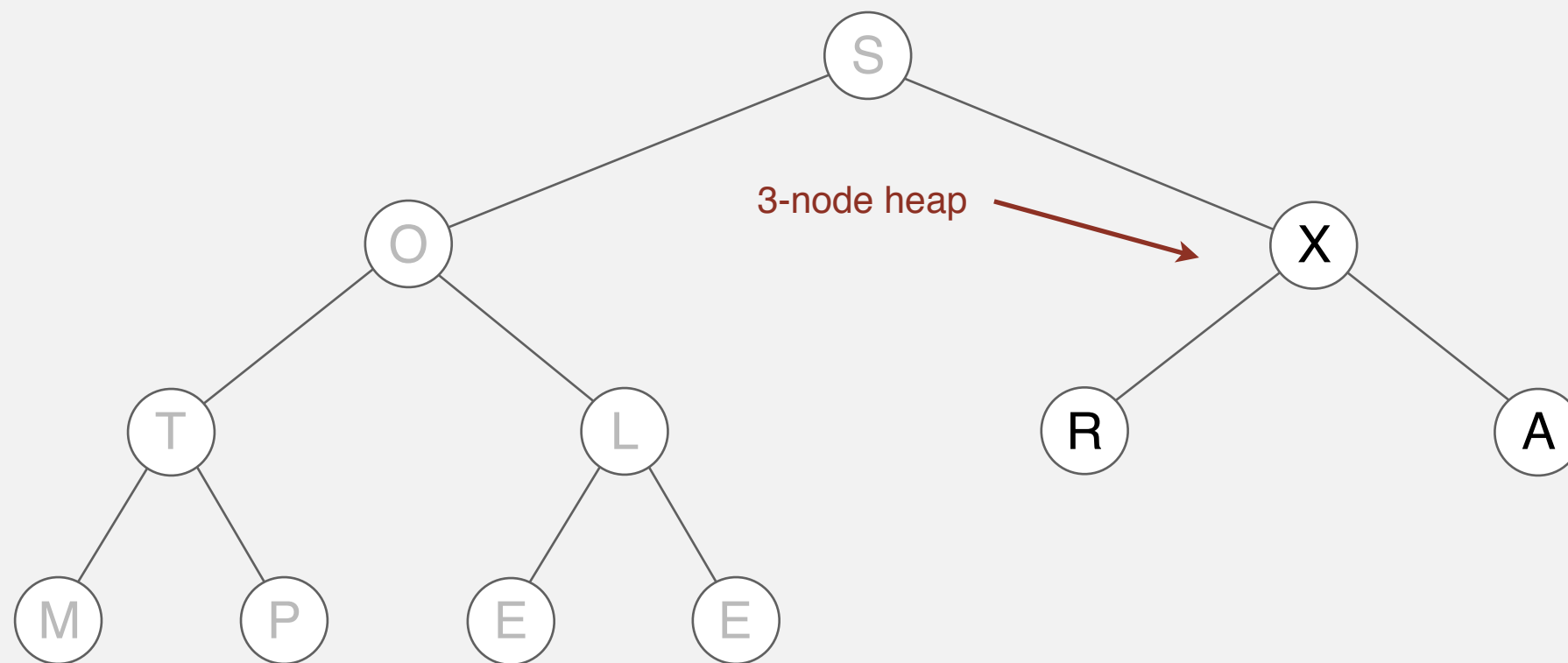
sink 3



Heapsort demo

Heap construction. Build max heap using bottom-up method.

sink 3

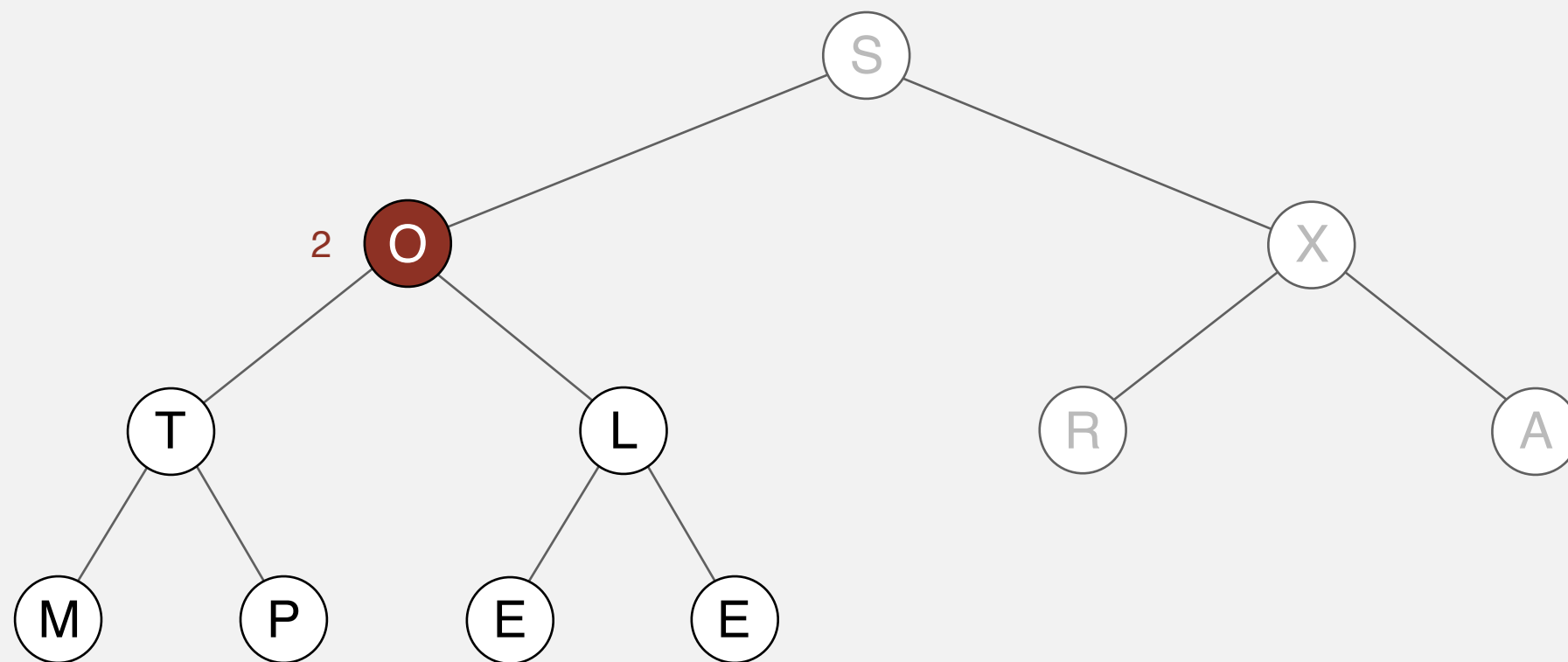


S	O	X	T	L	A	A	M	P	E	E
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Heapsort demo

Heap construction. Build max heap using bottom-up method.

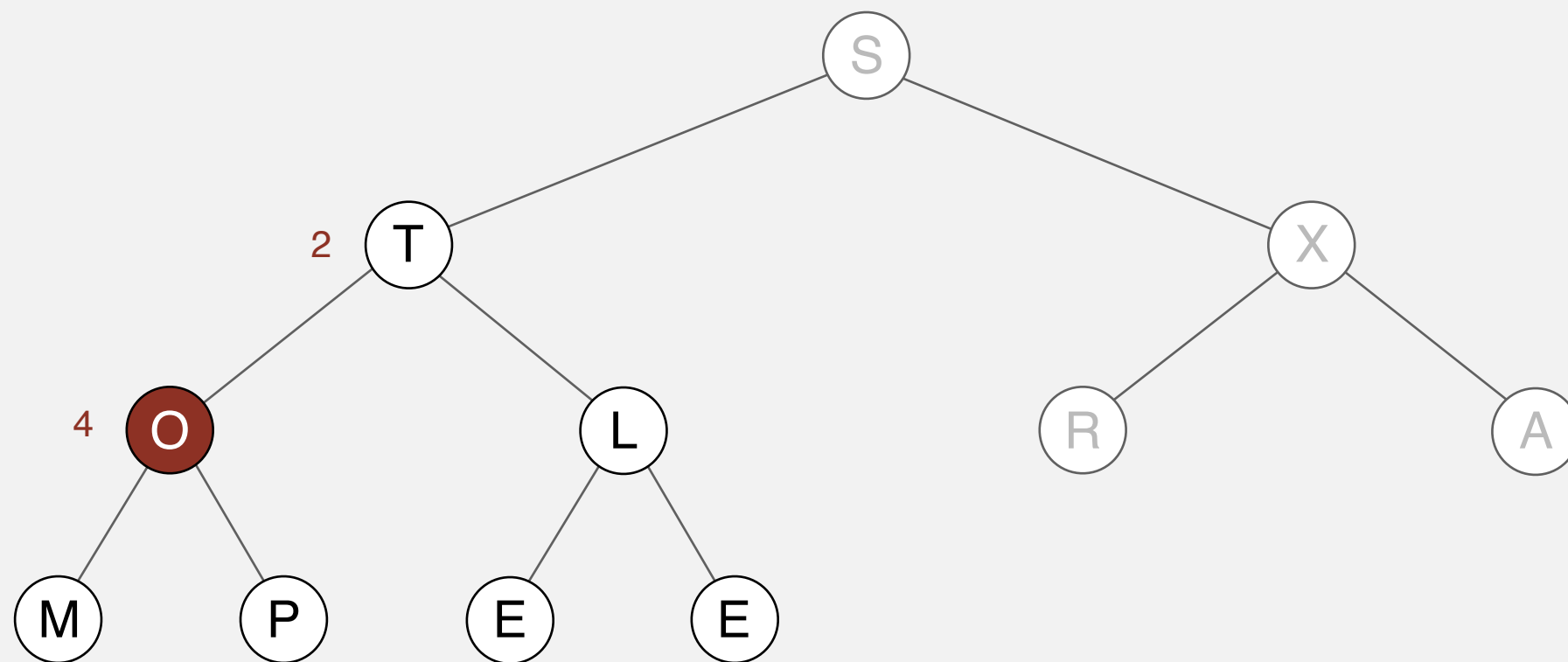
sink 2



Heapsort demo

Heap construction. Build max heap using bottom-up method.

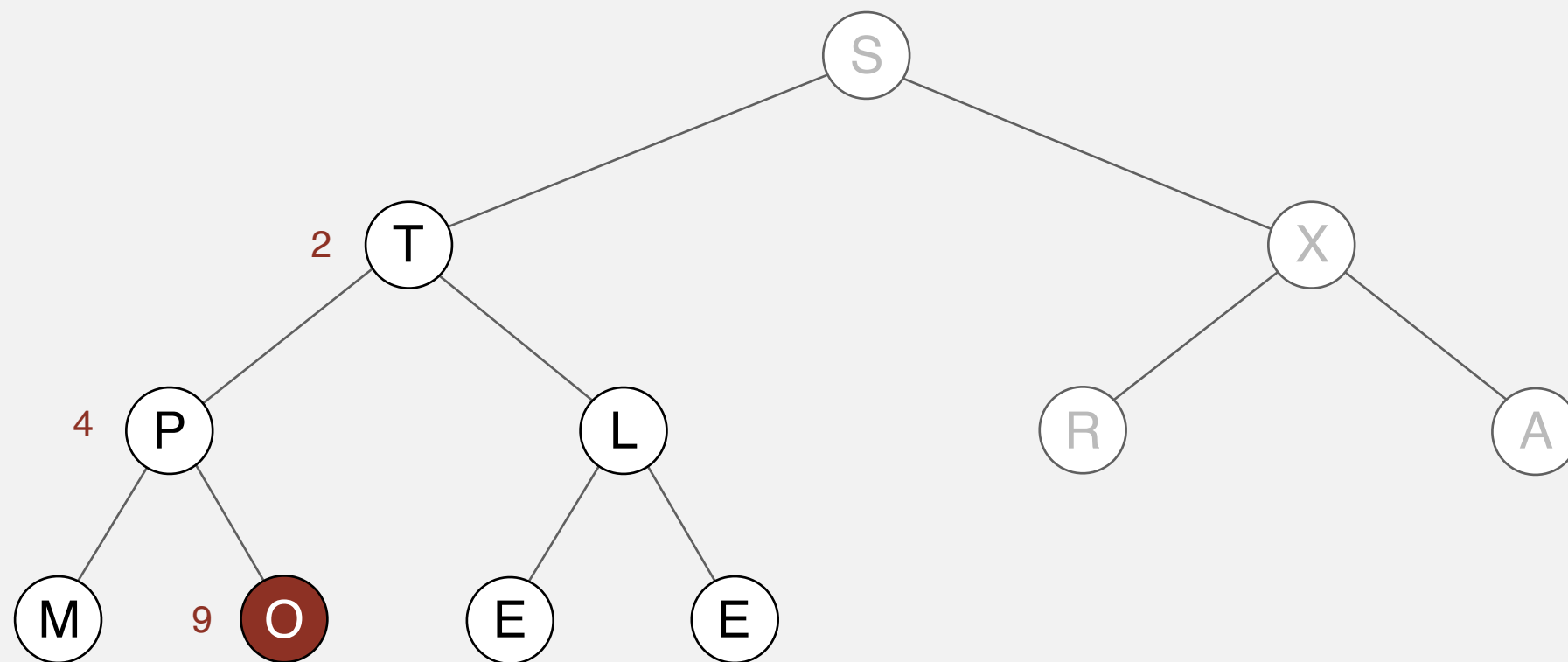
sink 2



Heapsort demo

Heap construction. Build max heap using bottom-up method.

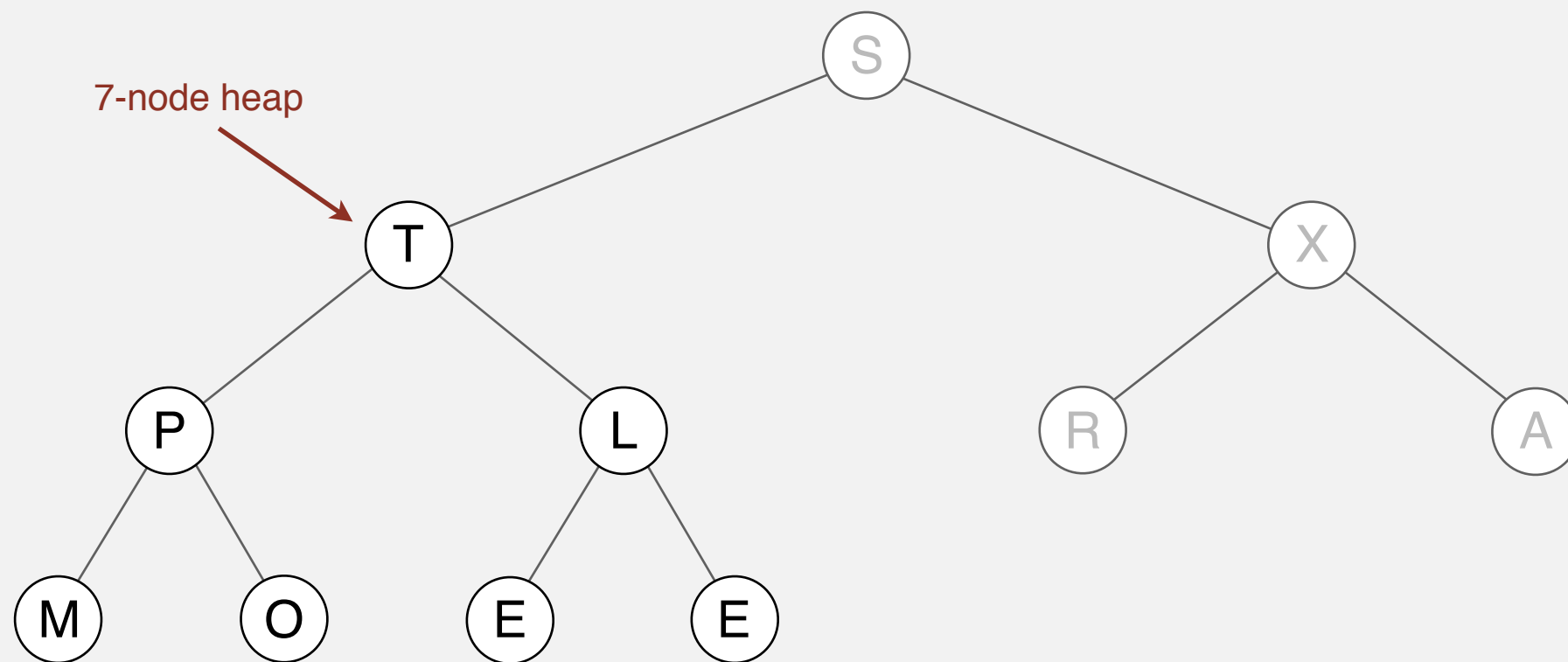
sink 2



Heapsort demo

Heap construction. Build max heap using bottom-up method.

sink 2

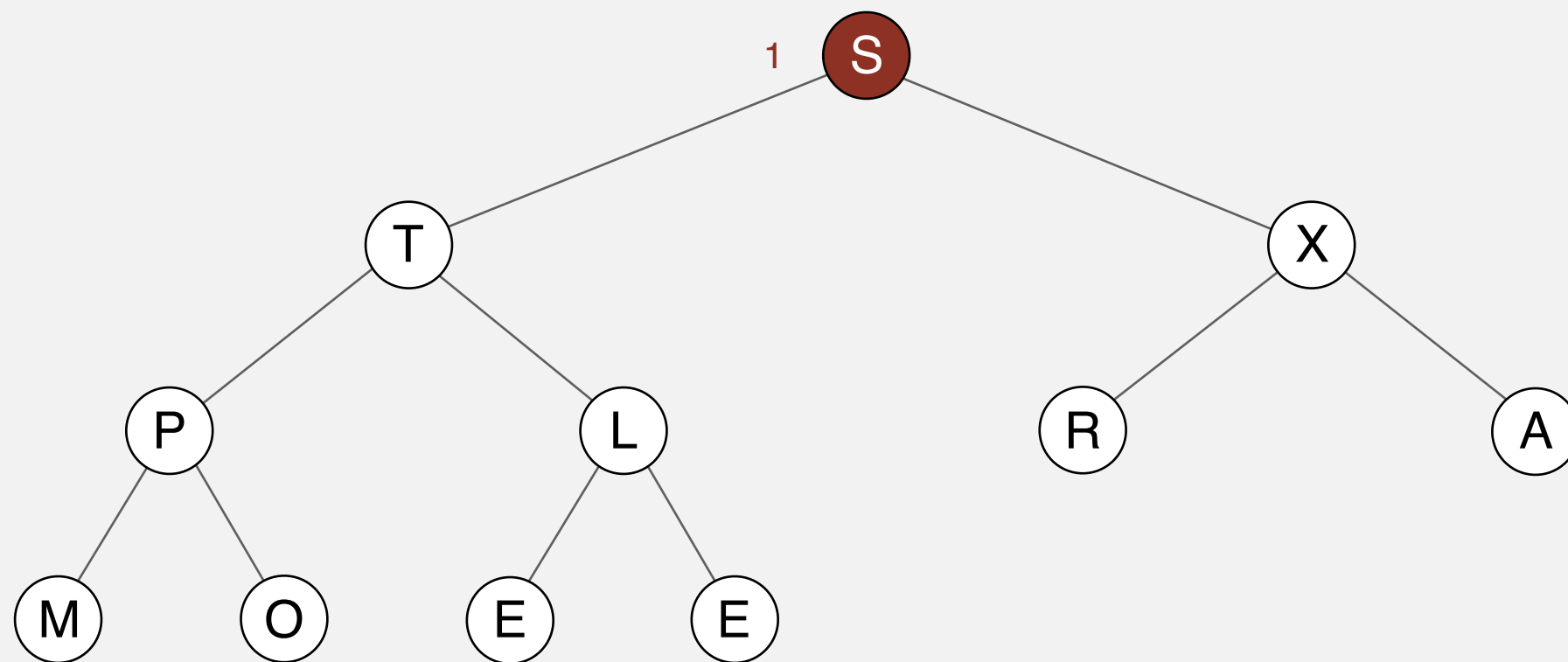


S	T	X	P	L	R	A	M	O	E	E
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Heapsort demo

Heap construction. Build max heap using bottom-up method.

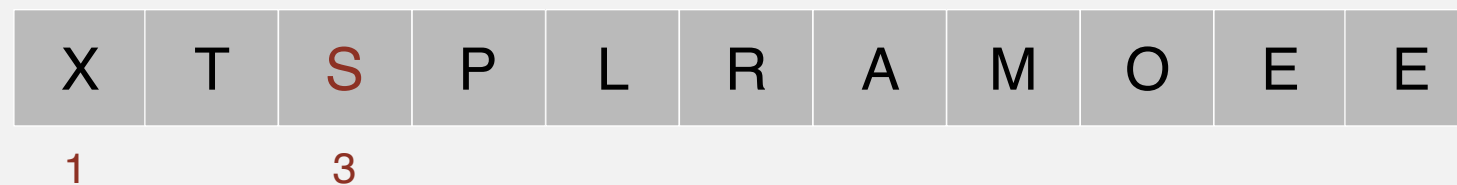
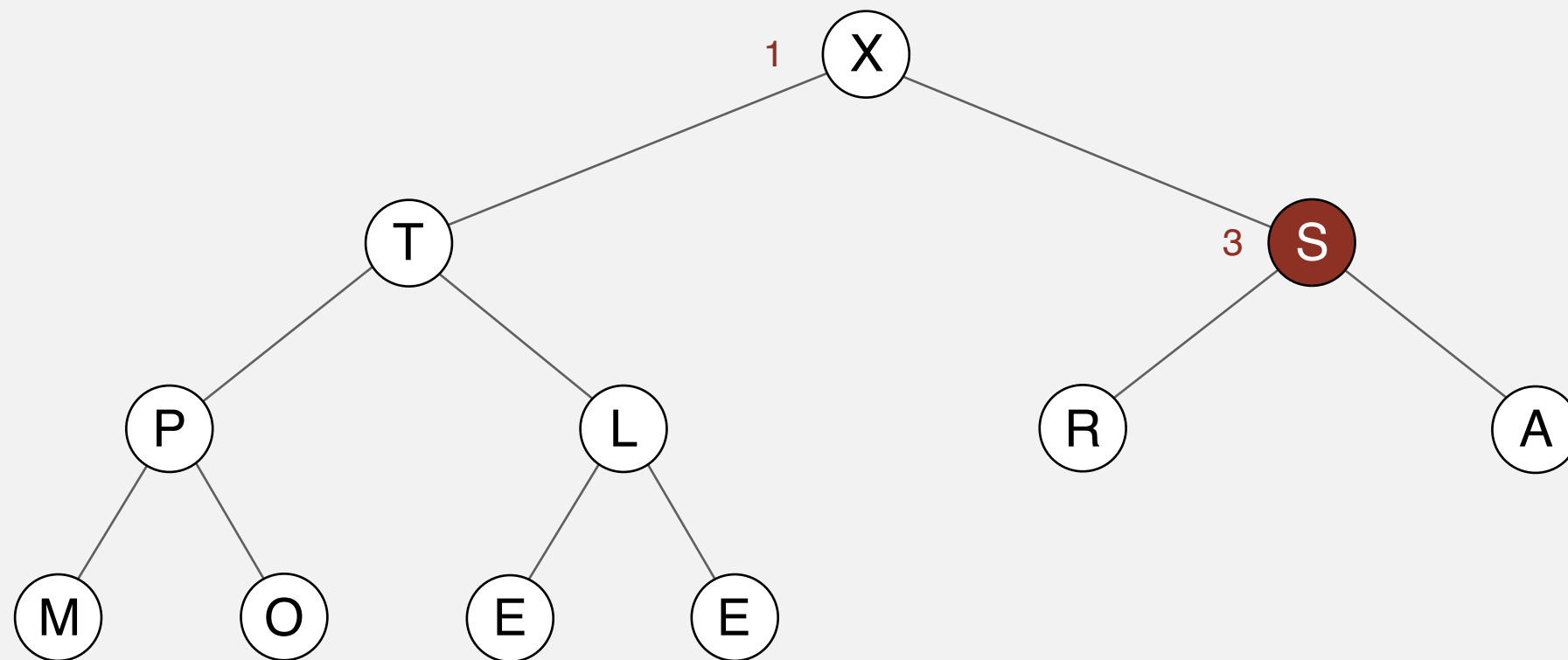
sink 1



Heapsort demo

Heap construction. Build max heap using bottom-up method.

