

Sorting Algorithms

1. Selection

2. Bubble

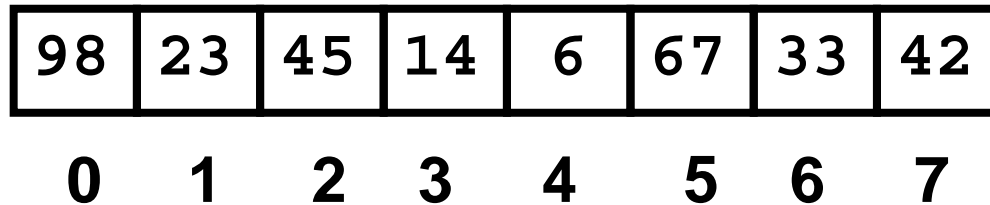
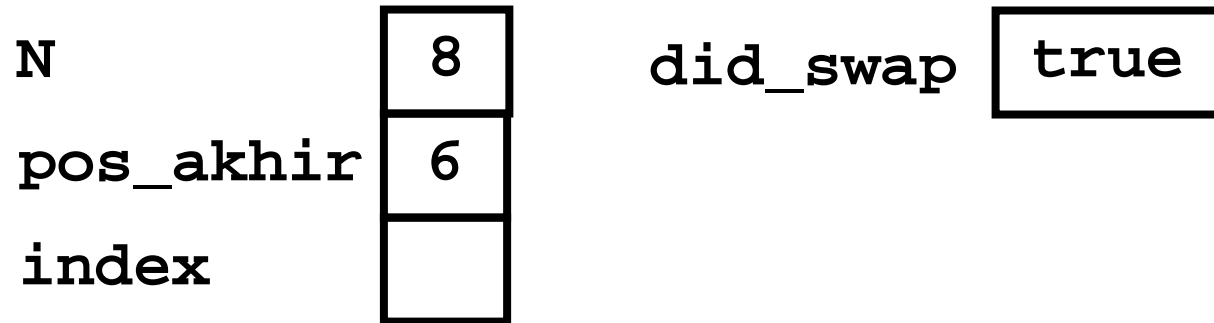
3. Insertion

4. Merge

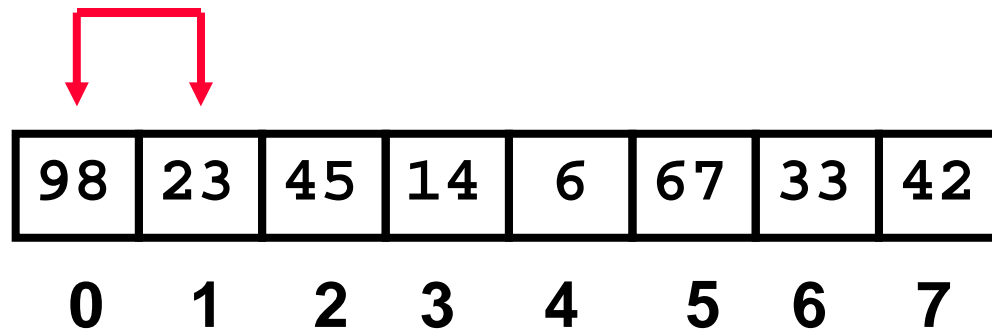
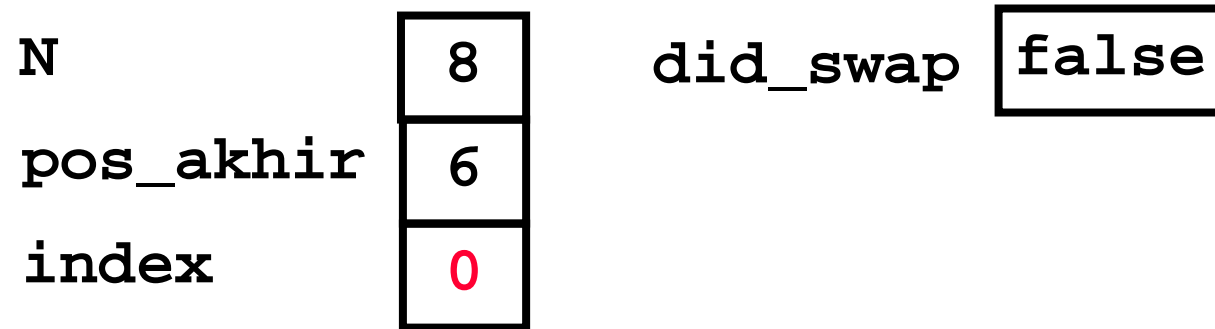
5. Quick