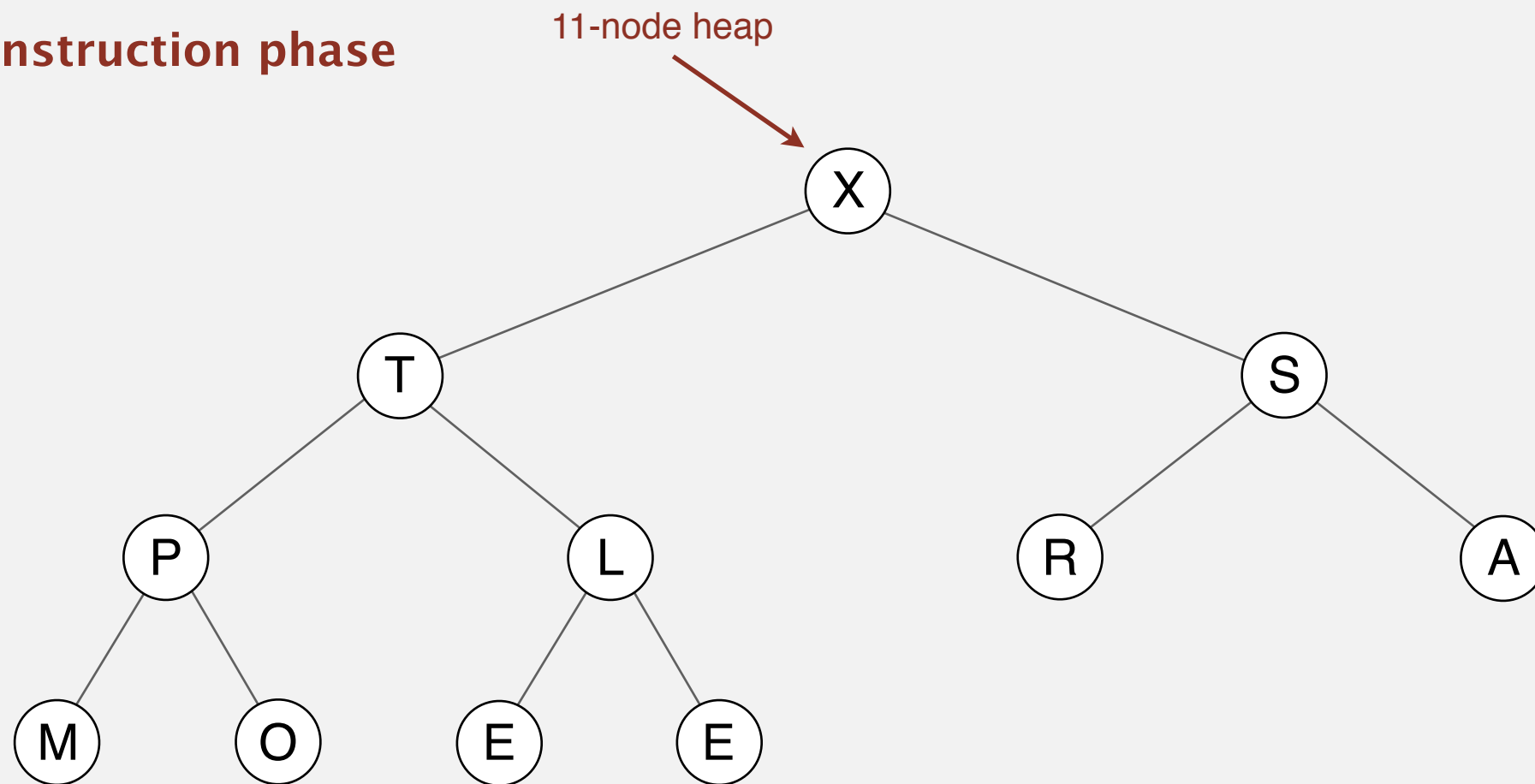
sink 1



Heapsort demo

Heap construction. Build max heap using bottom-up method.

end of construction phase



X	T	S	P	L	R	A	M	O	E	E
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Sortdown. Repeatedly delete the largest remaining item.

exchange 1 and 11



Sortdown. Repeatedly delete the largest remaining item.

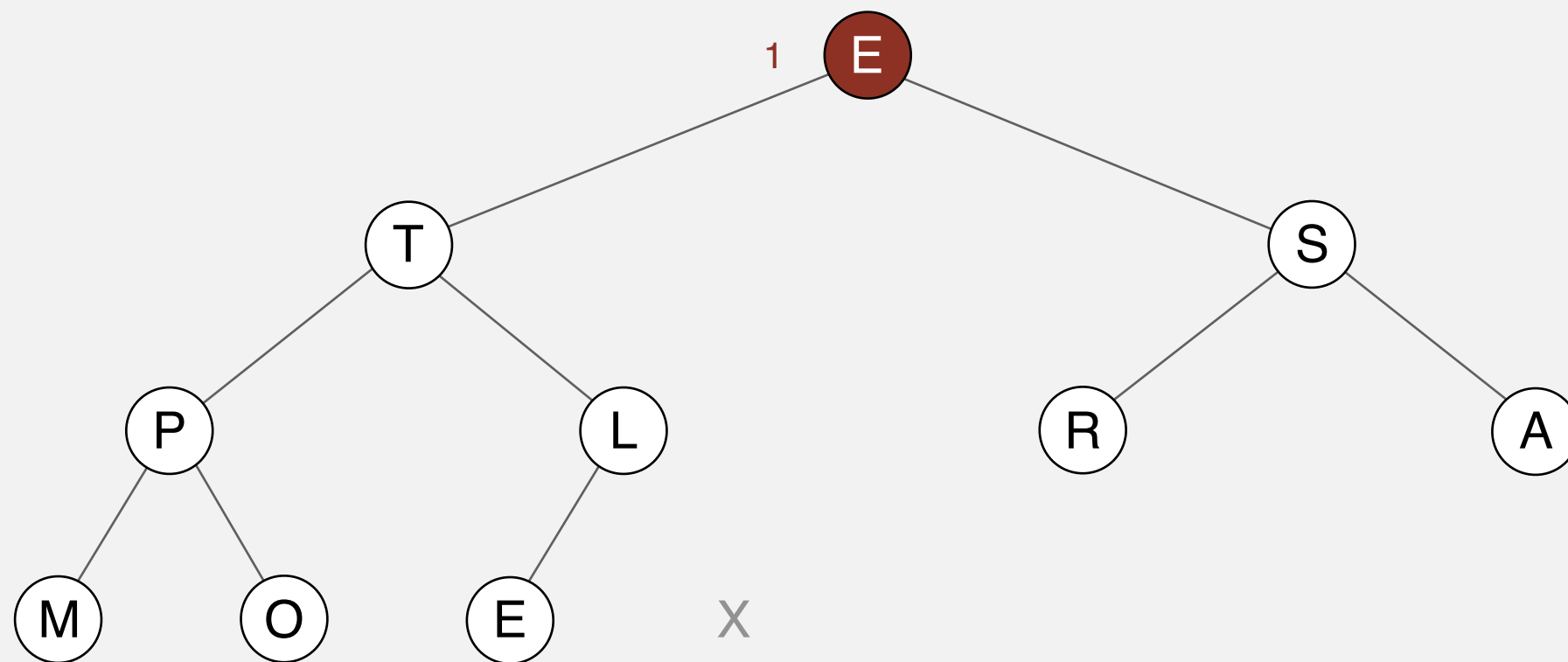
exchange 1 and 11



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

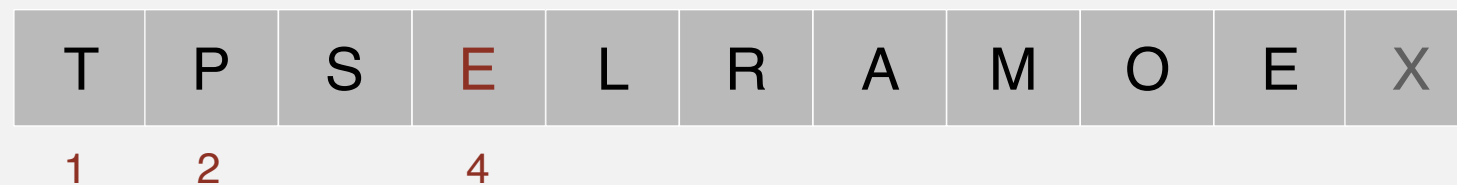
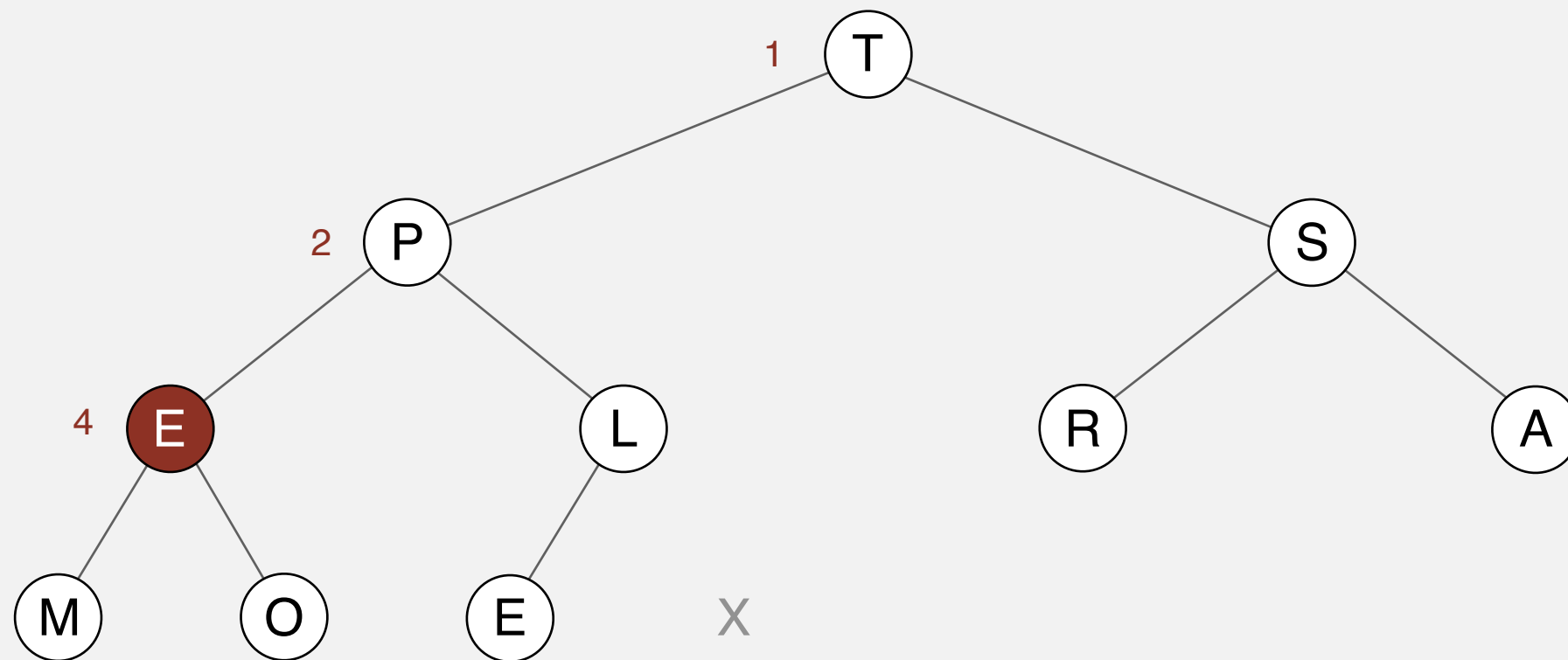
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

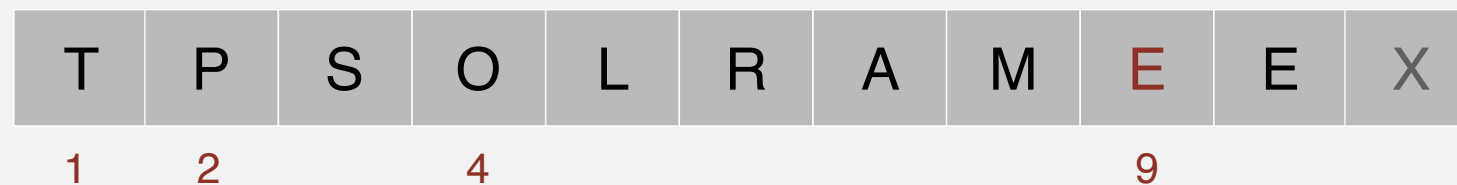
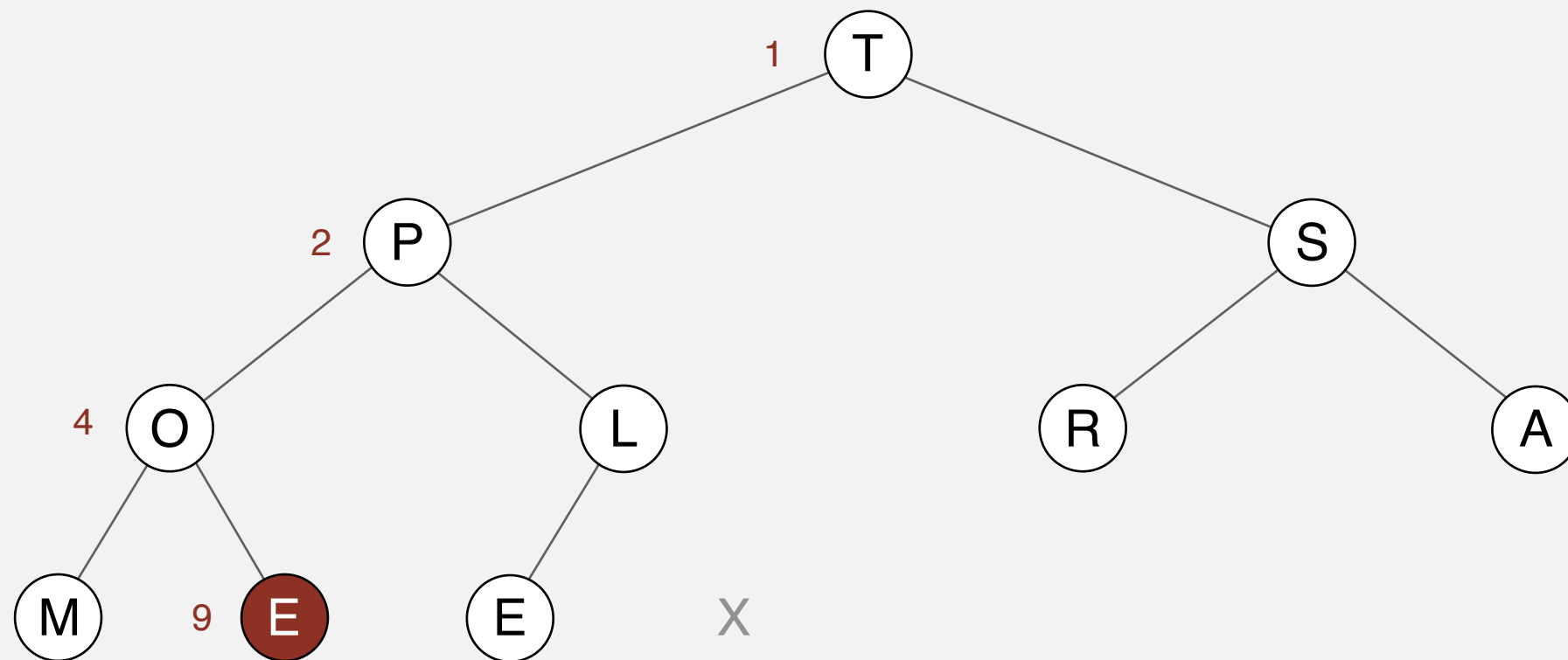
sink 1



Heapsort demo

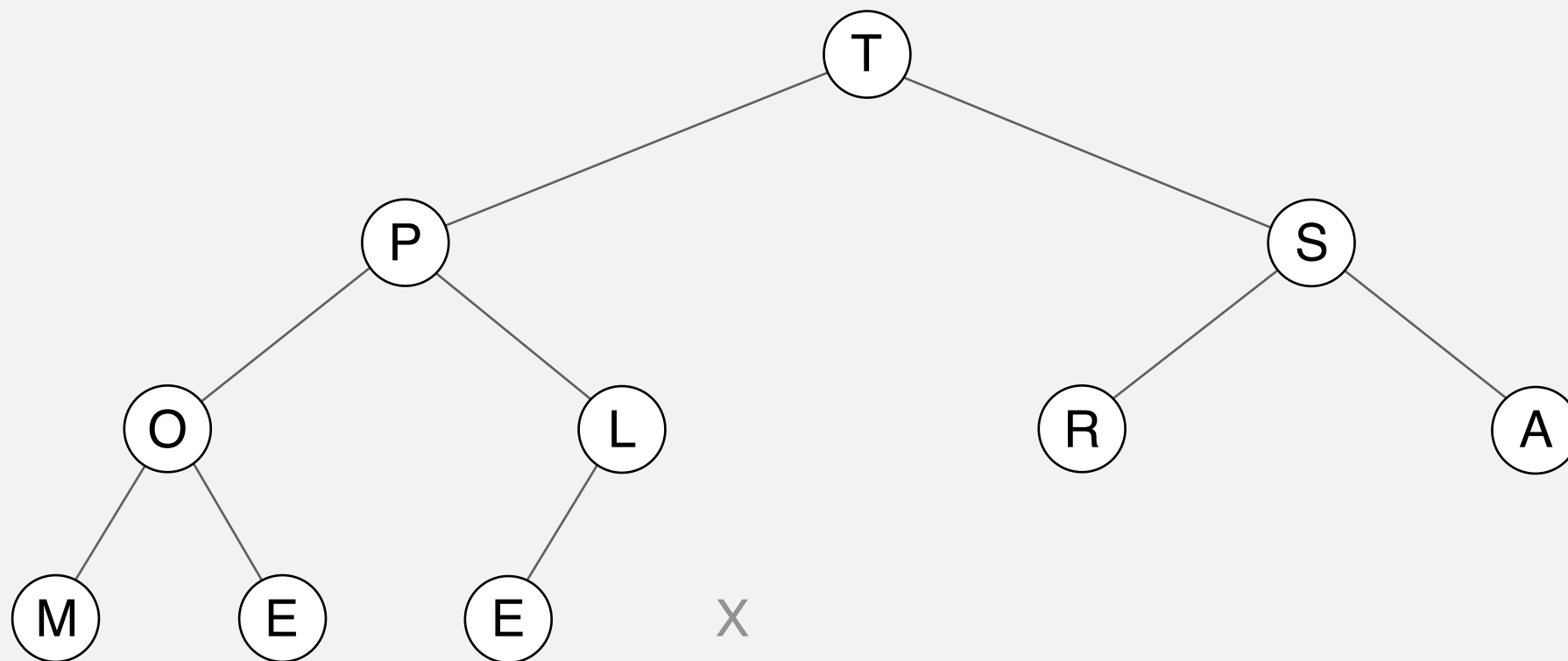
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.



T	P	S	O	L	R	A	M	E	E	X
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Sortdown. Repeatedly delete the largest remaining item.

exchange 1 and 10



Sortdown. Repeatedly delete the largest remaining item.

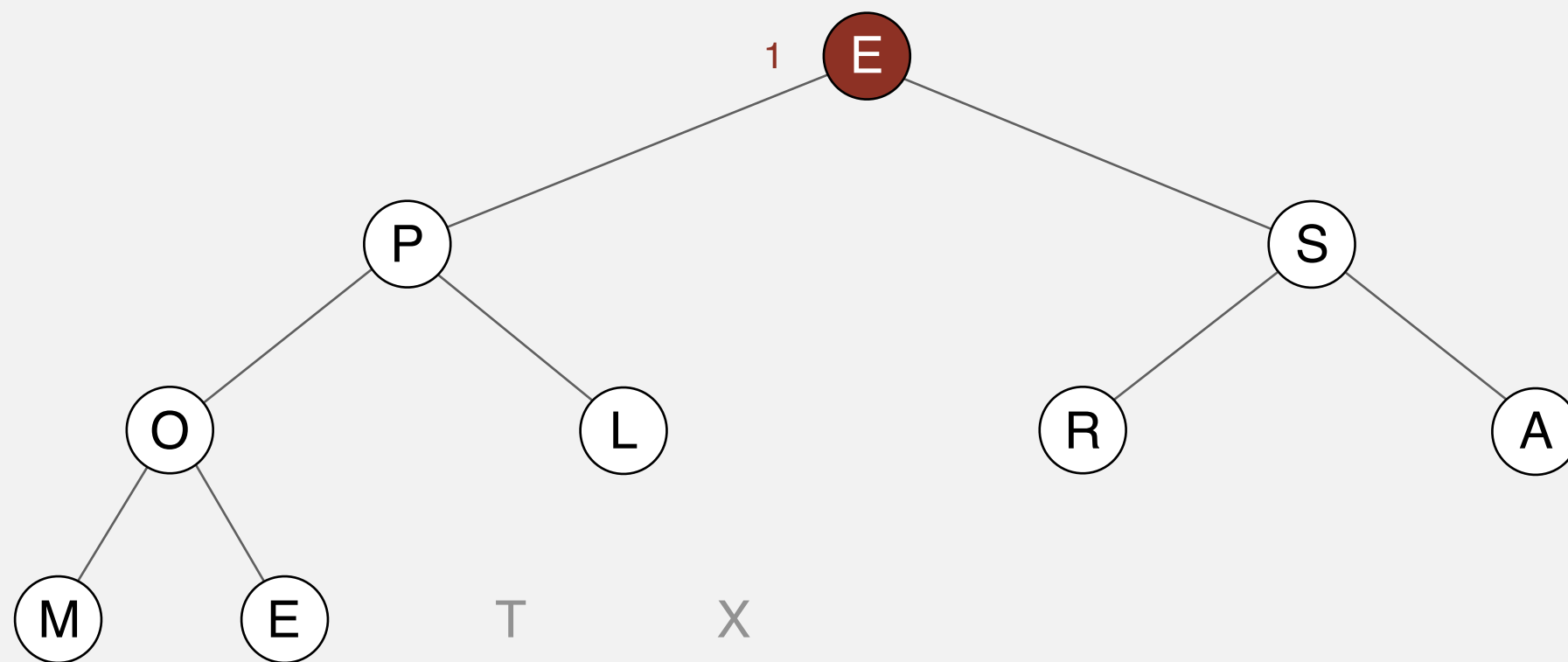
exchange 1 and 10



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

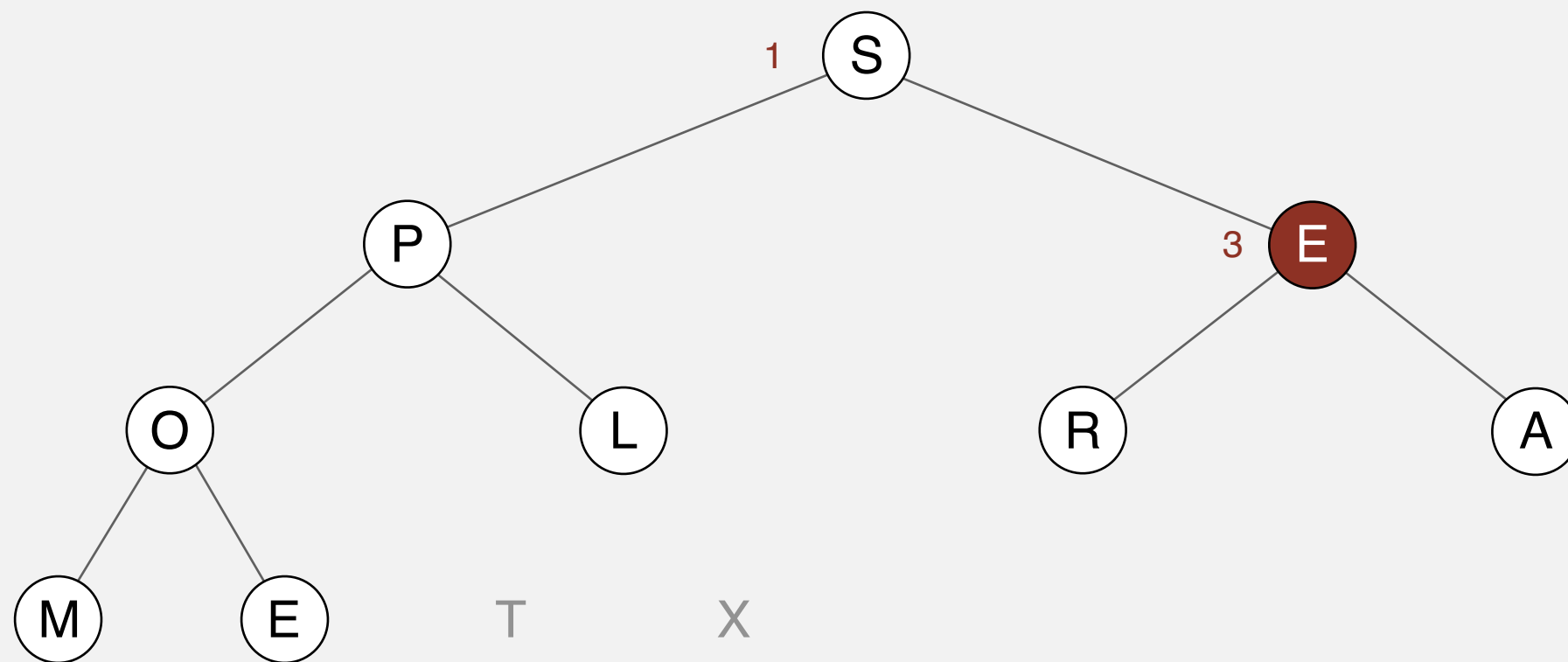
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

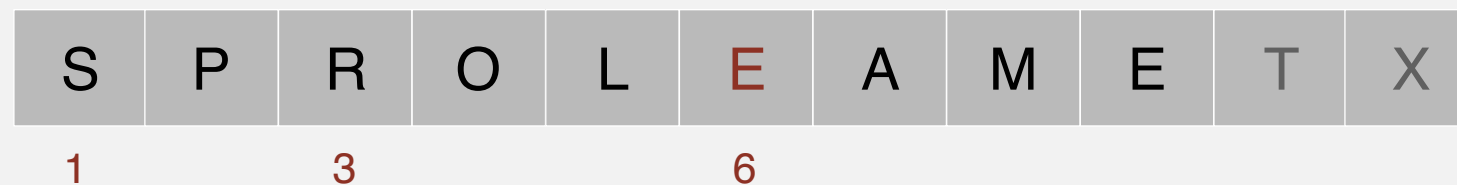
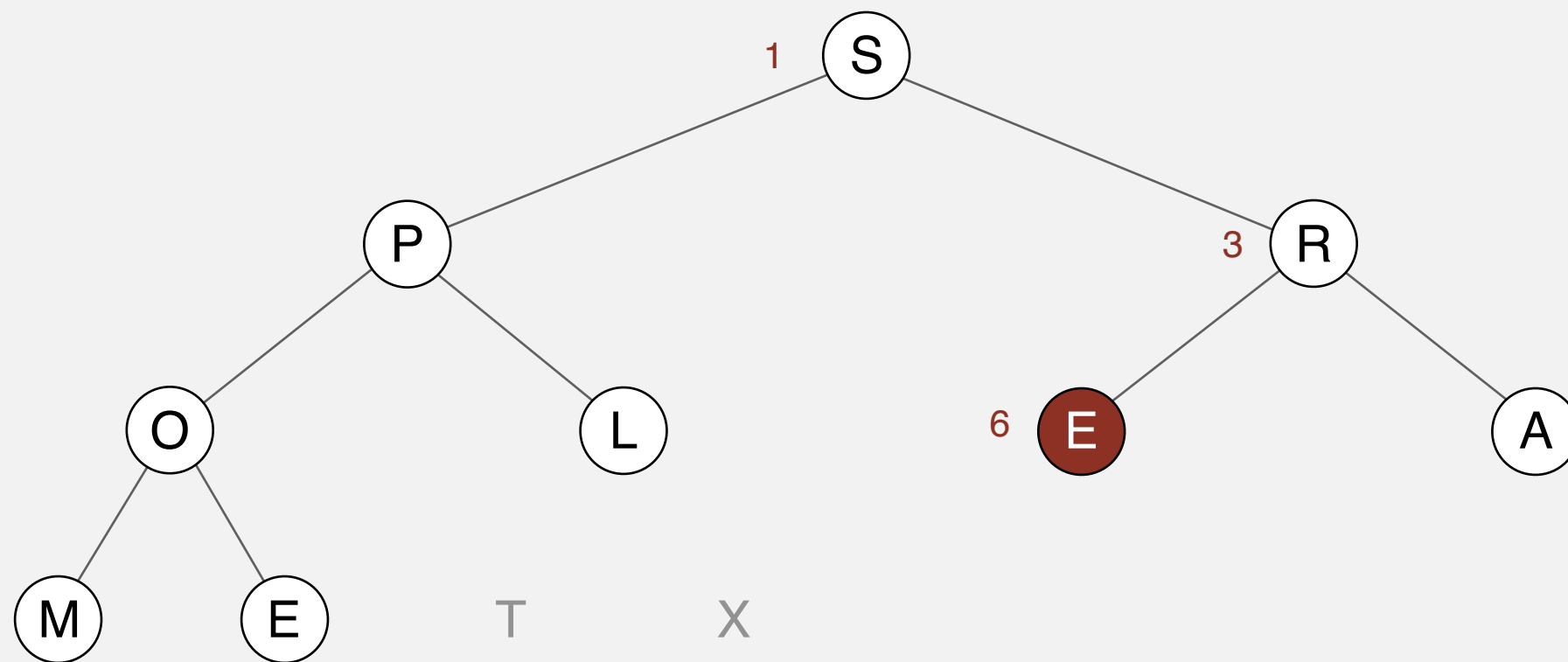
sink 1



Heapsort demo

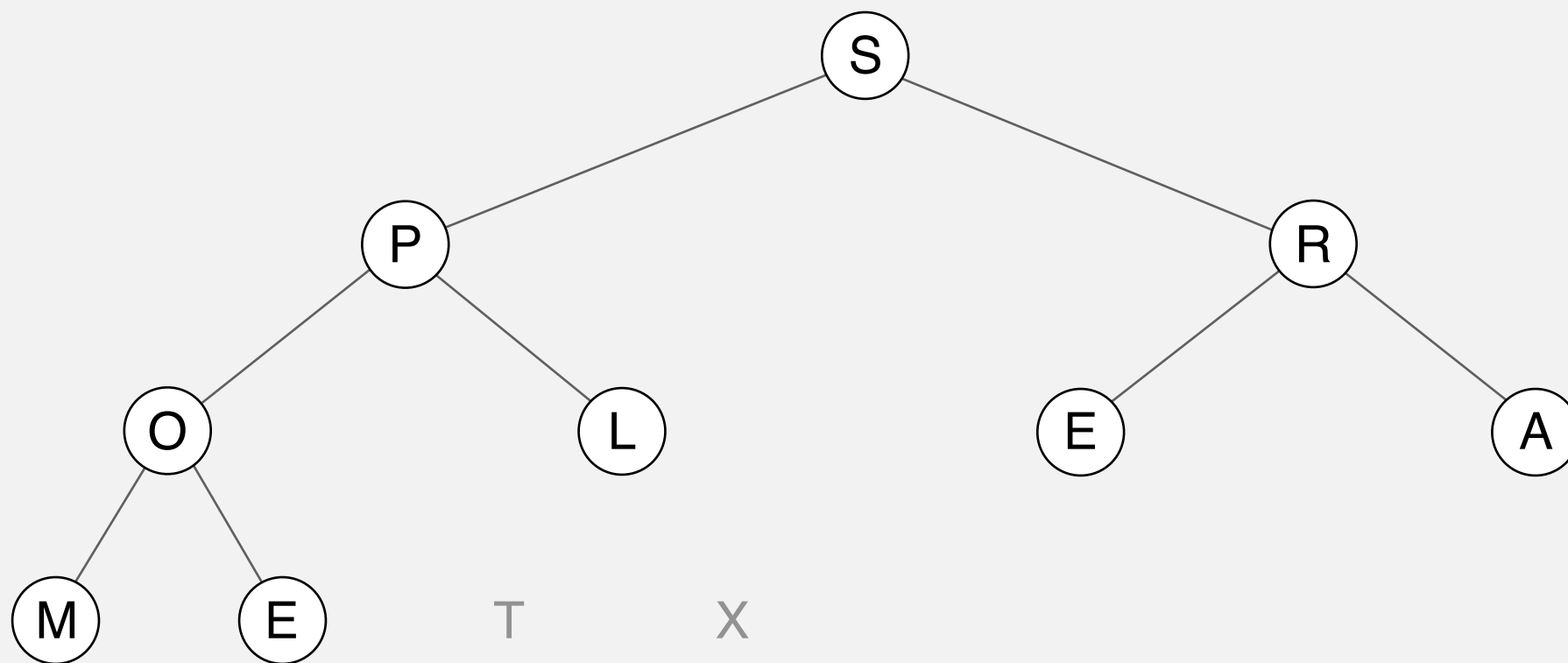
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.



S	P	R	O	L	E	A	M	E	T	X
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Sortdown. Repeatedly delete the largest remaining item.

exchange 1 and 9



Sortdown. Repeatedly delete the largest remaining item.

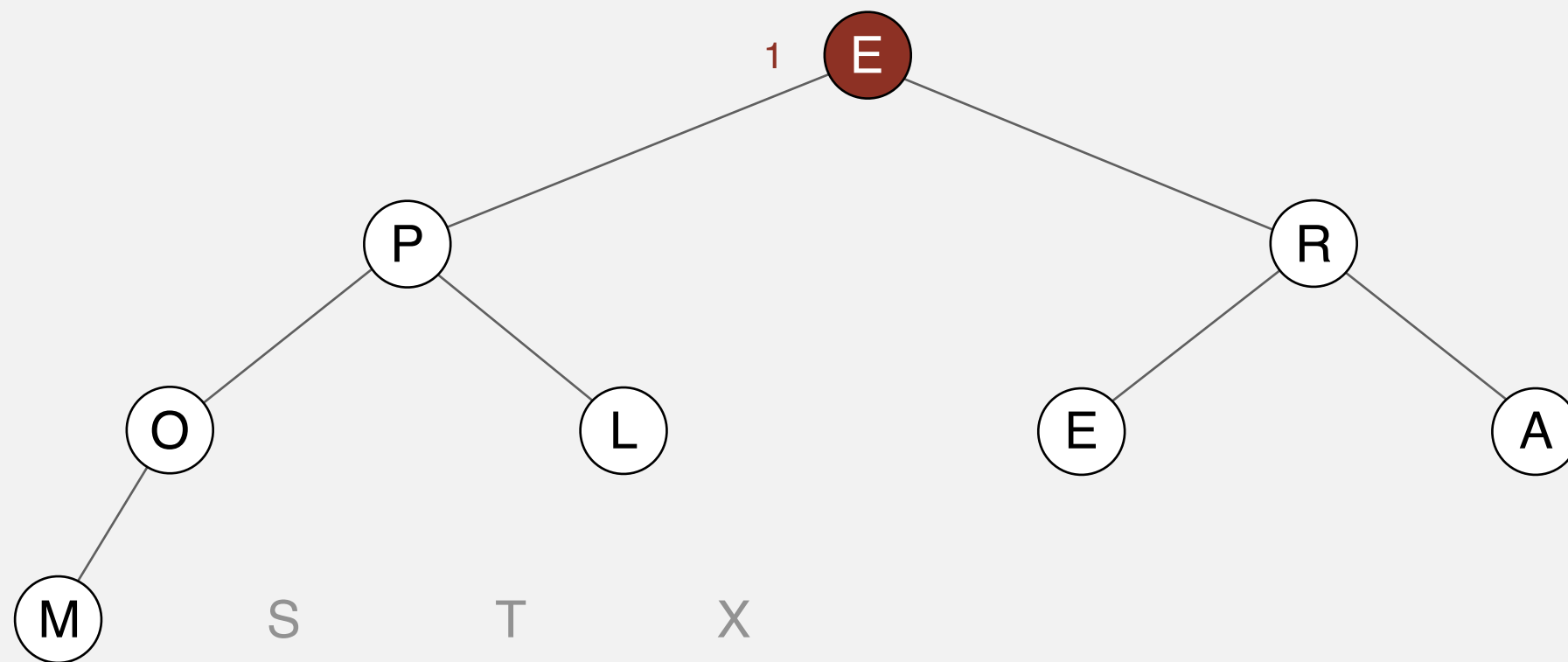
exchange 1 and 9



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

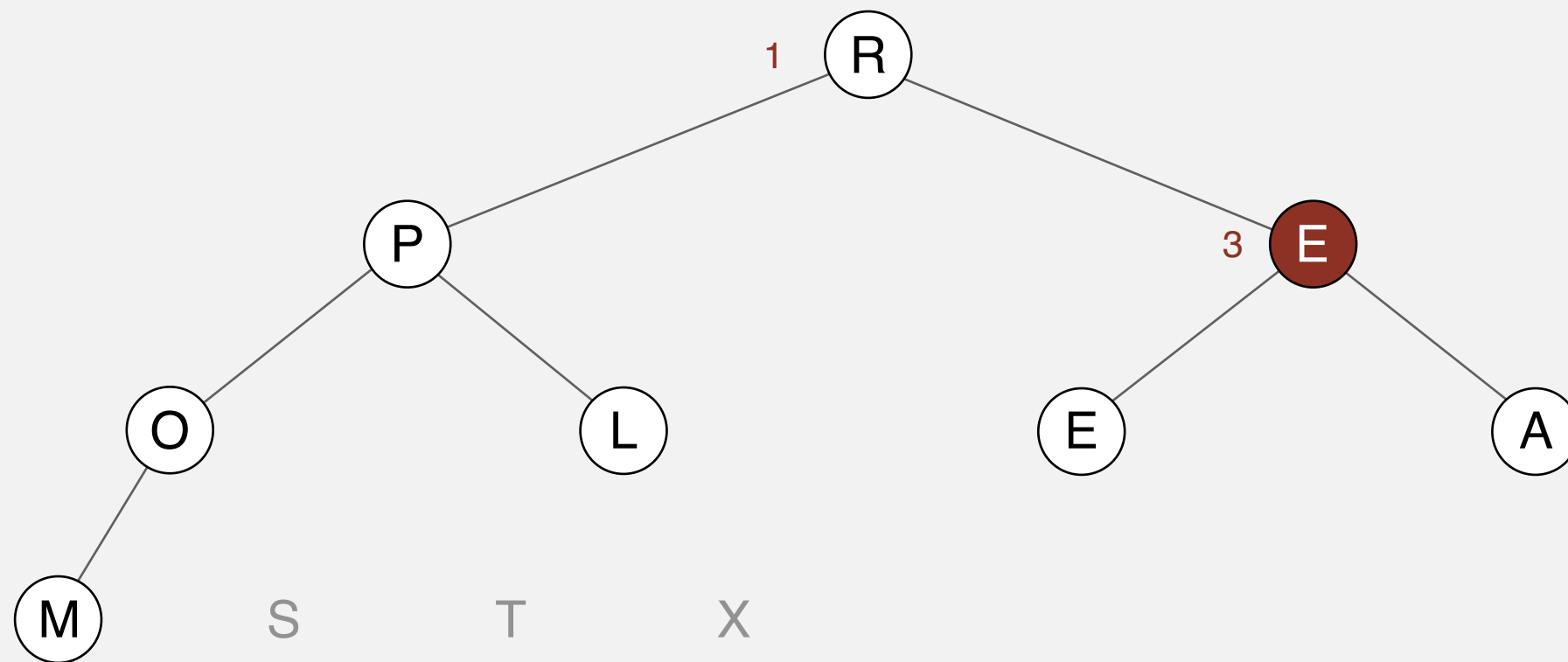
sink 1



Heapsort demo

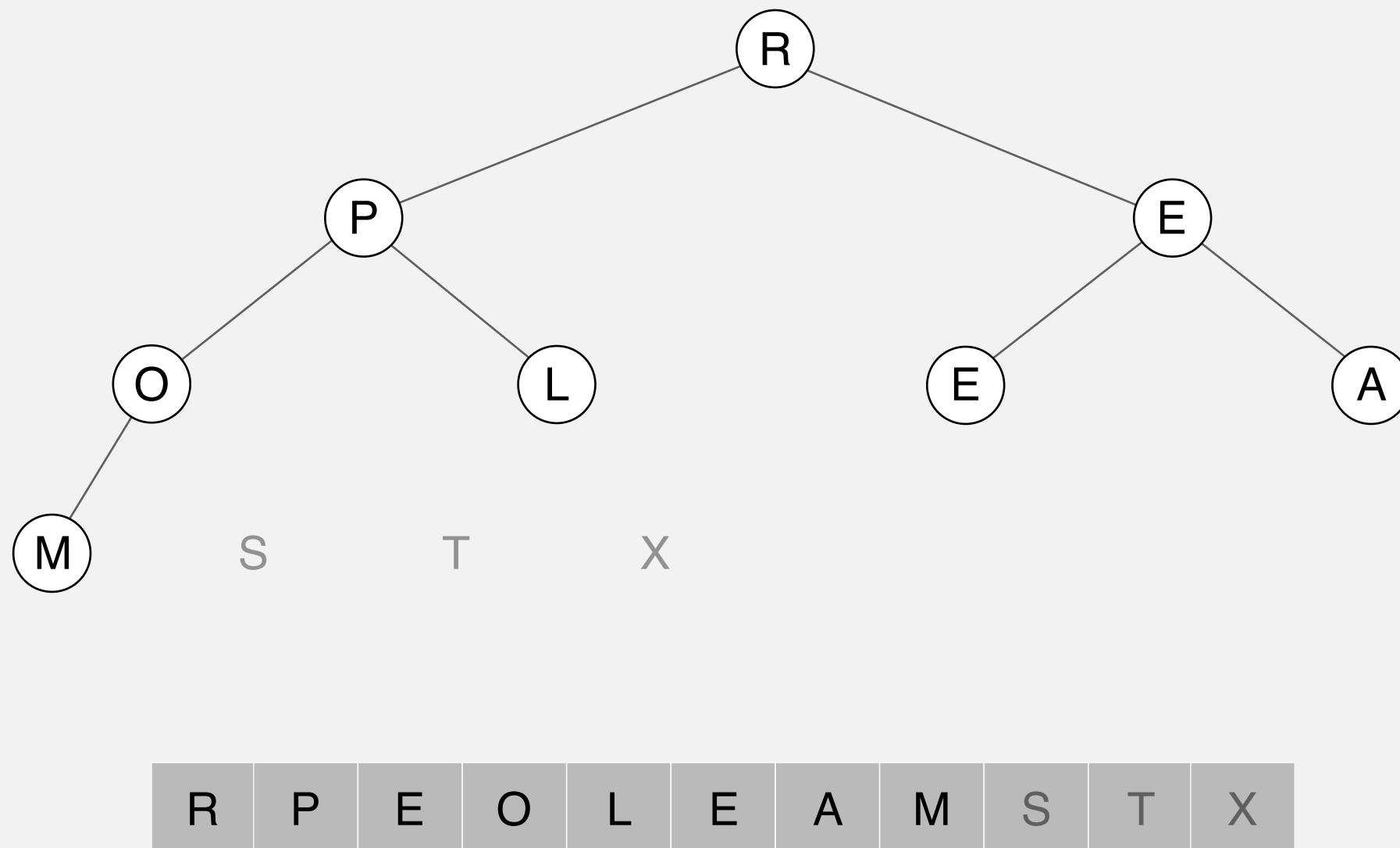
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

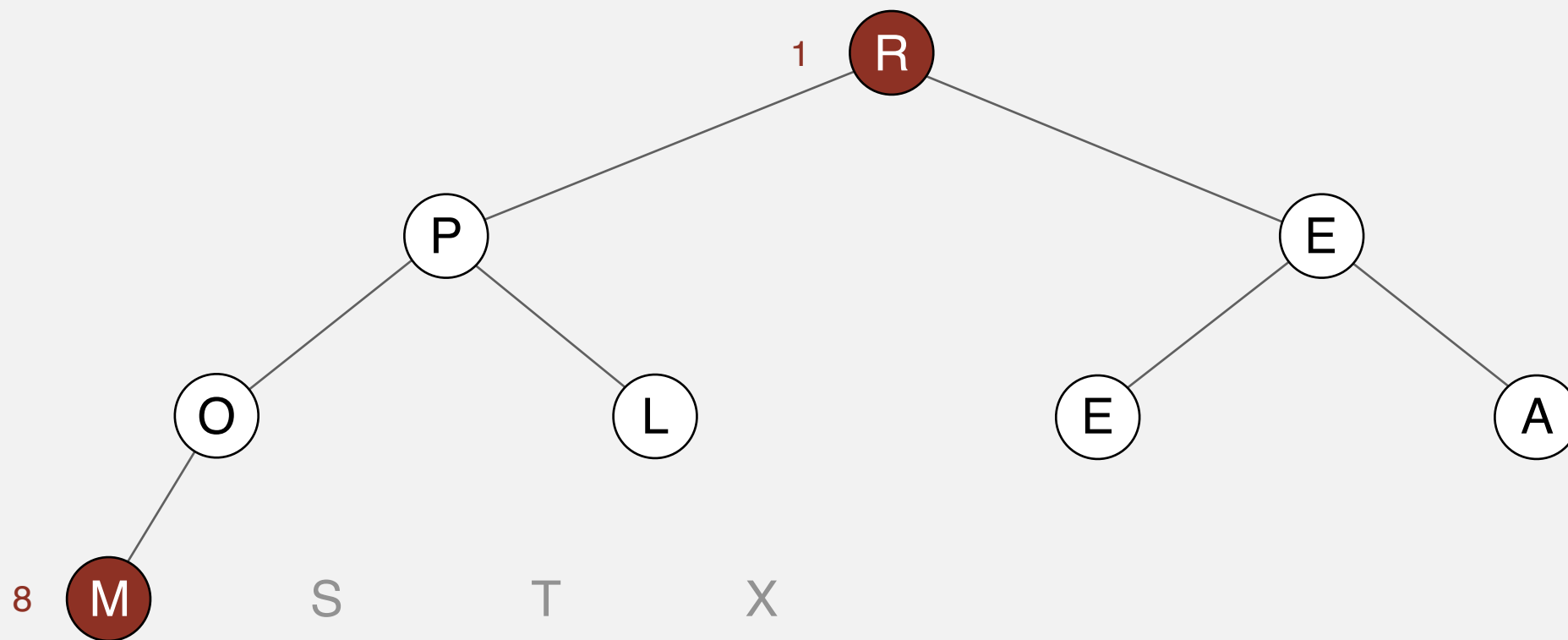
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