6. Shell

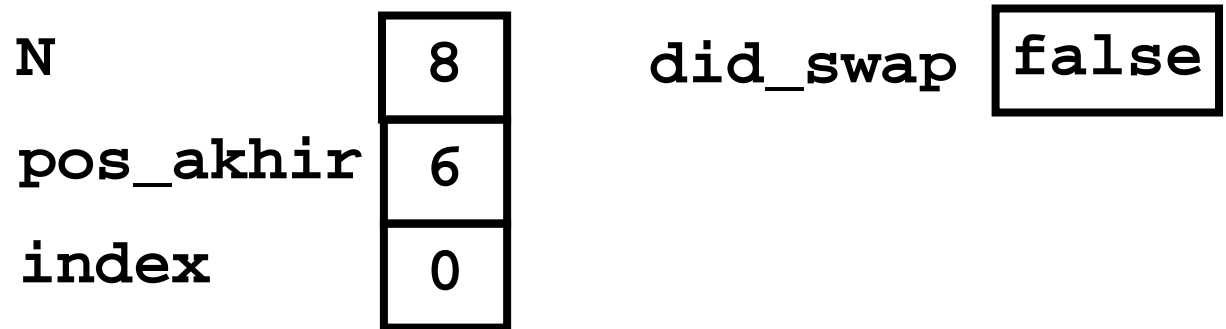
An Animated Example



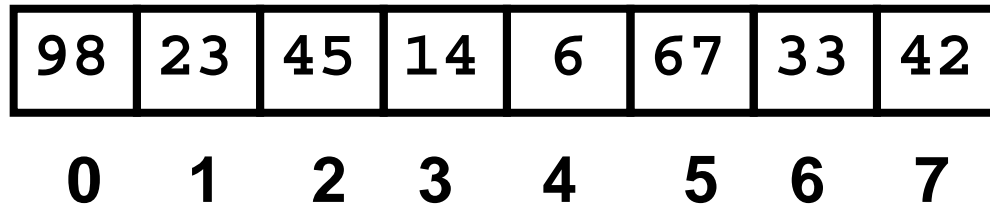
An Animated Example



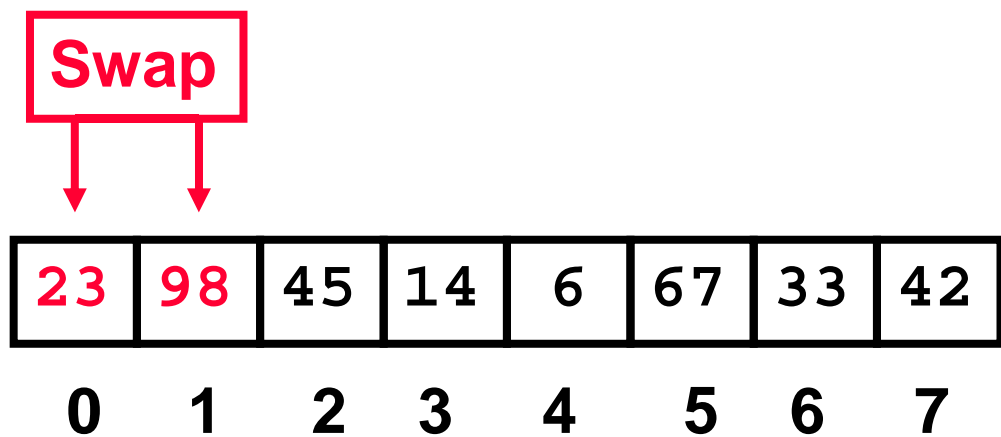
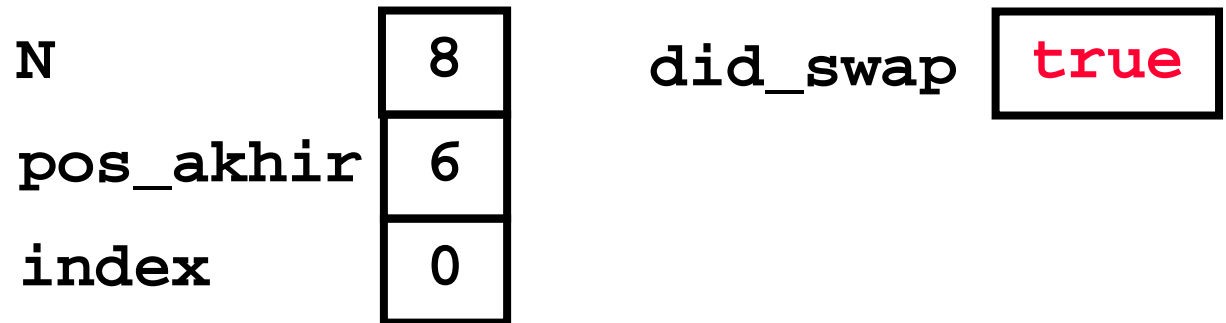
An Animated Example