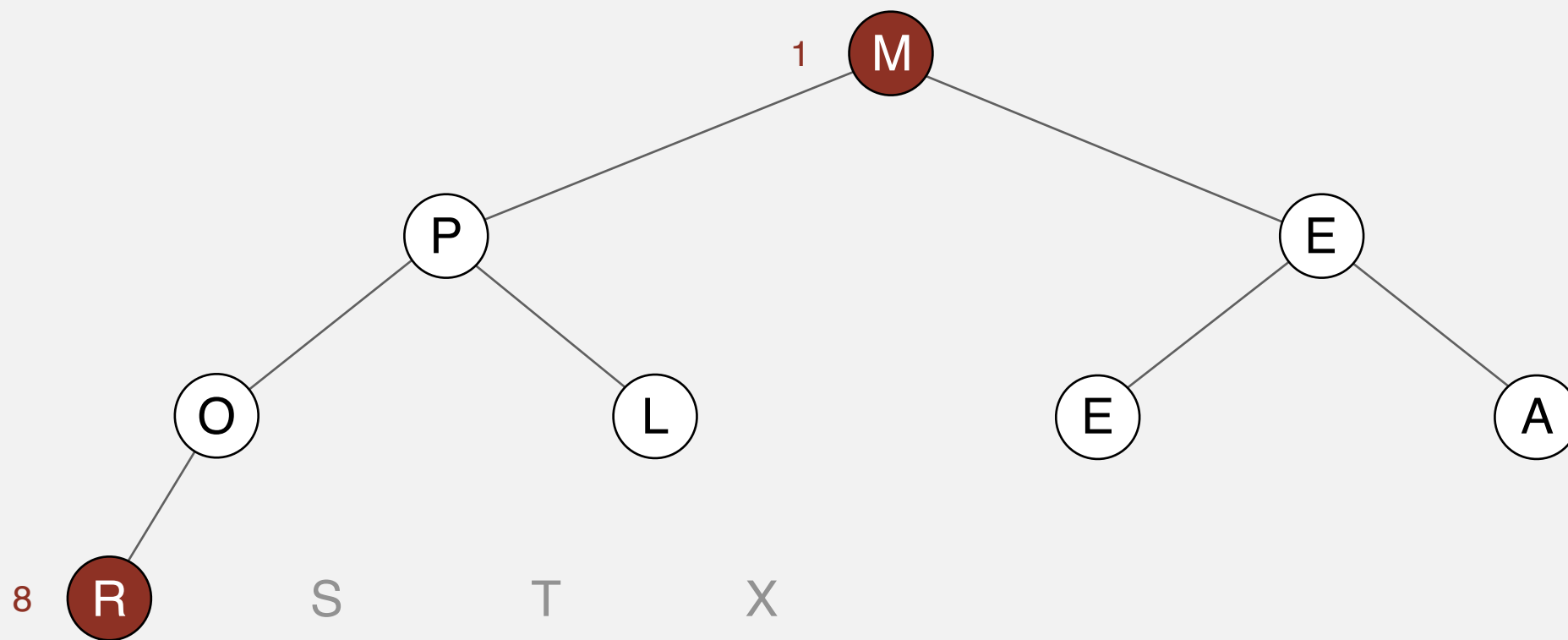
exchange 1 and 8



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

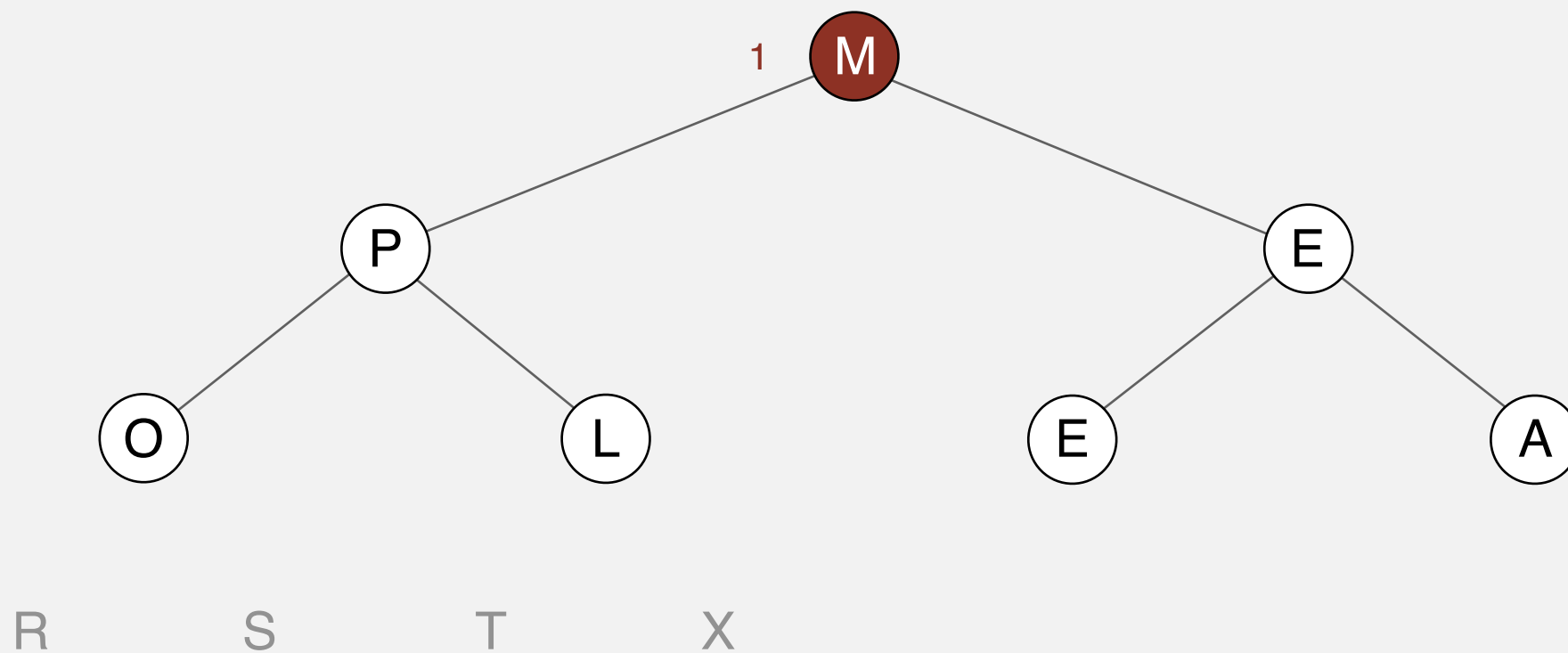
exchange 1 and 8



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

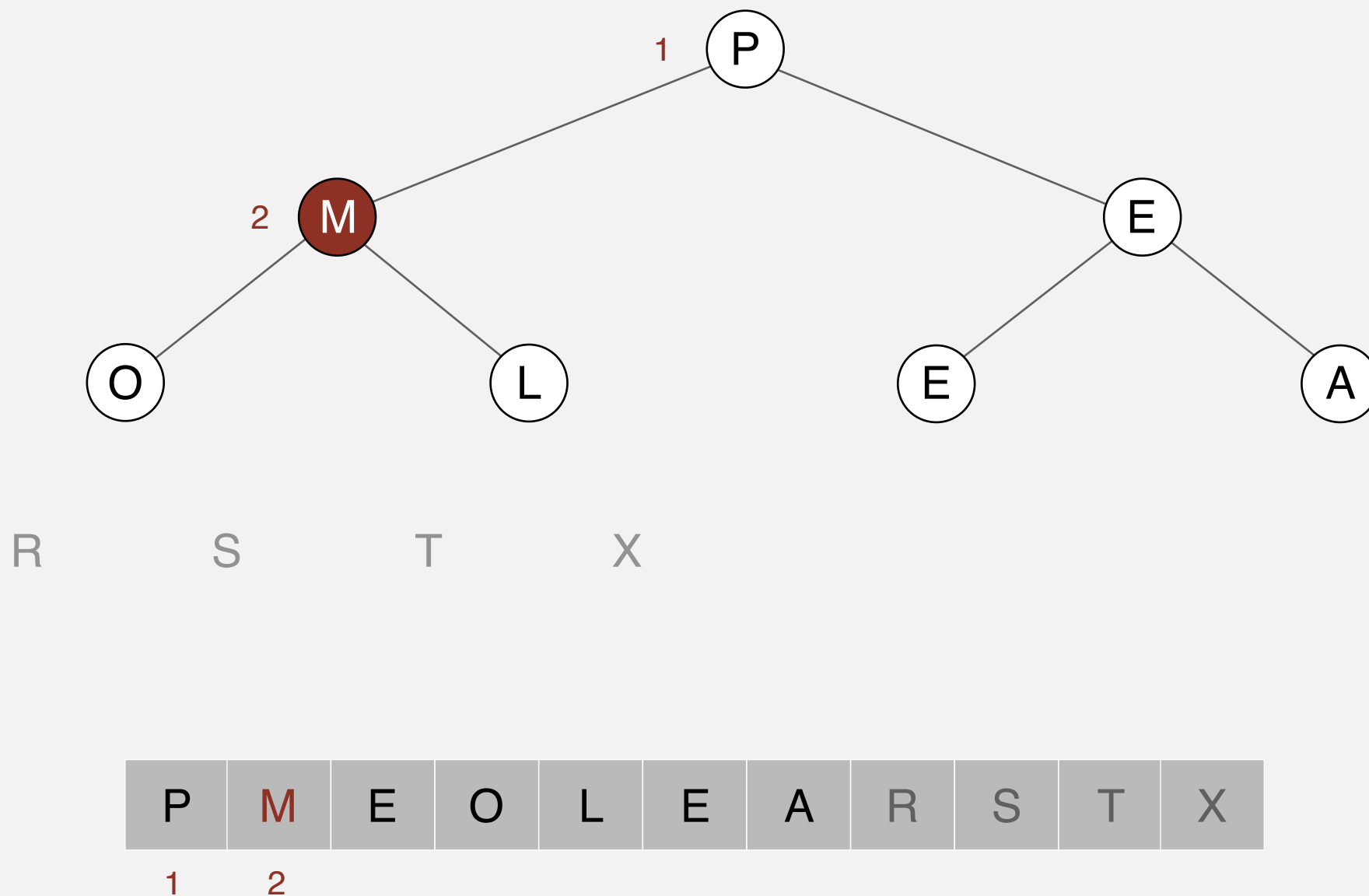
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

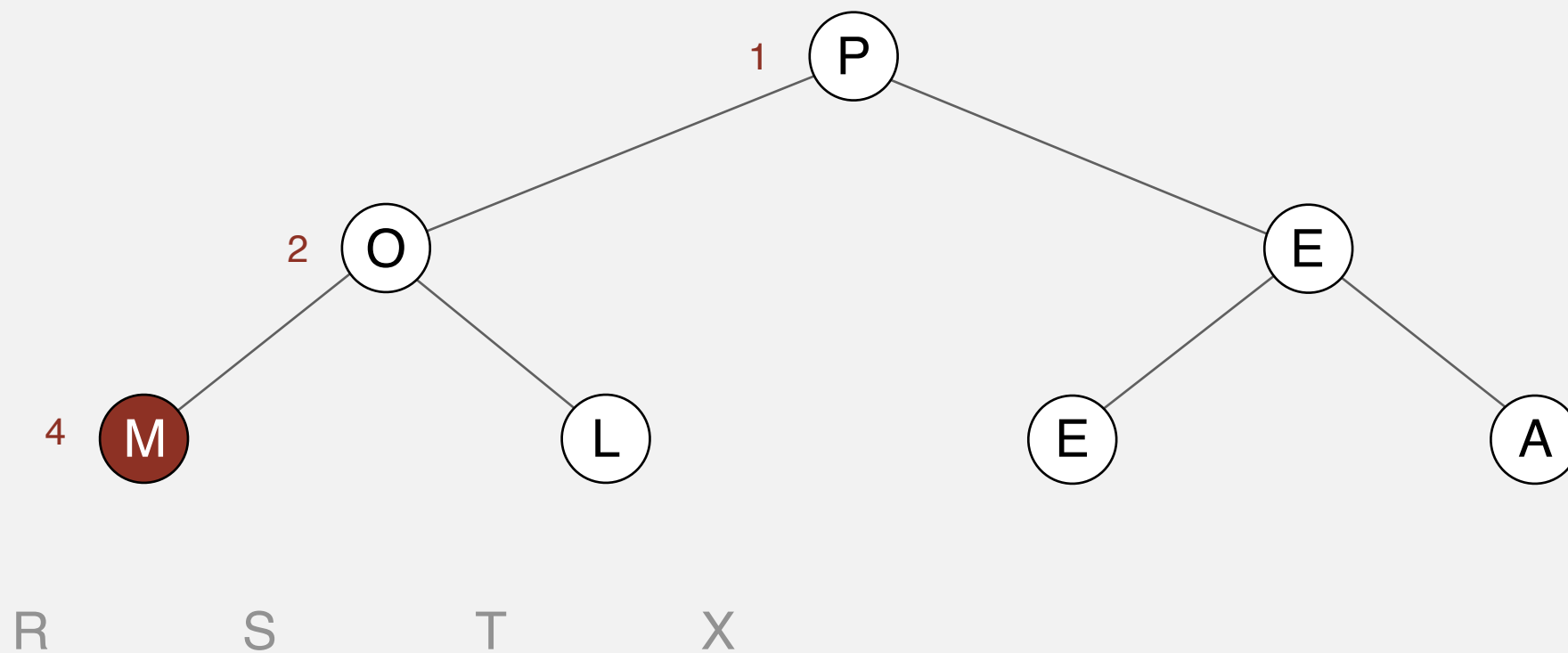
sink 1



Heapsort demo

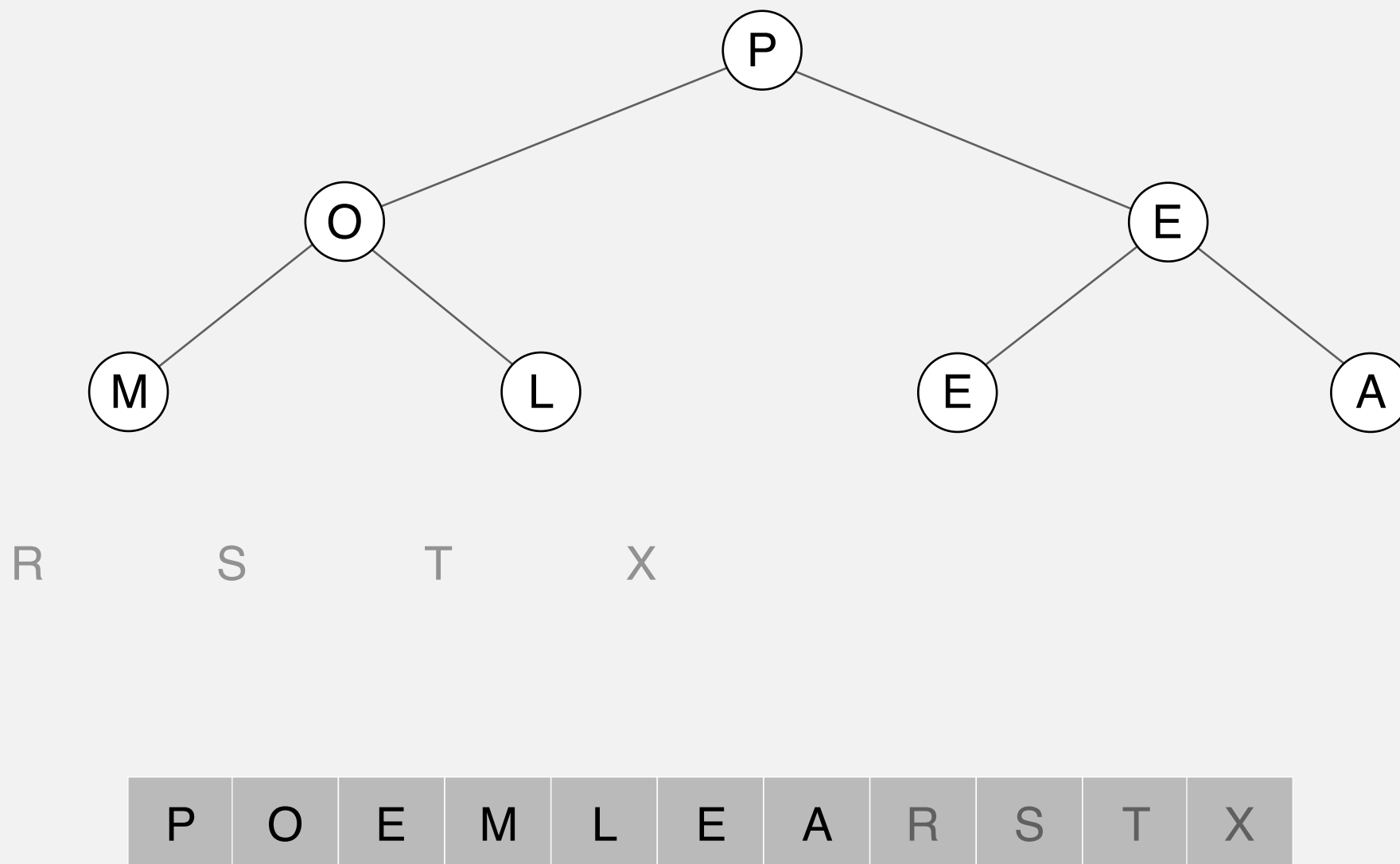
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

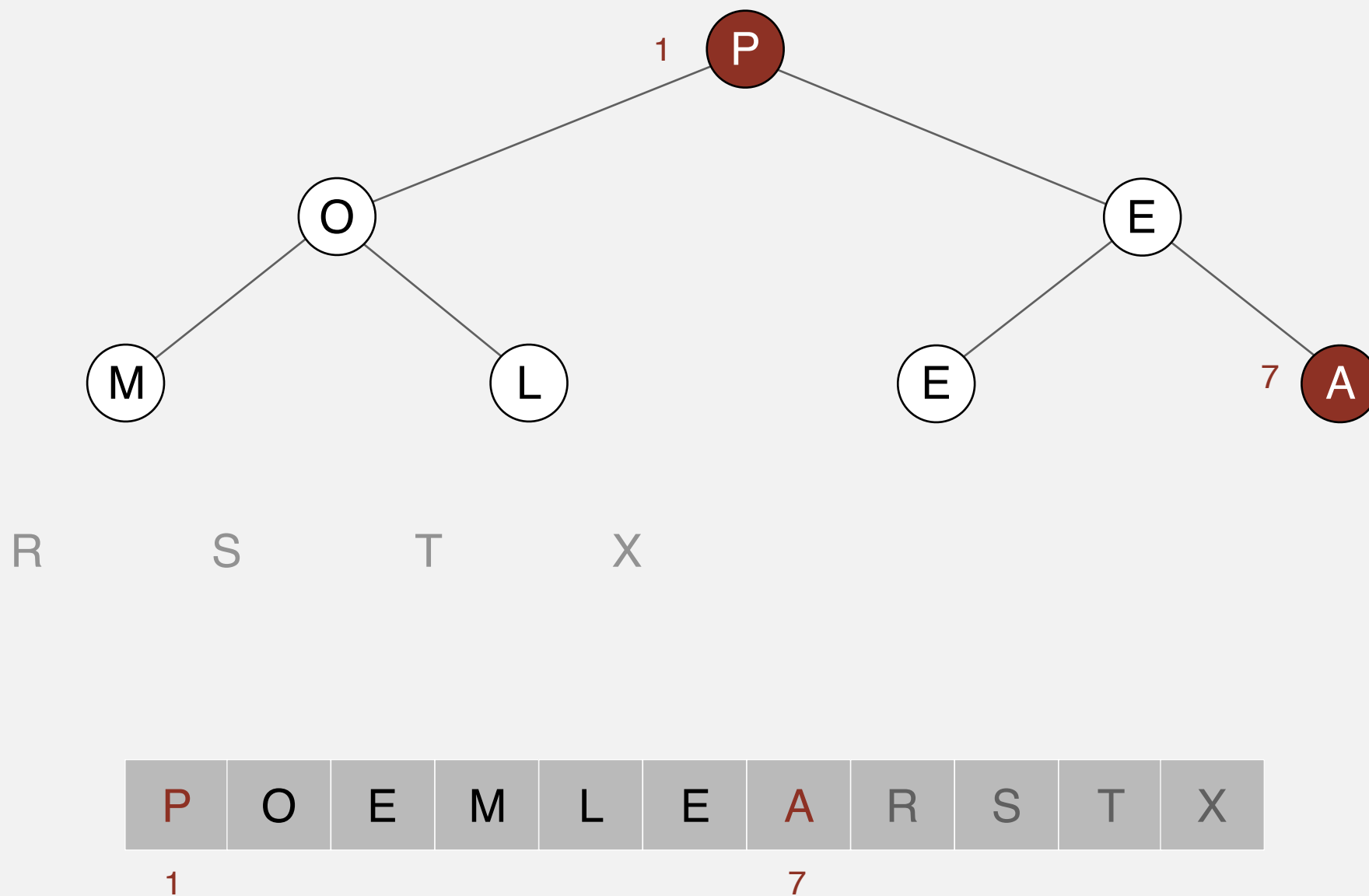
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

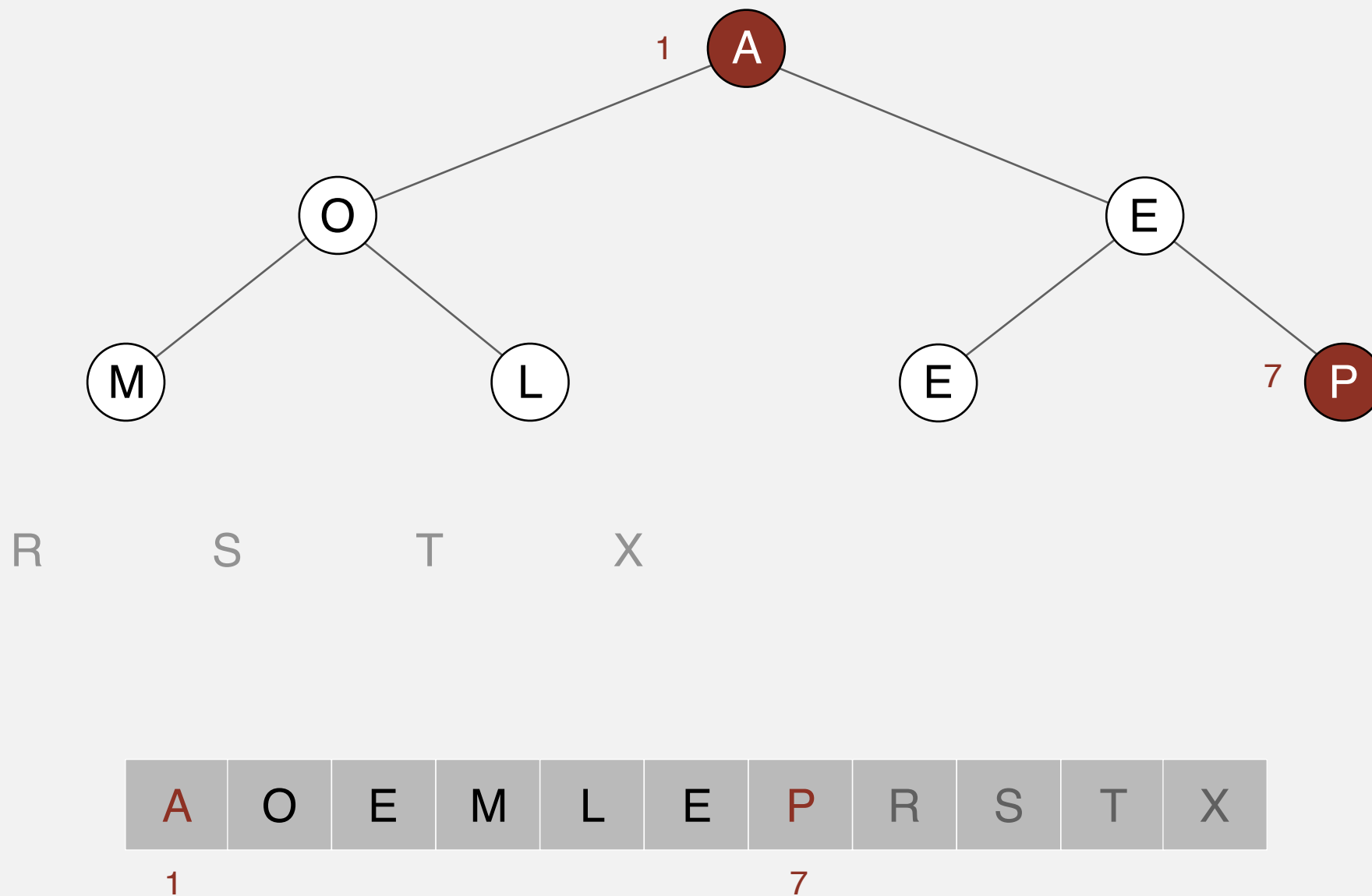
exchange 1 and 7



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

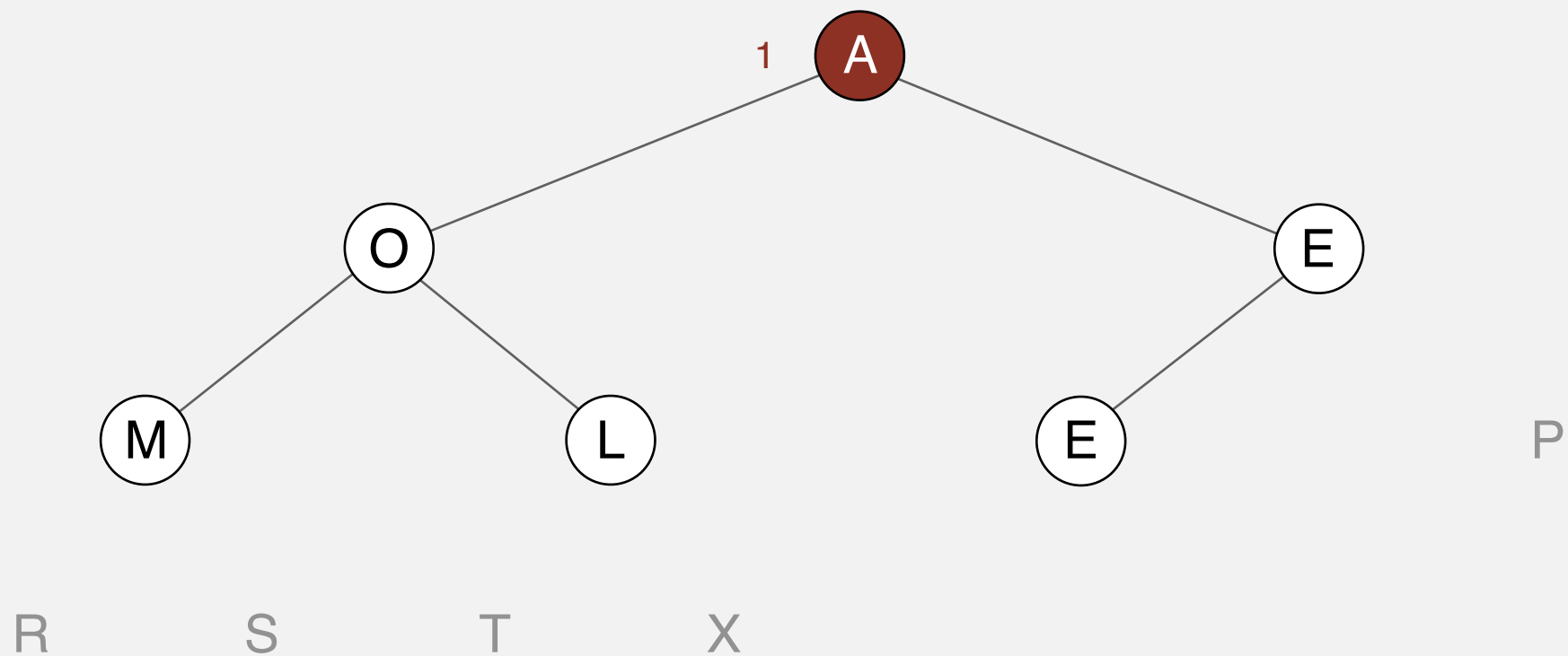
exchange 1 and 7



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

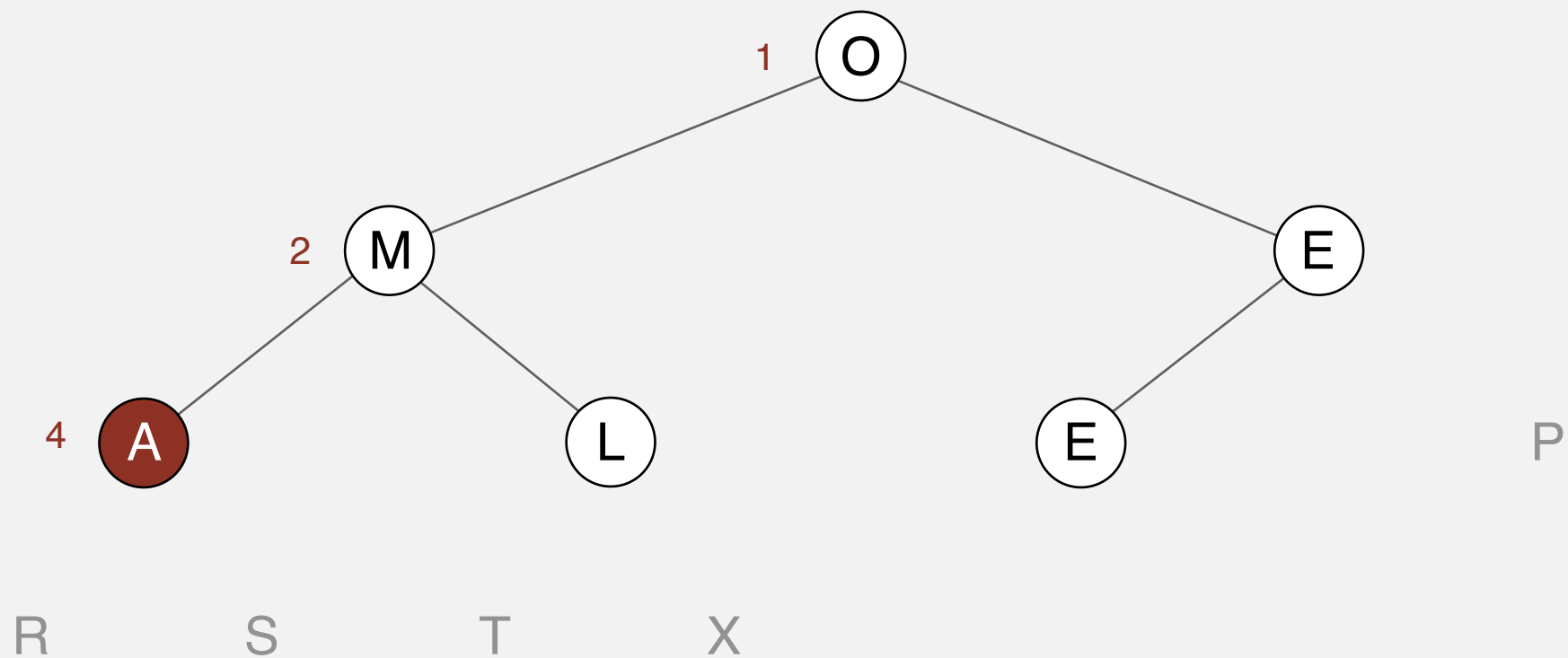
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

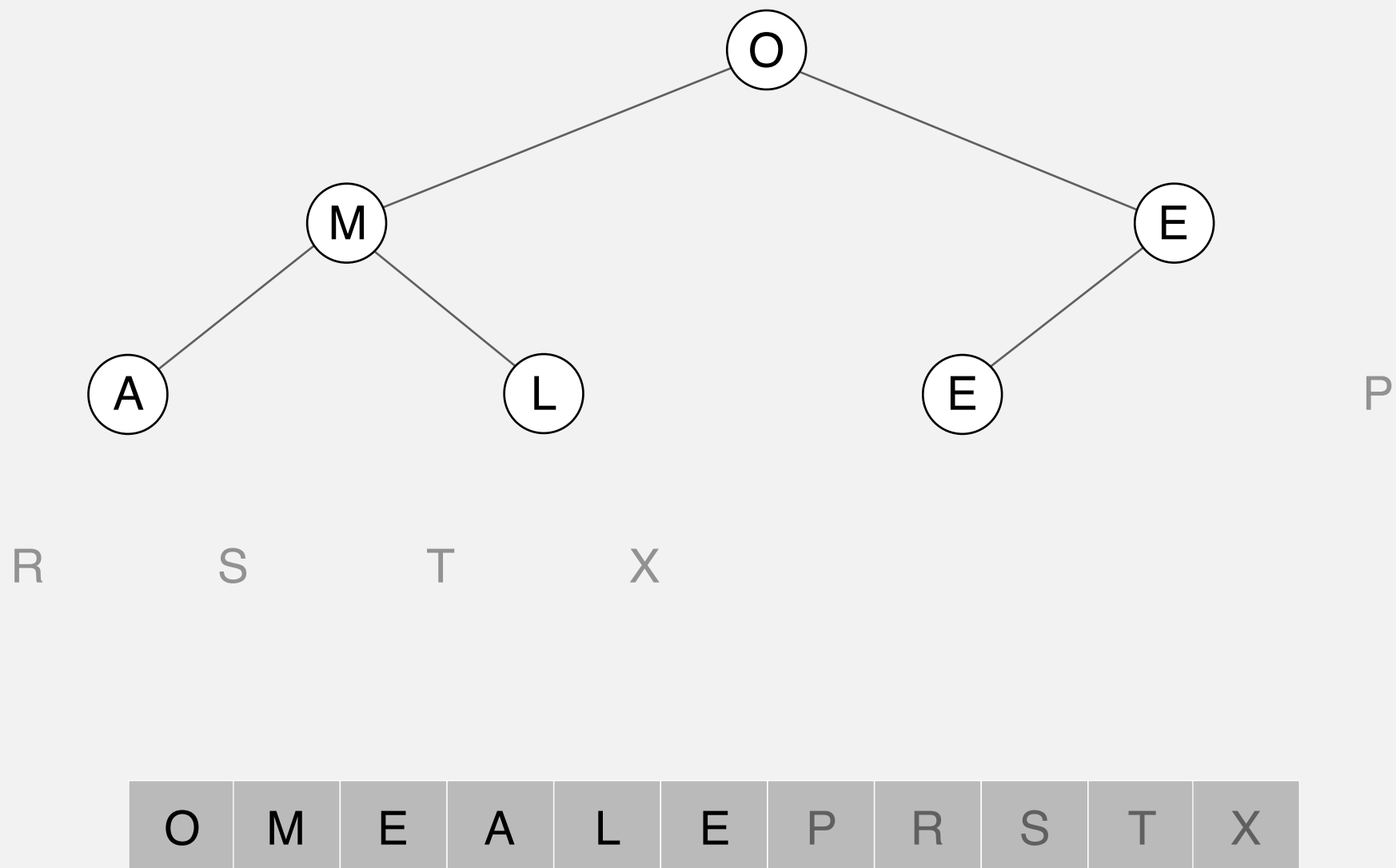
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

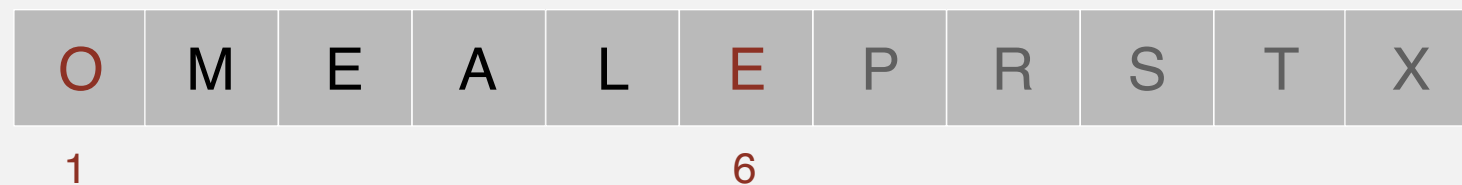
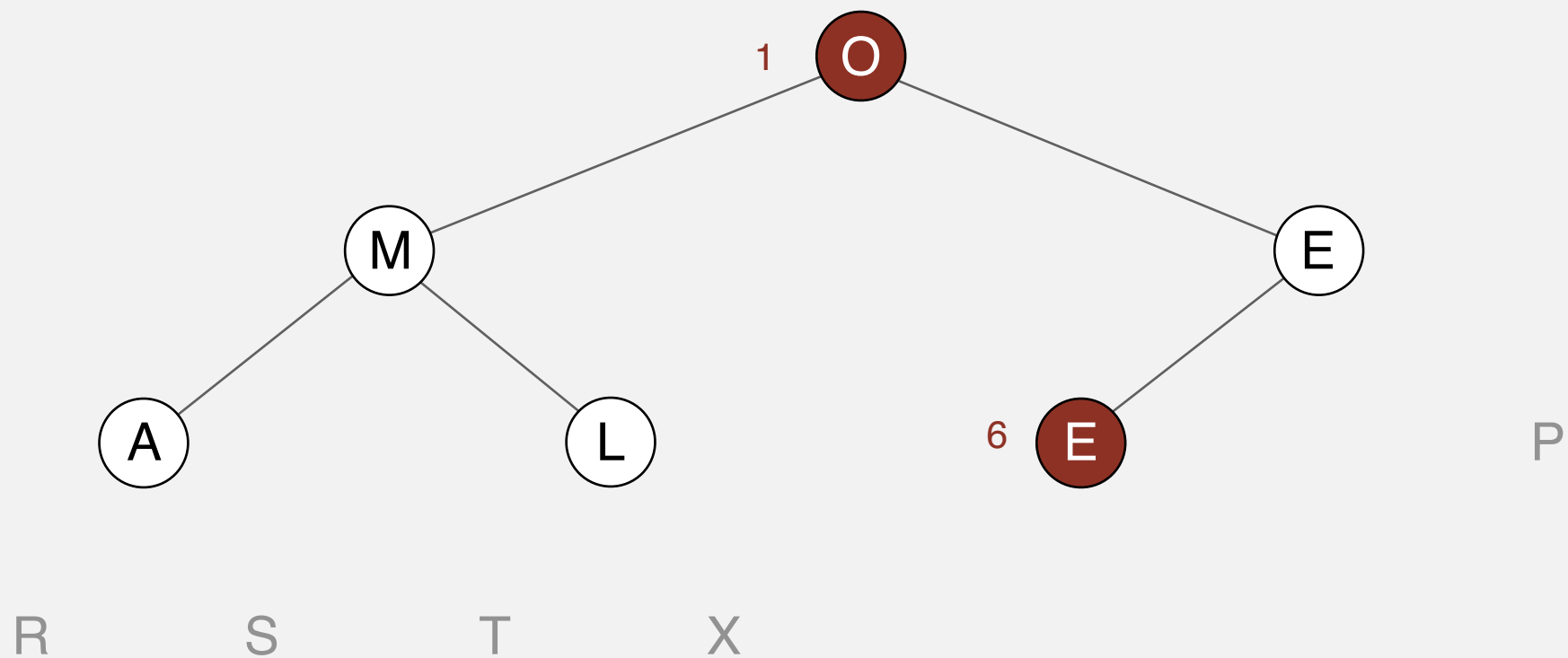
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

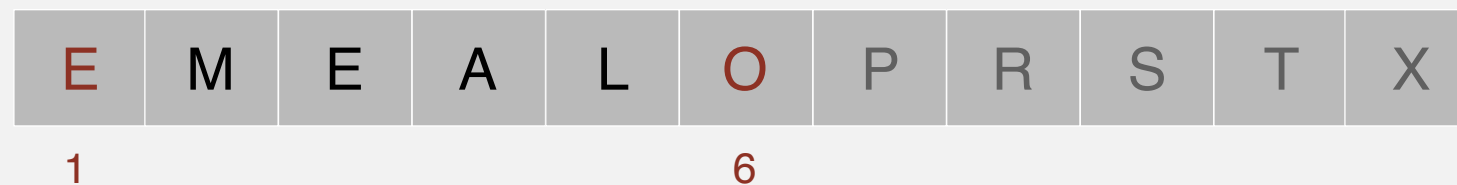
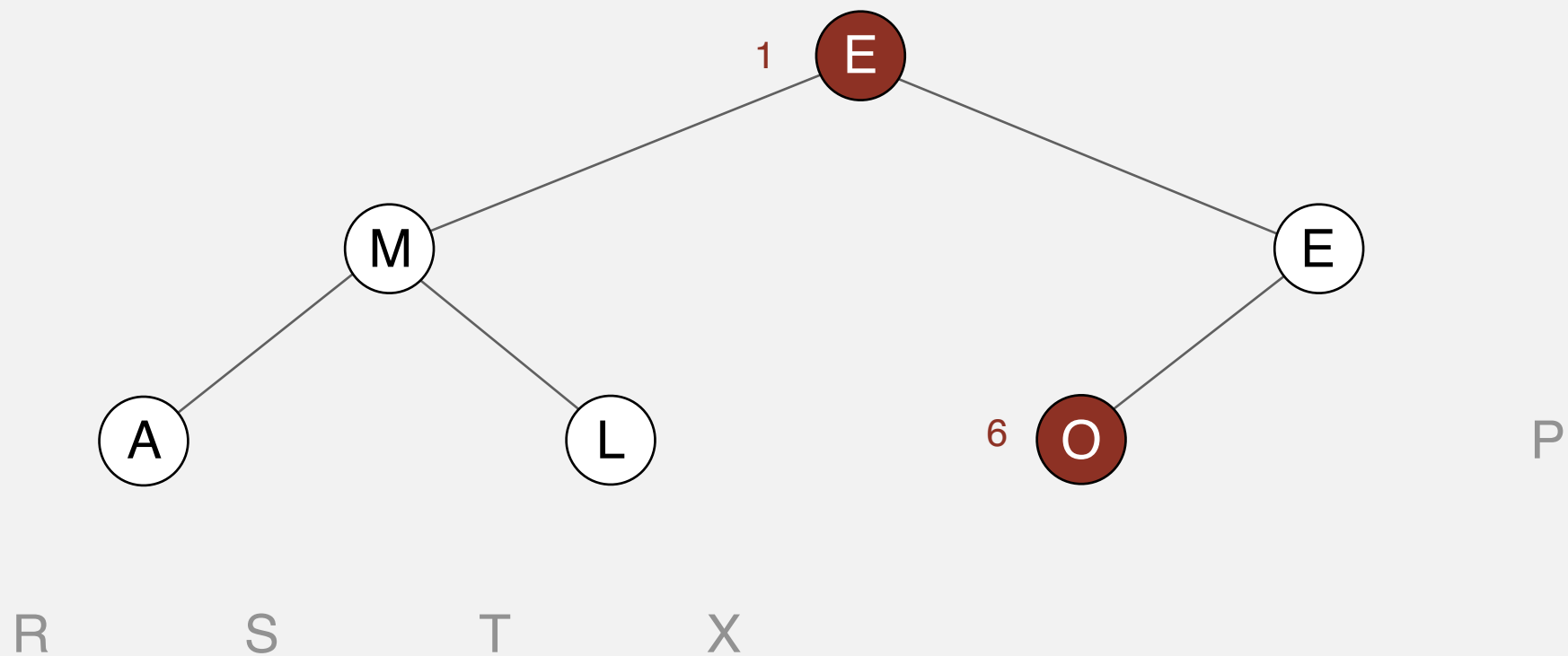
exchange 1 and 6



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

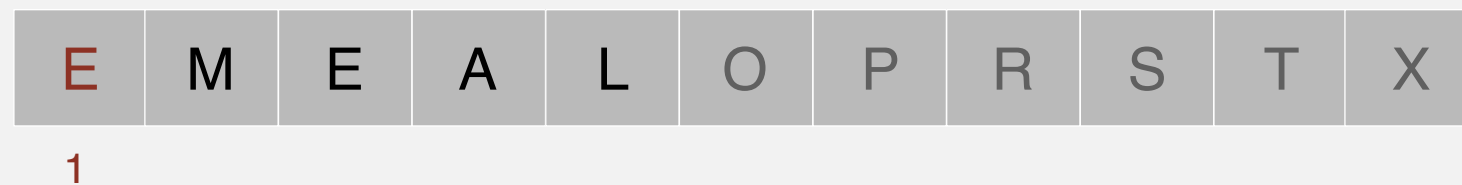
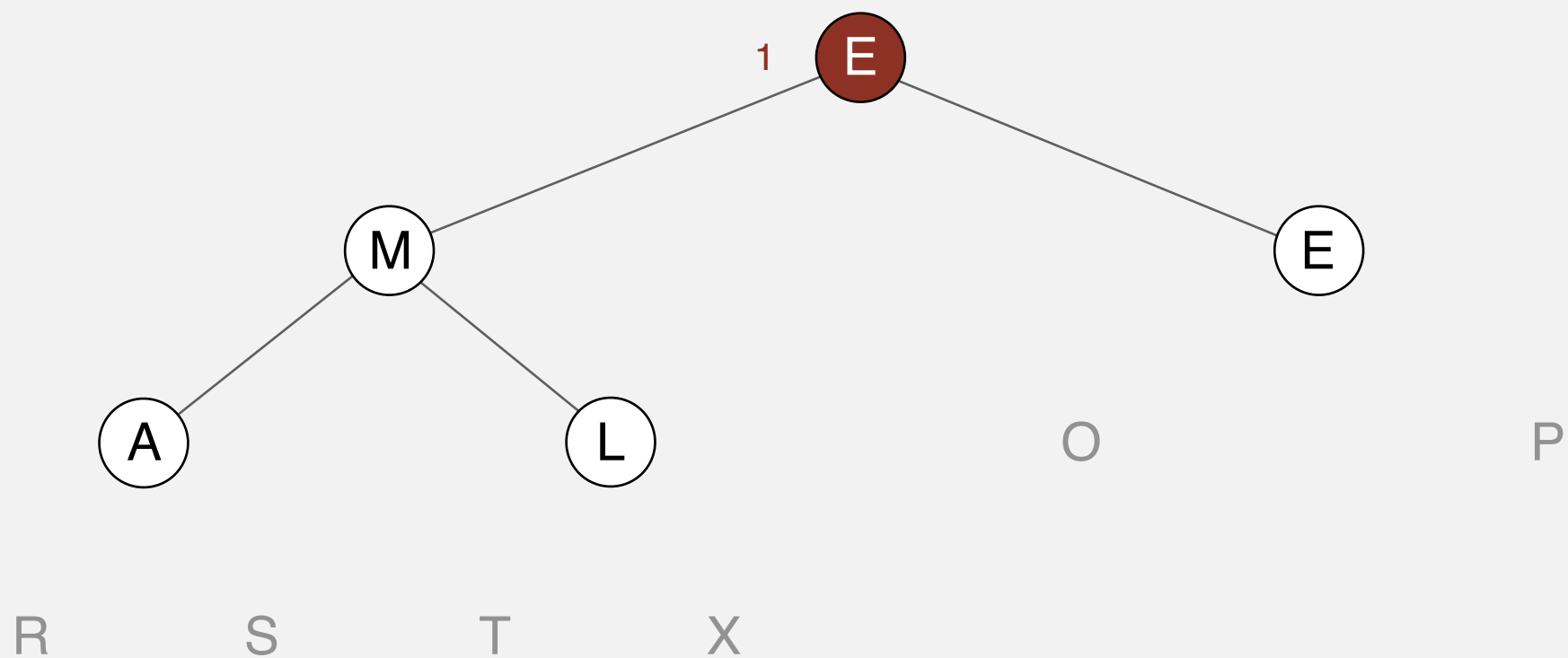
exchange 1 and 6



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

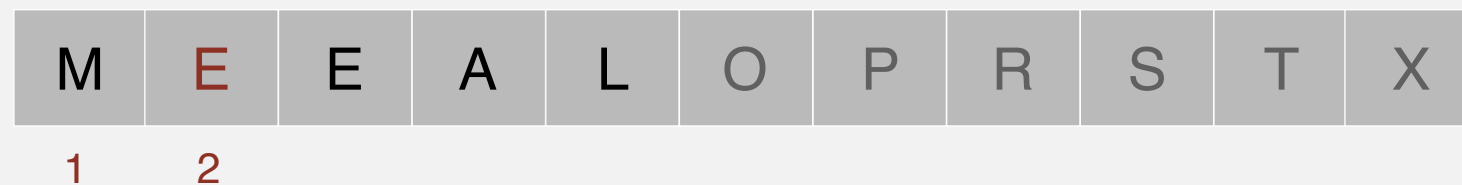
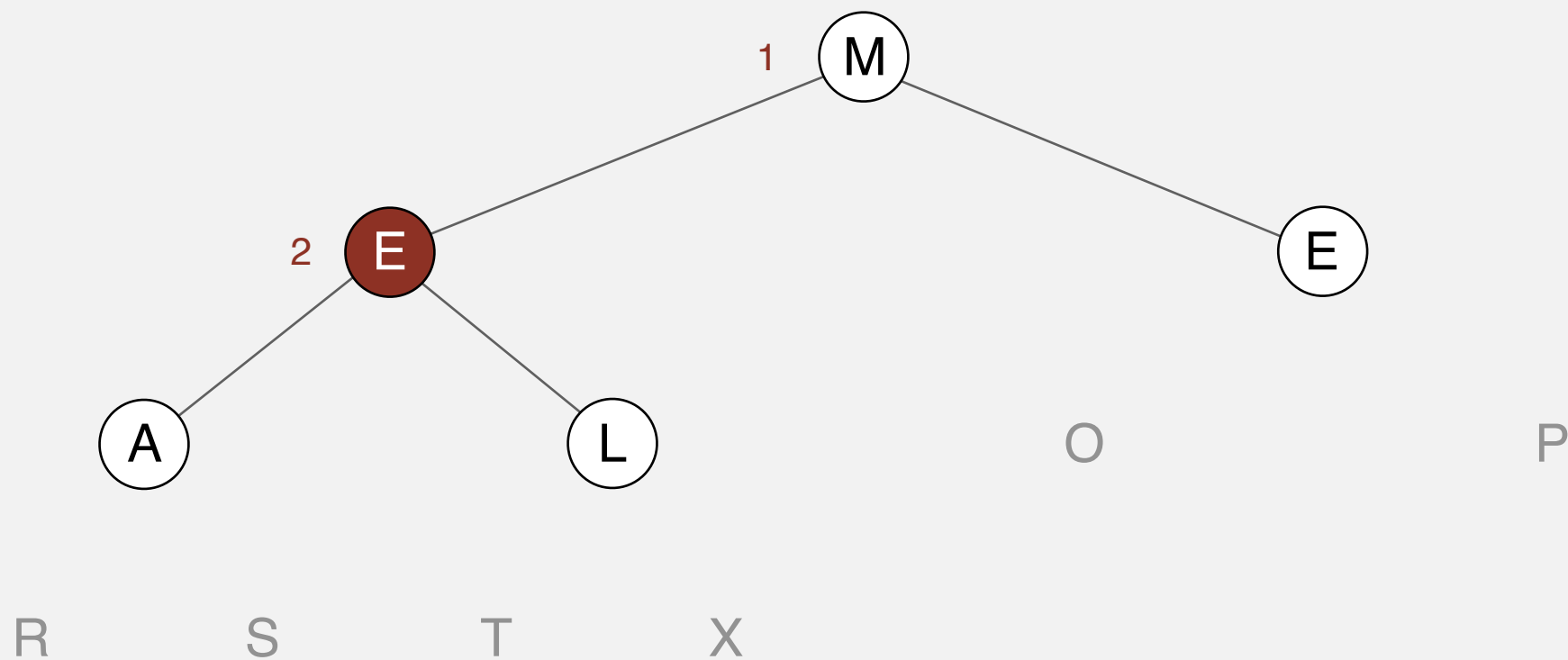
sink 1



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

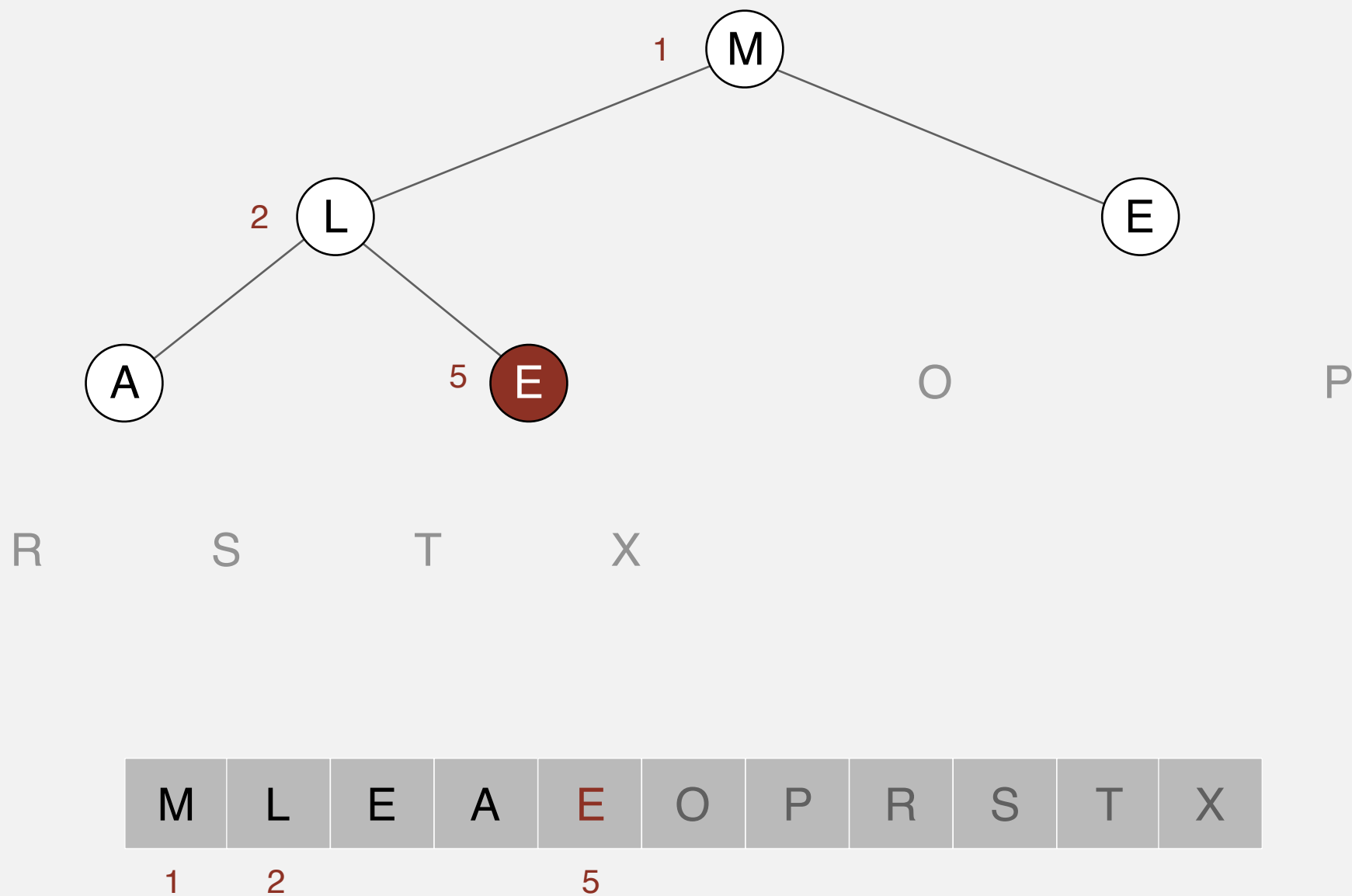
sink 1



Heapsort demo

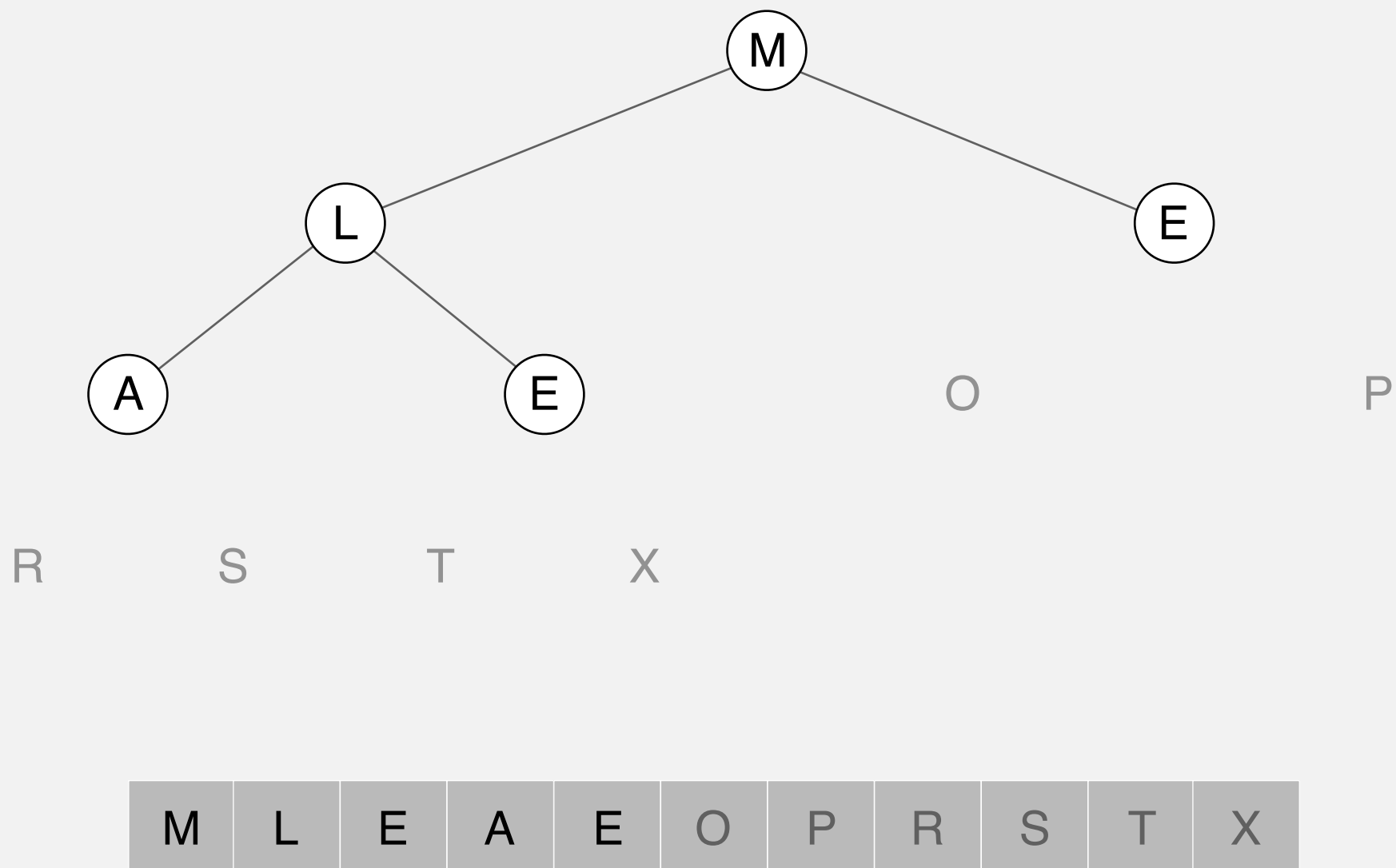
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

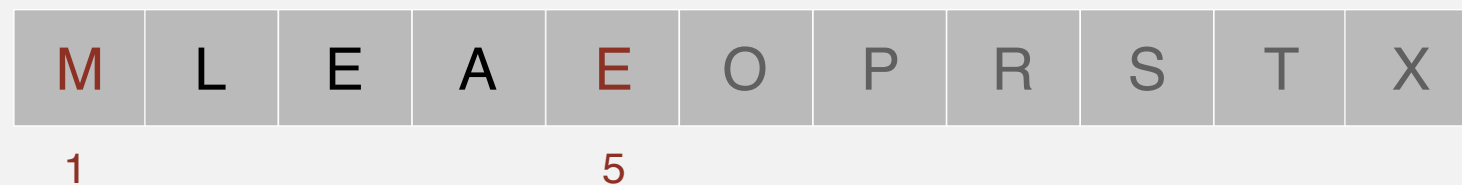
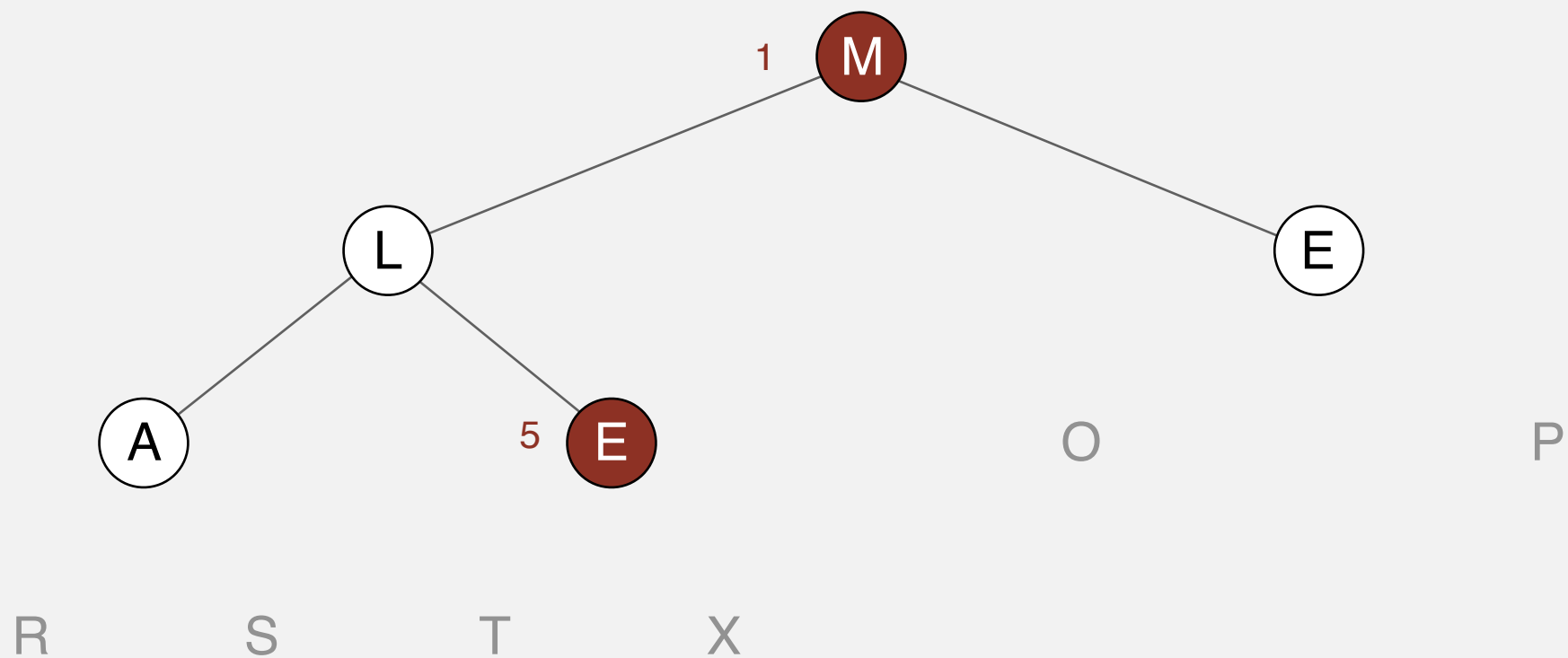
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

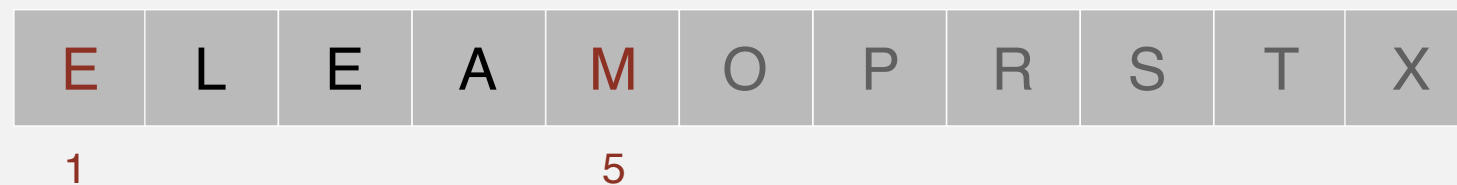
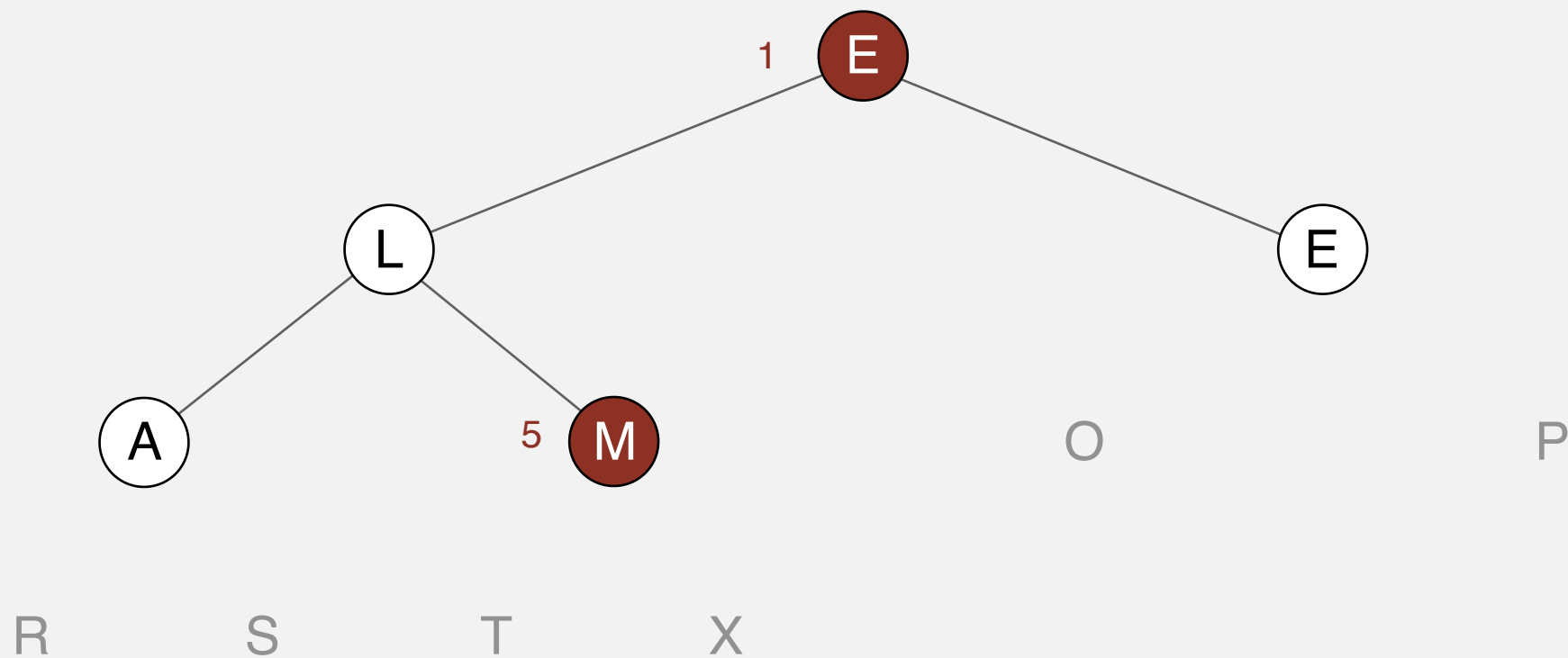
exchange 1 and 5



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

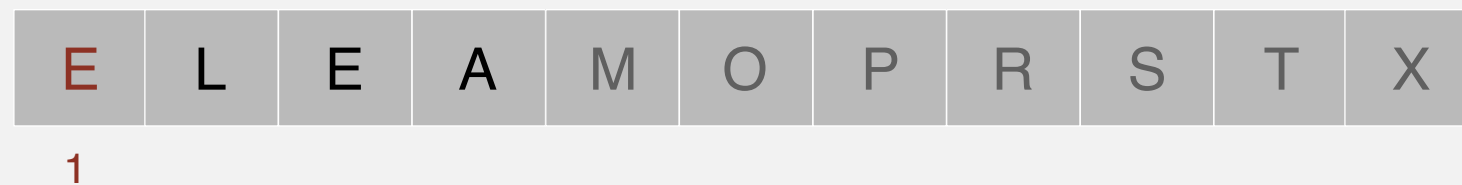
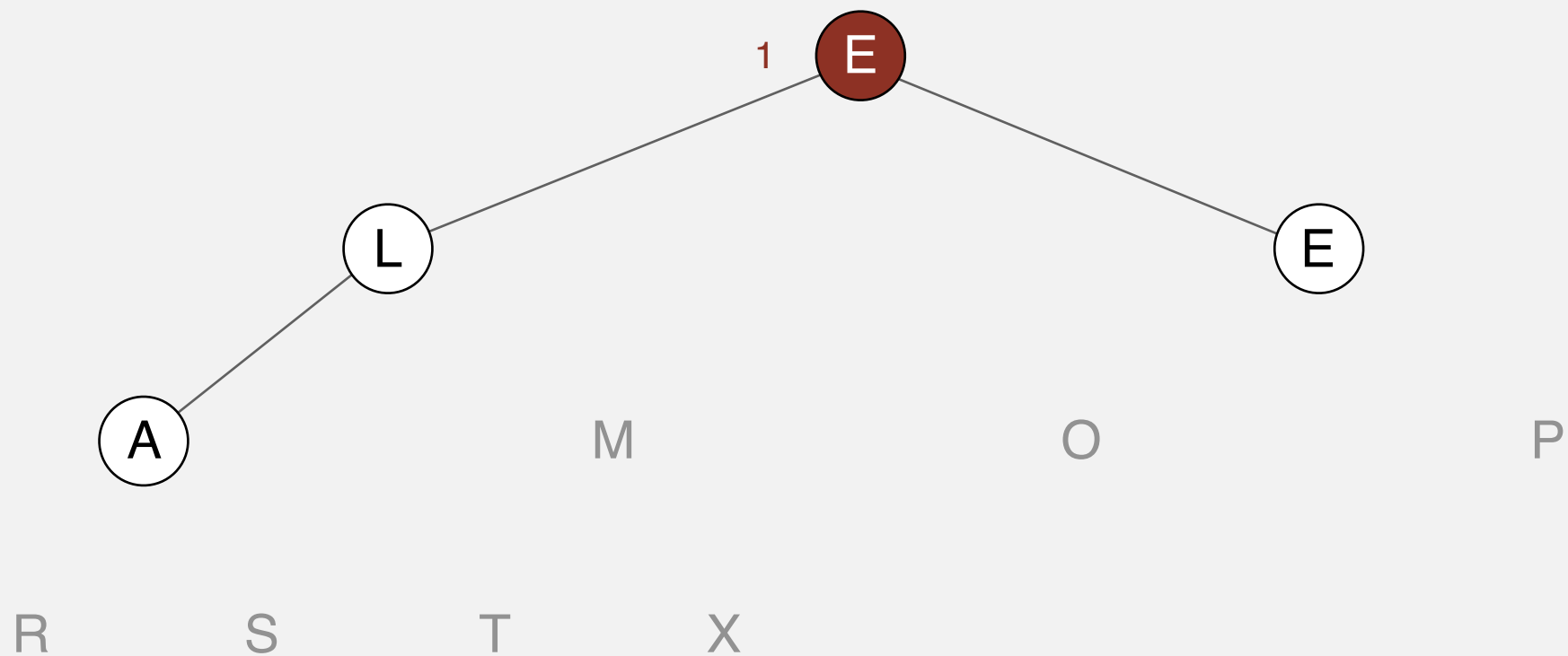
exchange 1 and 5



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

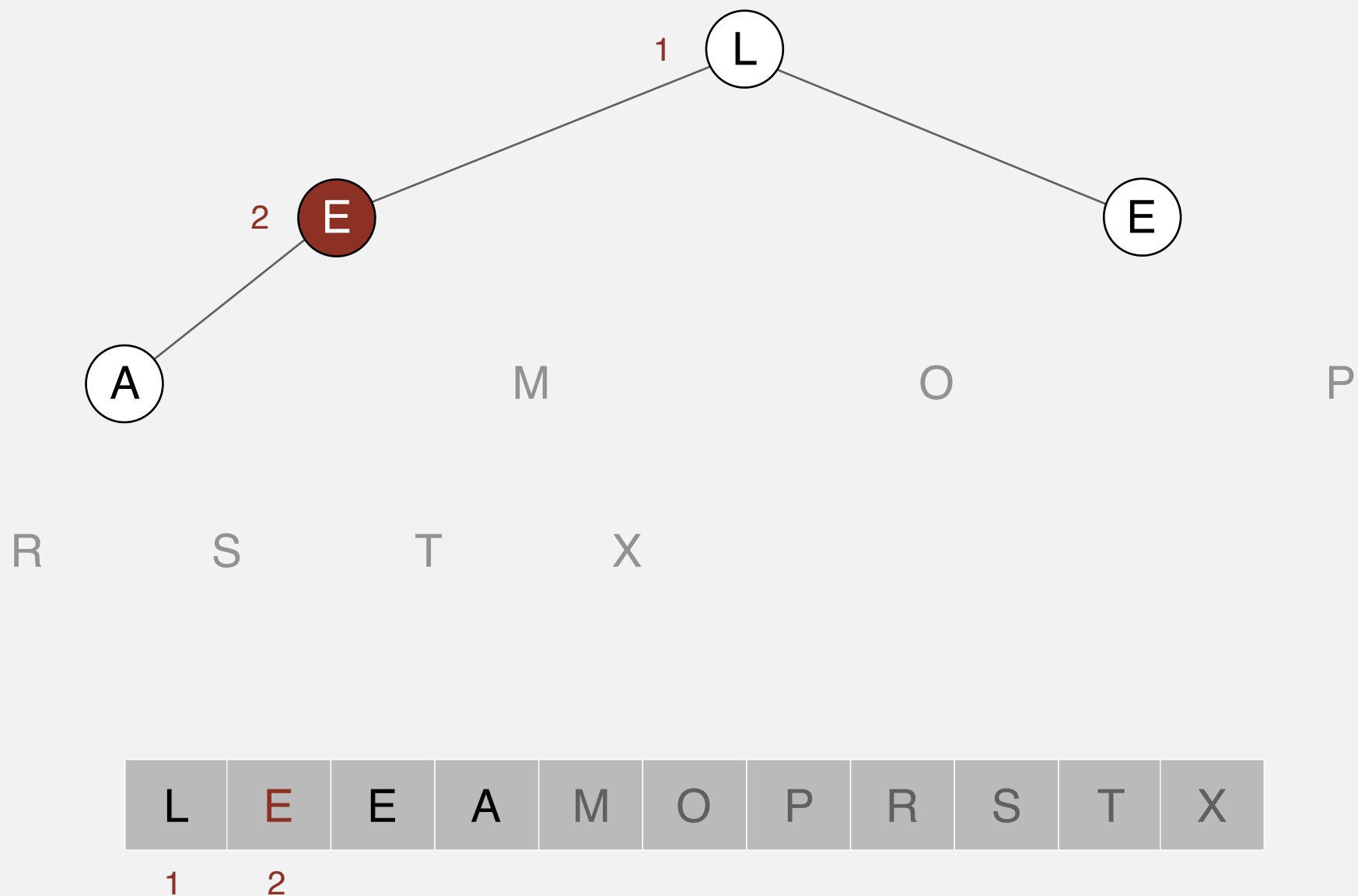
sink 1



Heapsort demo

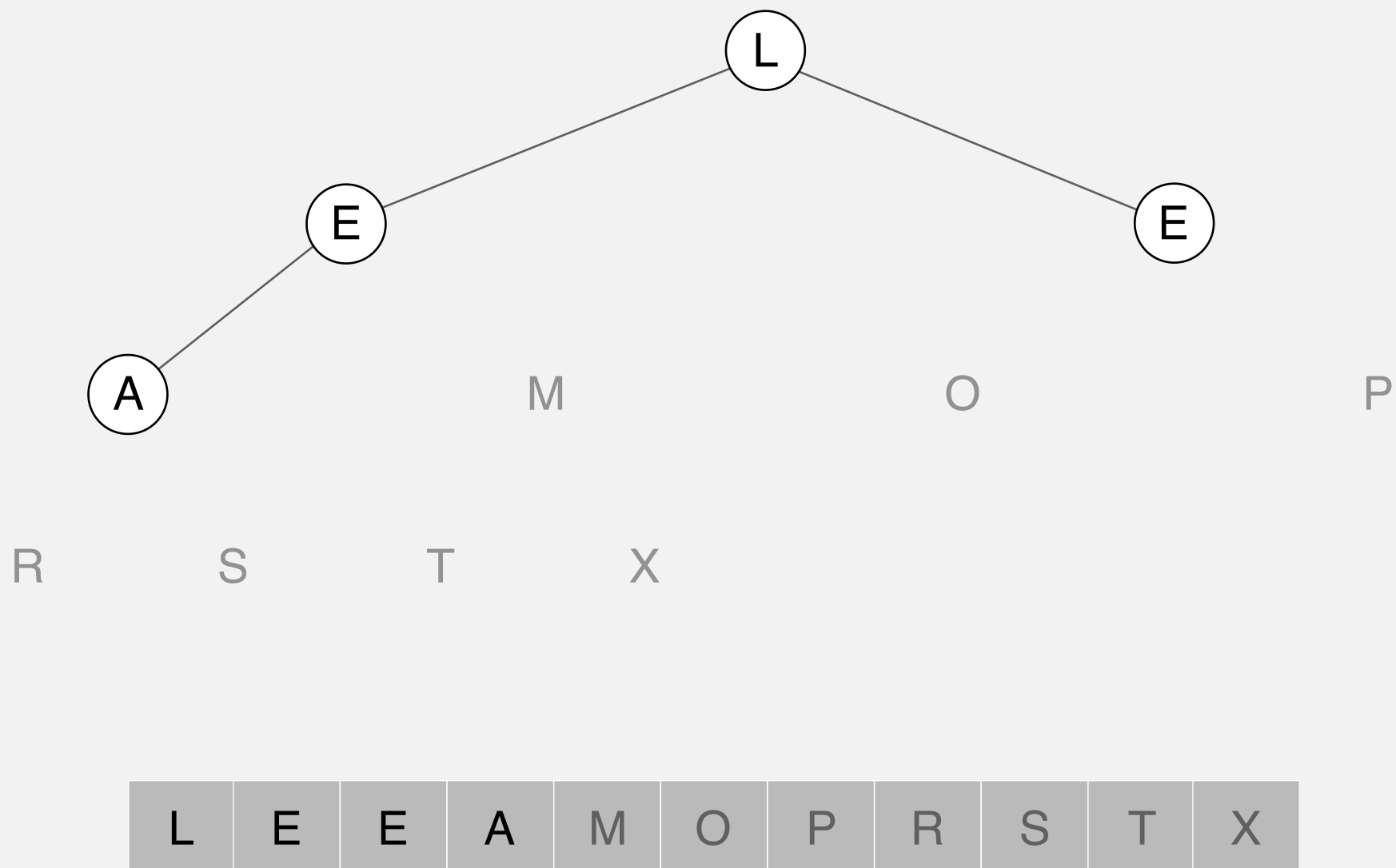
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

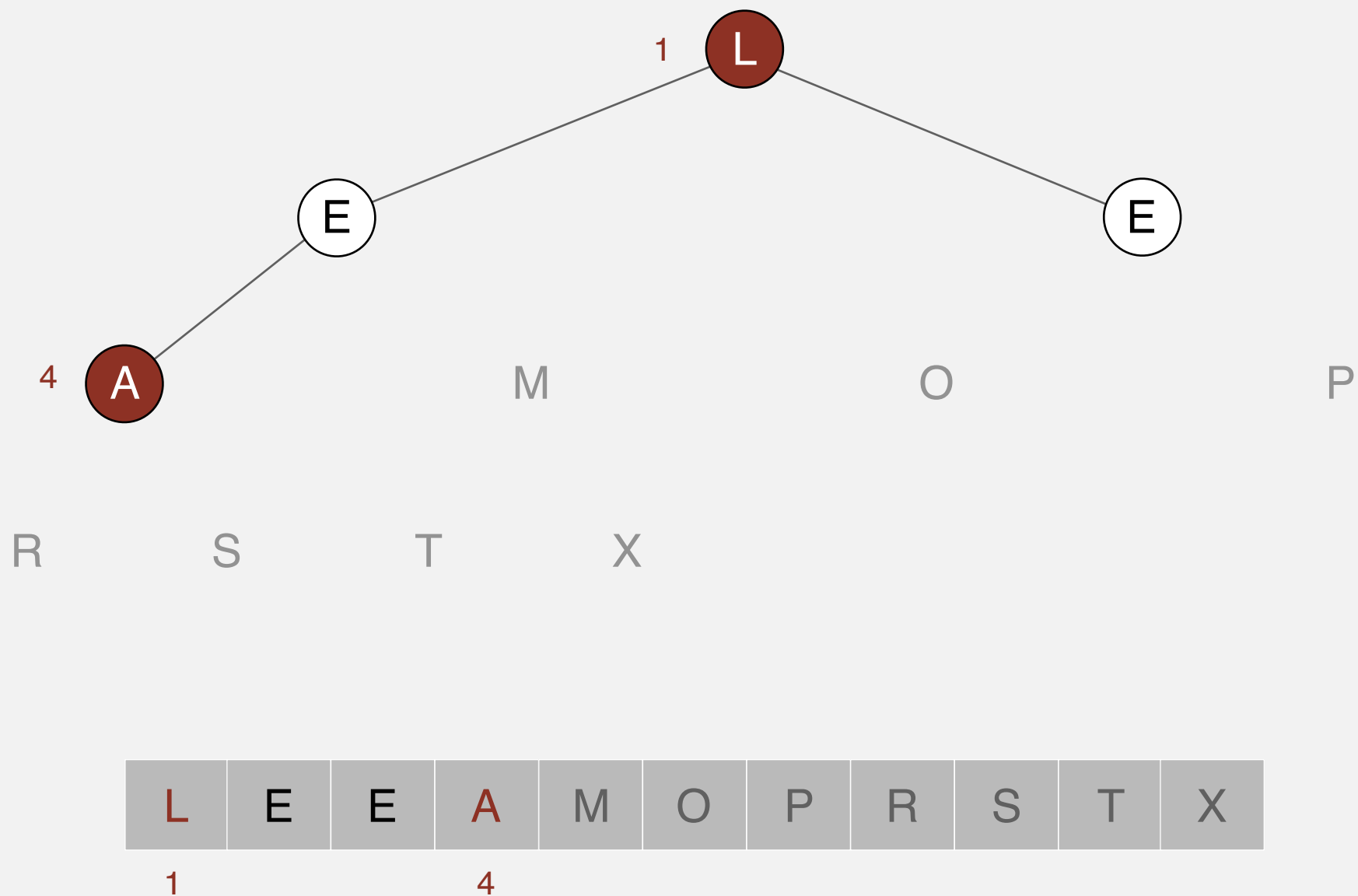
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

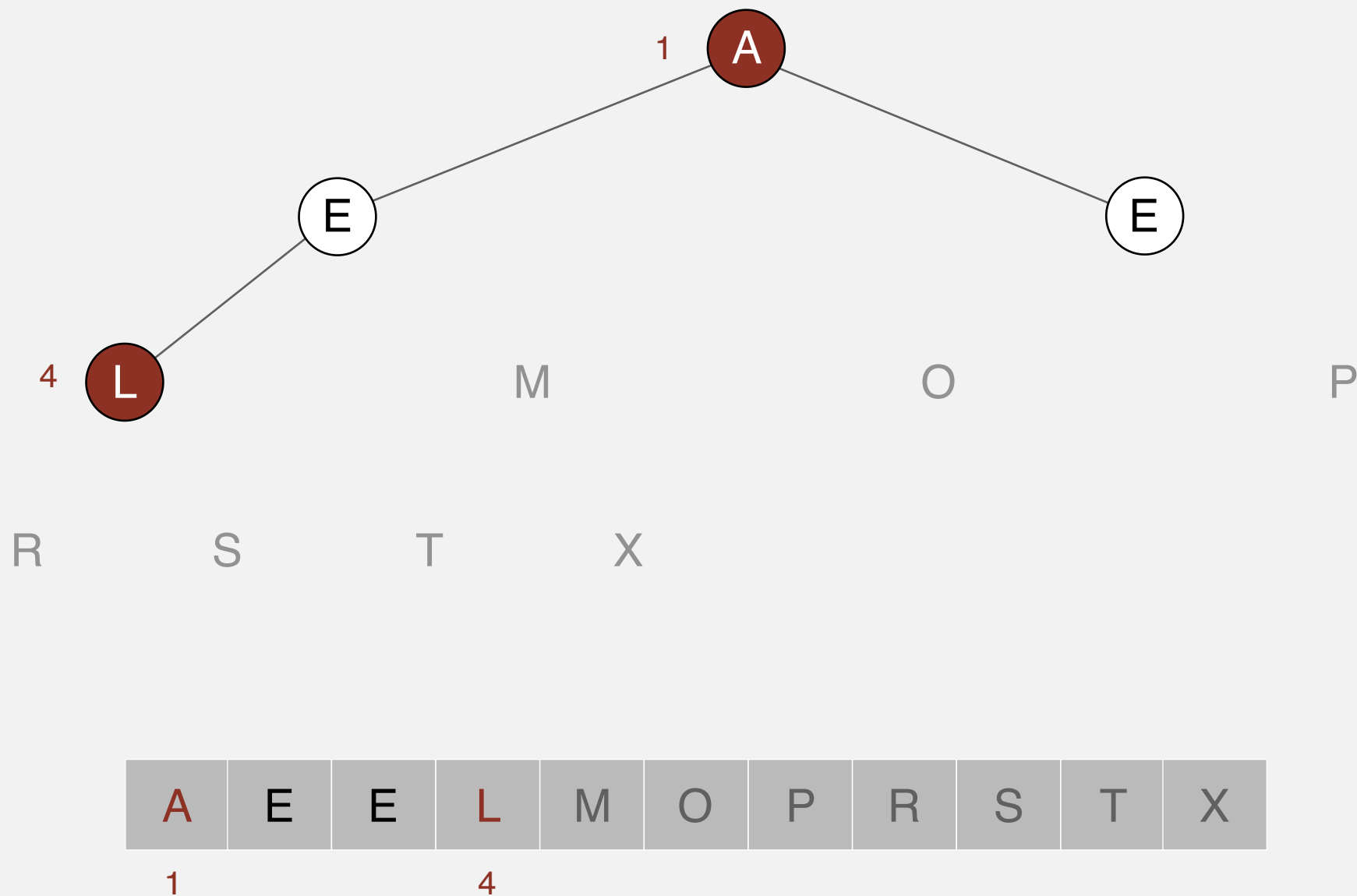
exchange 1 and 4



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

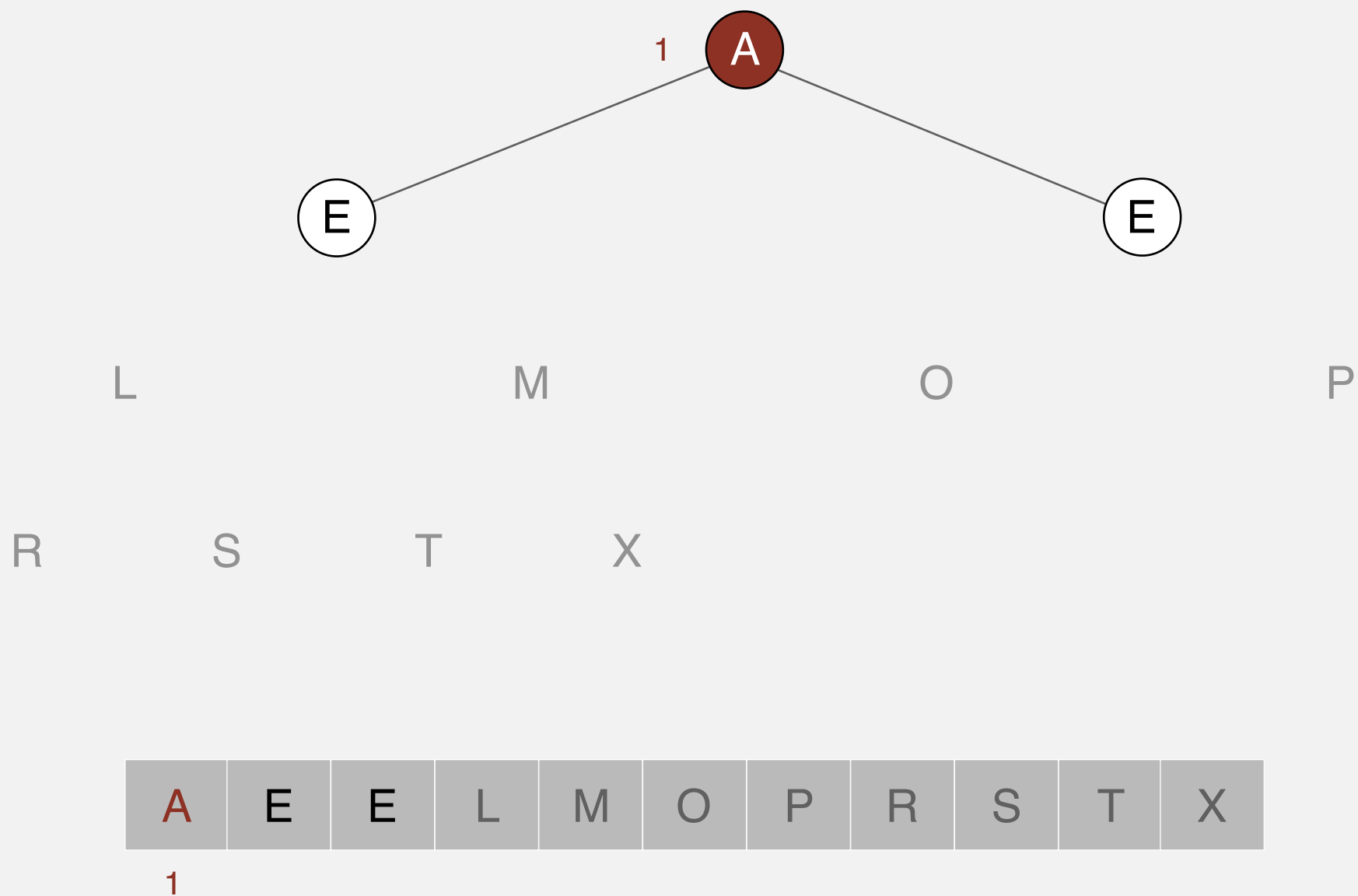
exchange 1 and 4



Heapsort demo

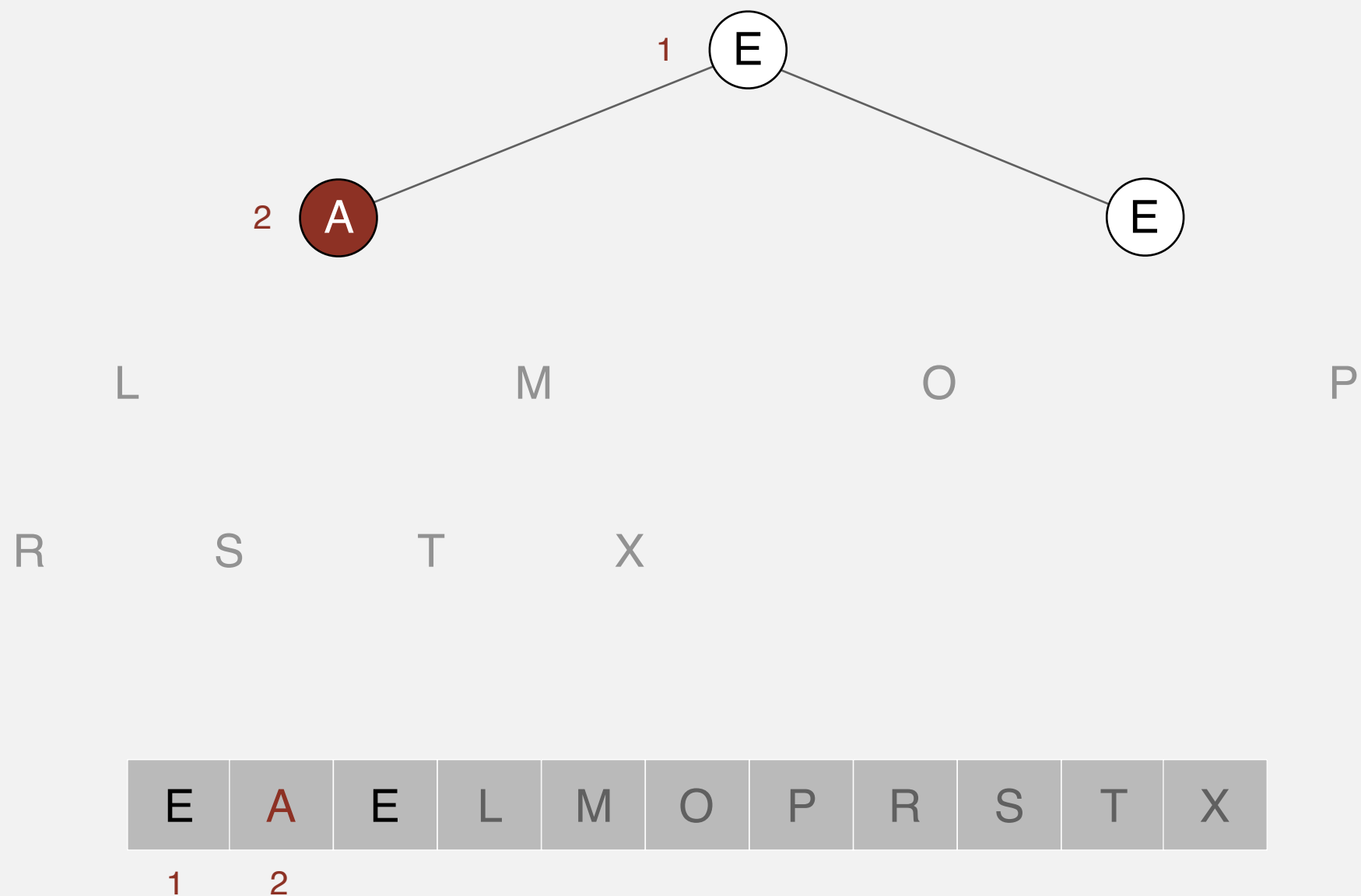
Sortdown. Repeatedly delete the largest remaining item.

sink 1



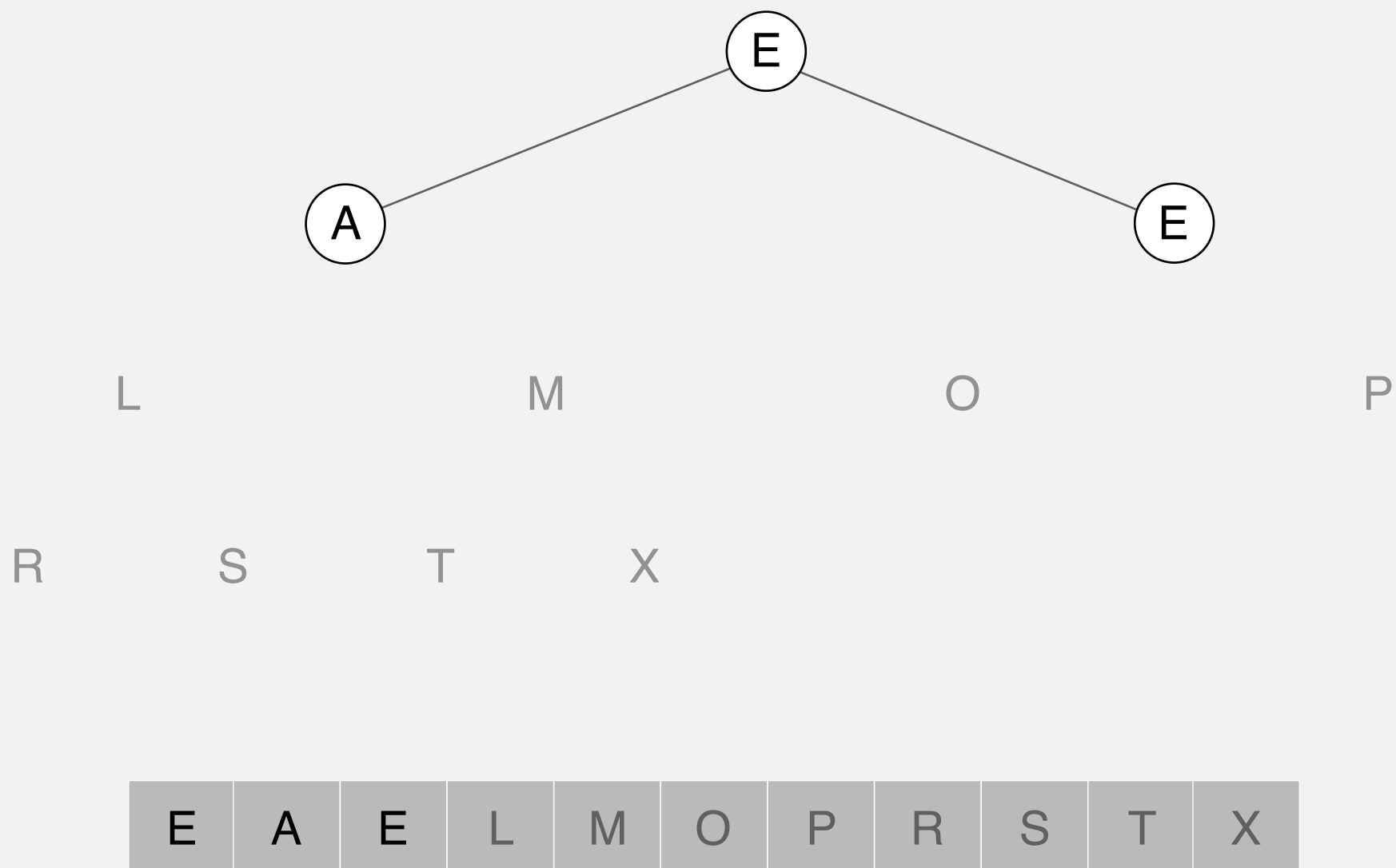
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

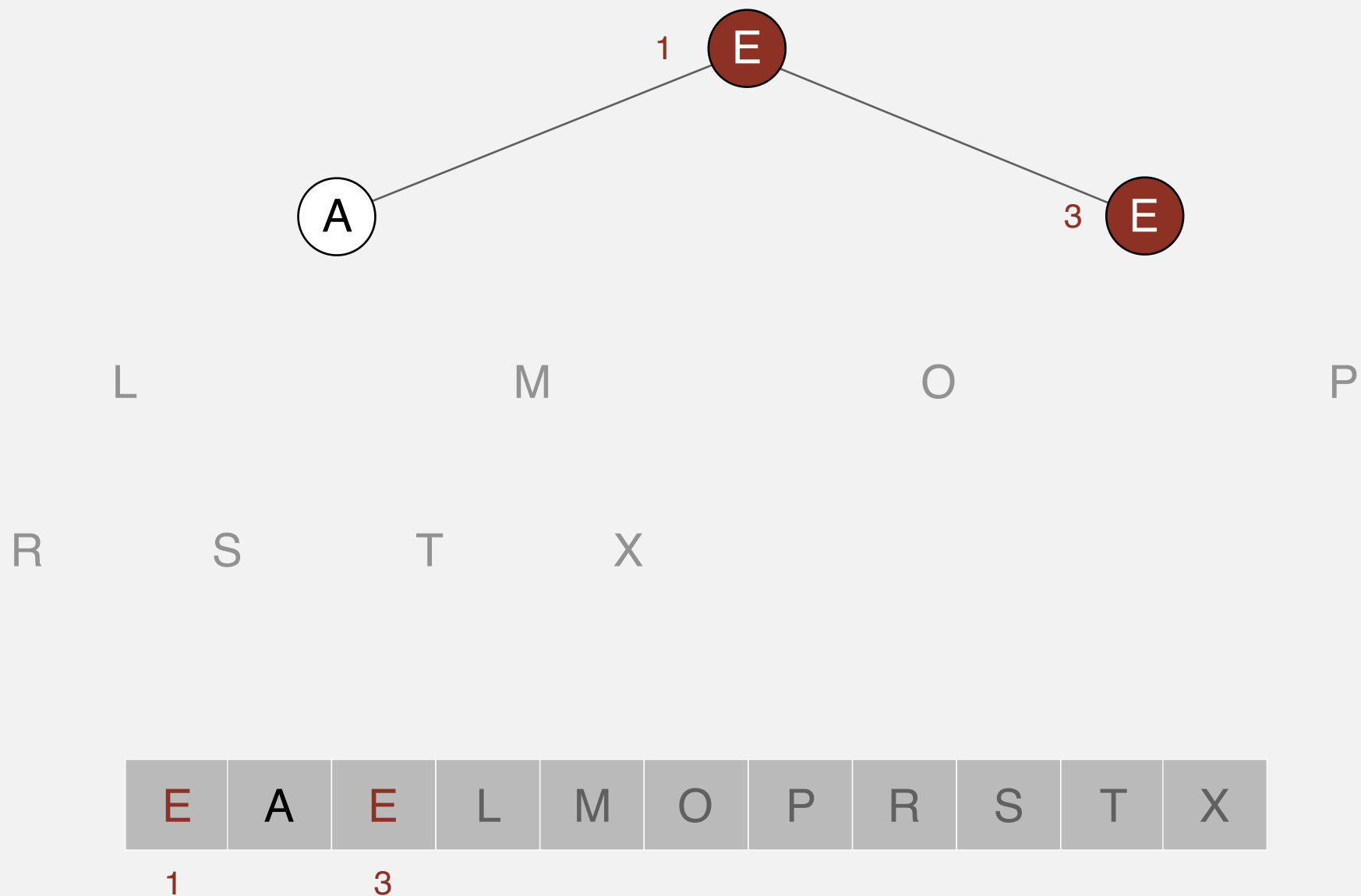
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

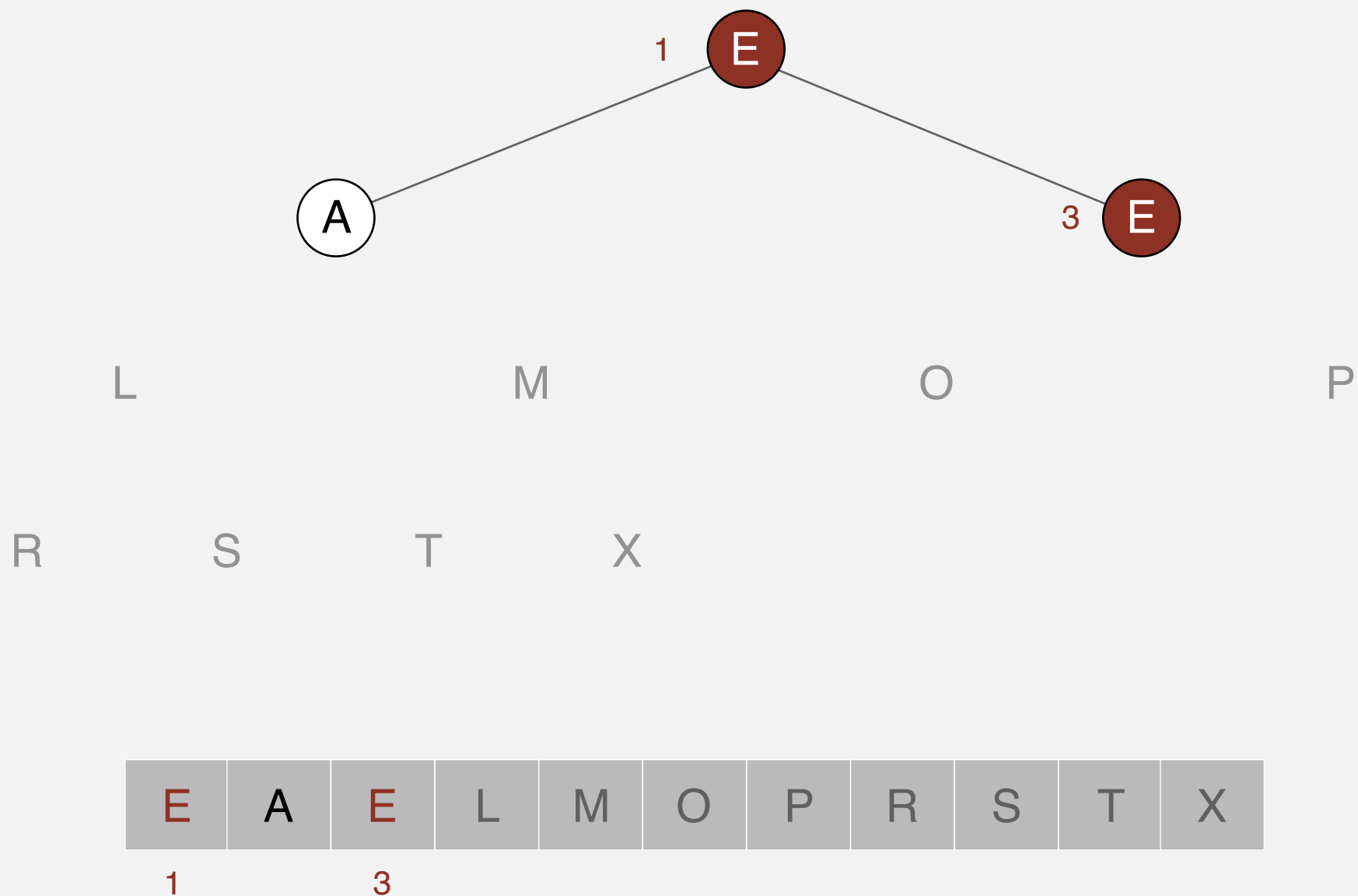
exchange 1 and 3



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

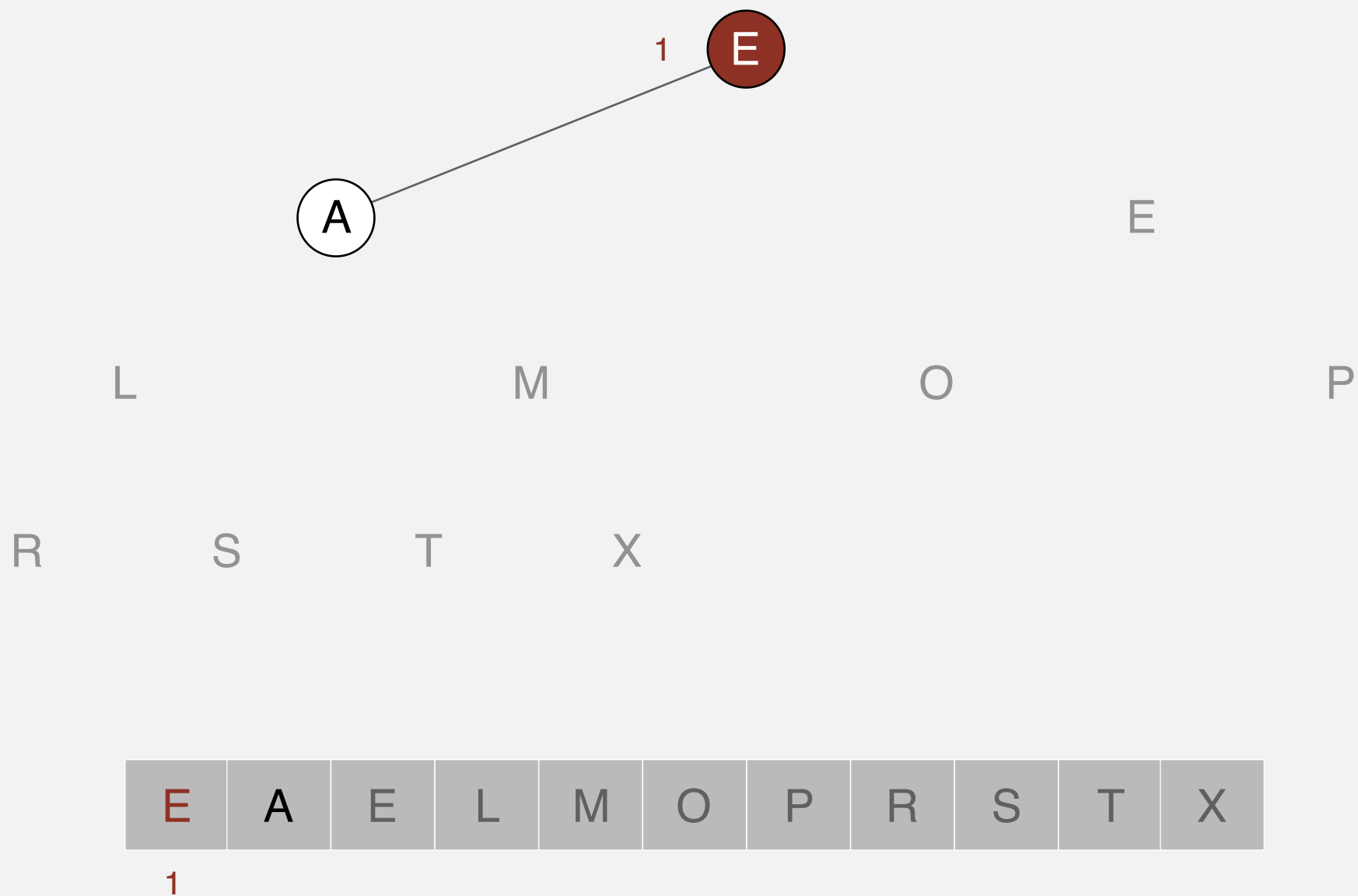
exchange 1 and 3



Heapsort demo

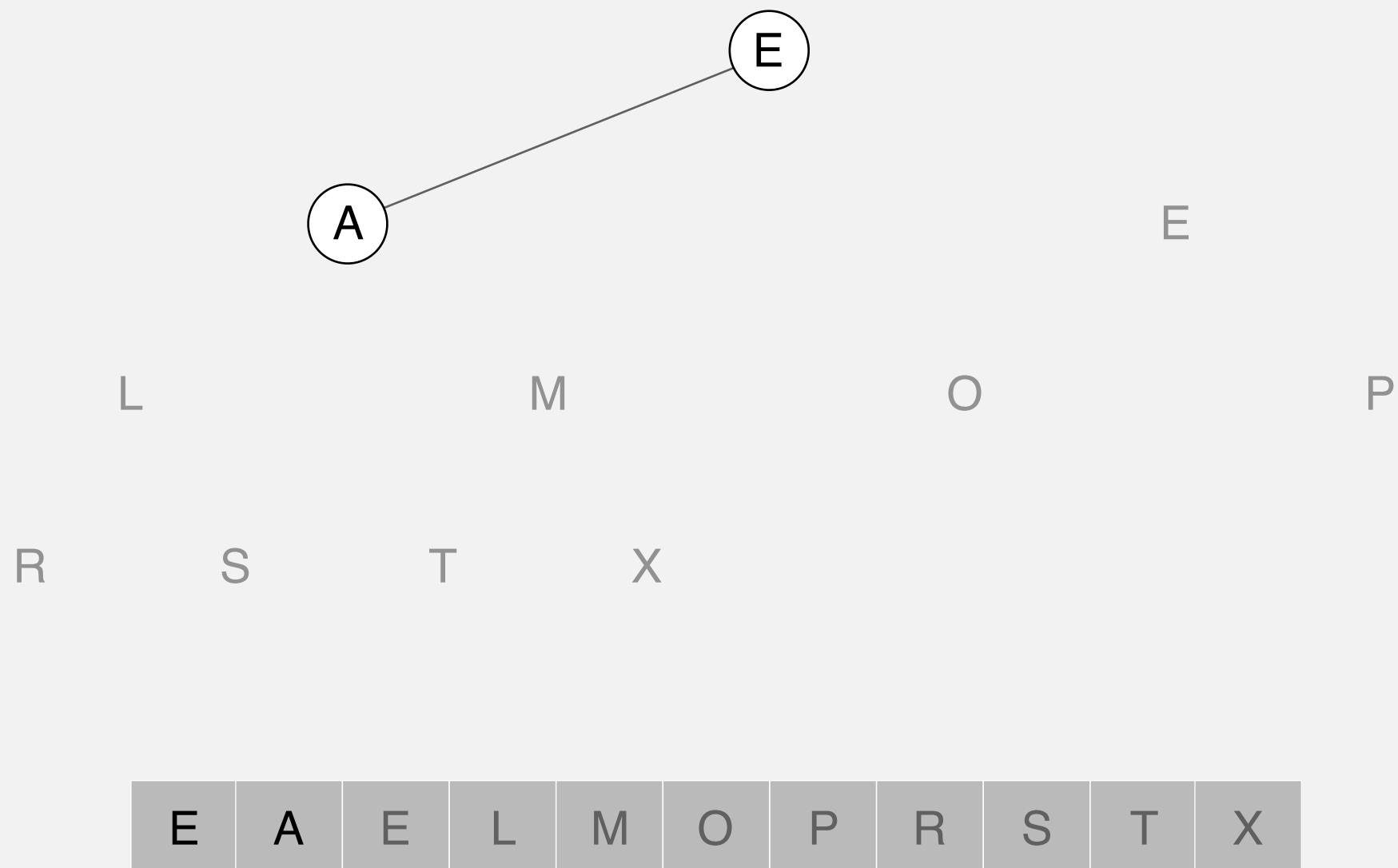
Sortdown. Repeatedly delete the largest remaining item.

sink 1



Heapsort demo

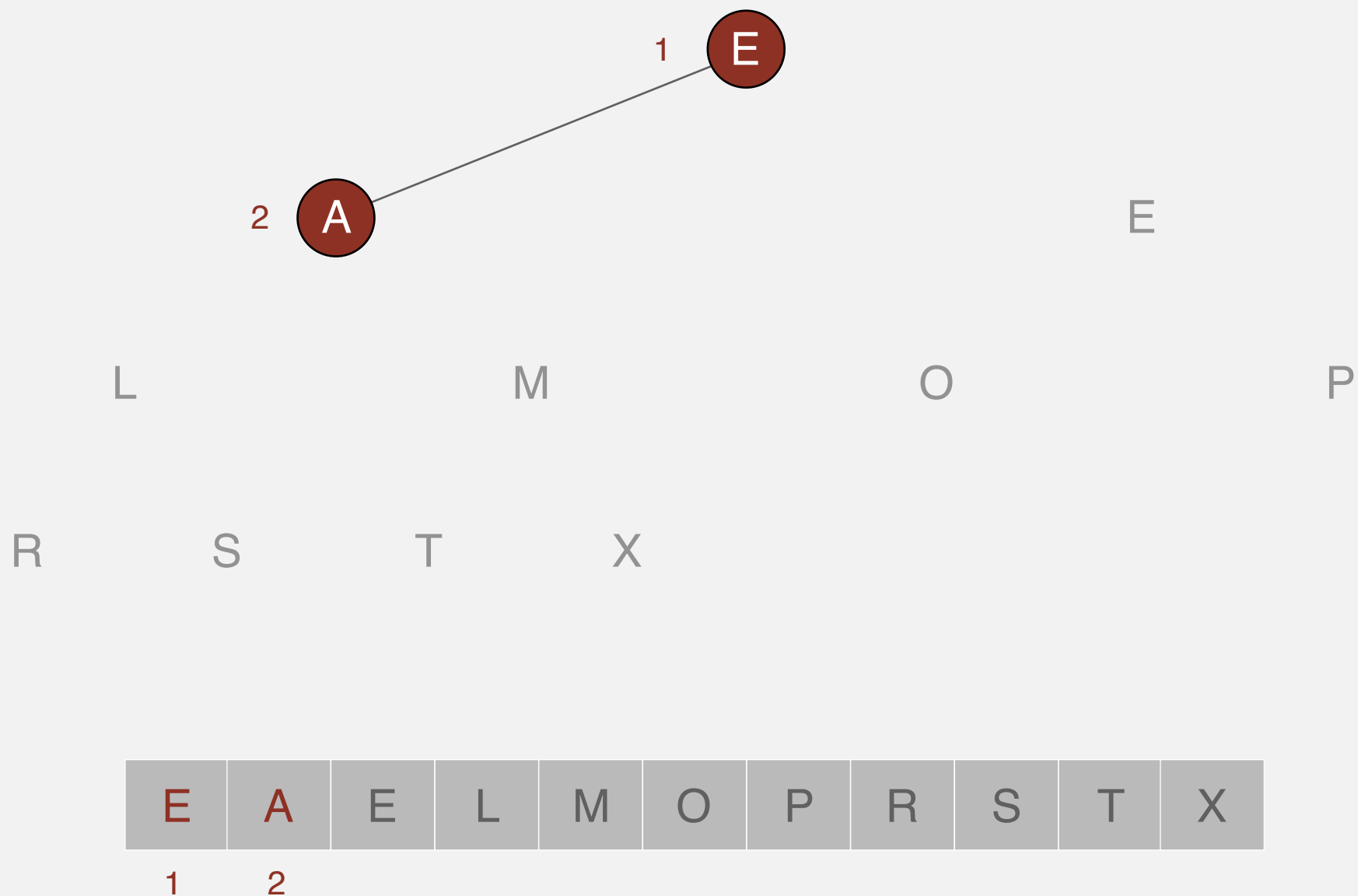
Sortdown. Repeatedly delete the largest remaining item.



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

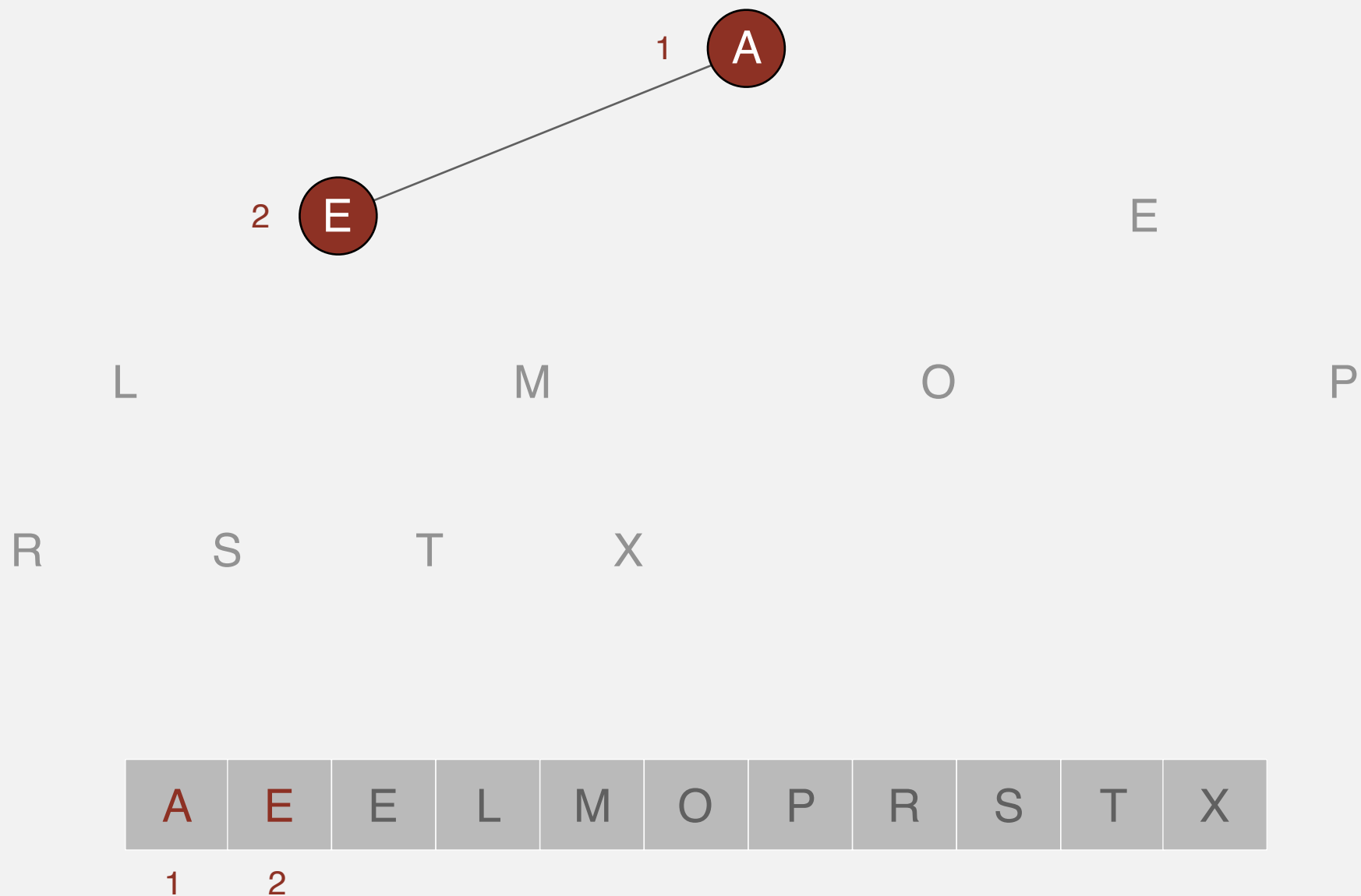
exchange 1 and 2



Heapsort demo

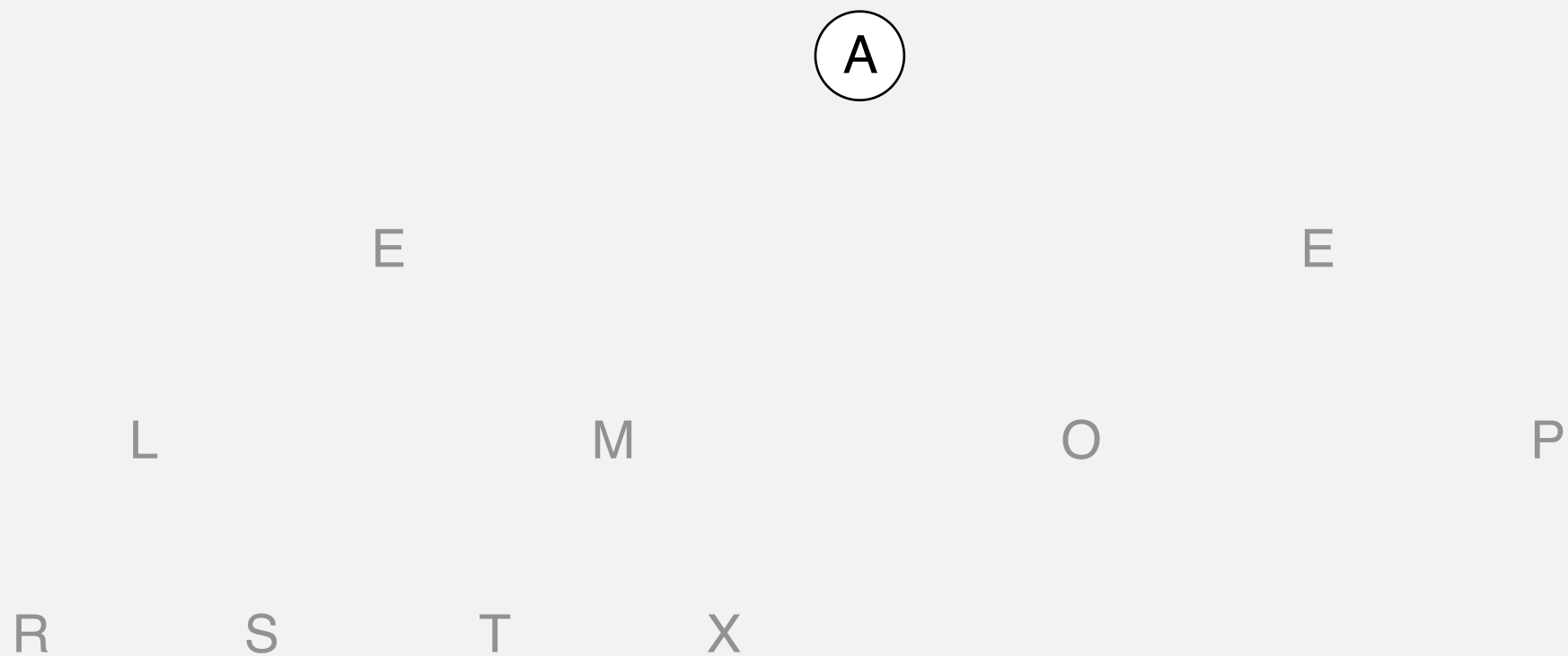
Sortdown. Repeatedly delete the largest remaining item.

exchange 1 and 2



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.



A	E	E	L	M	O	P	R	S	T	X
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Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

end of sortdown phase



Heapsort demo

Sortdown. Repeatedly delete the largest remaining item.

array in sorted order



A	E	E	L	M	O	P	R	S	T	X
1	2	3	4	5	6	7	8	9	10	11