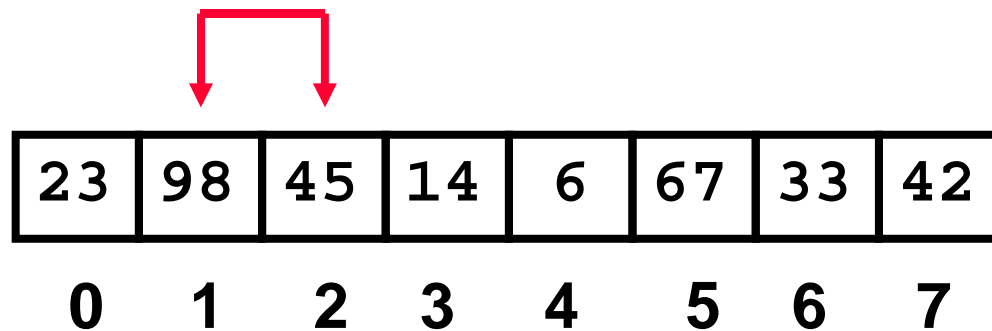
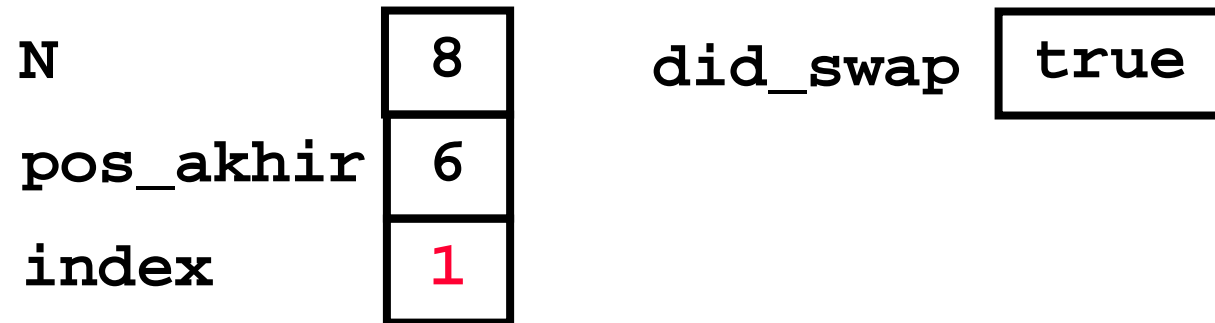
Swap



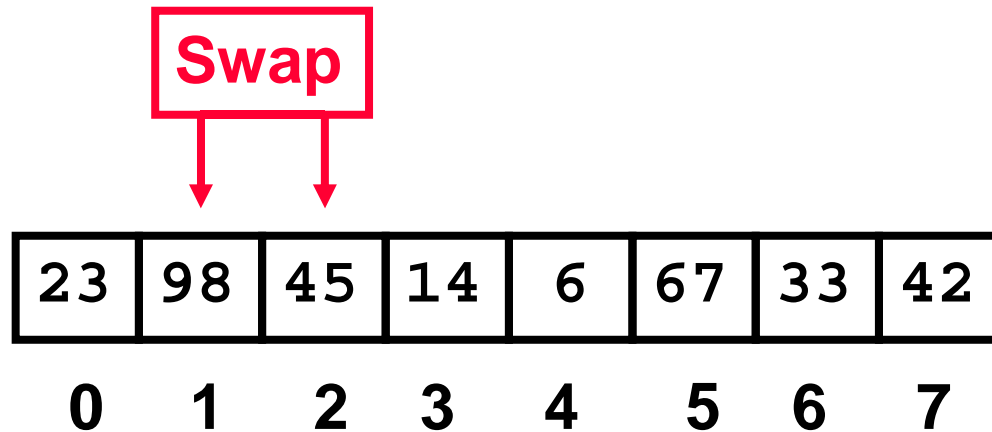
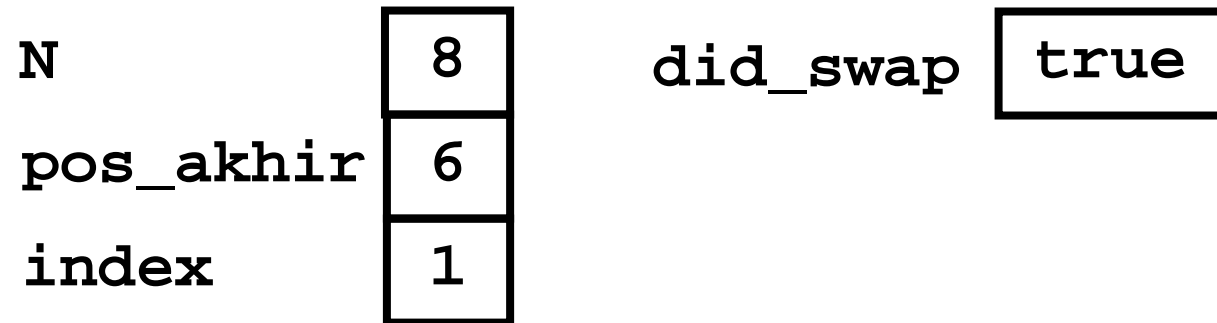
An Animated Example



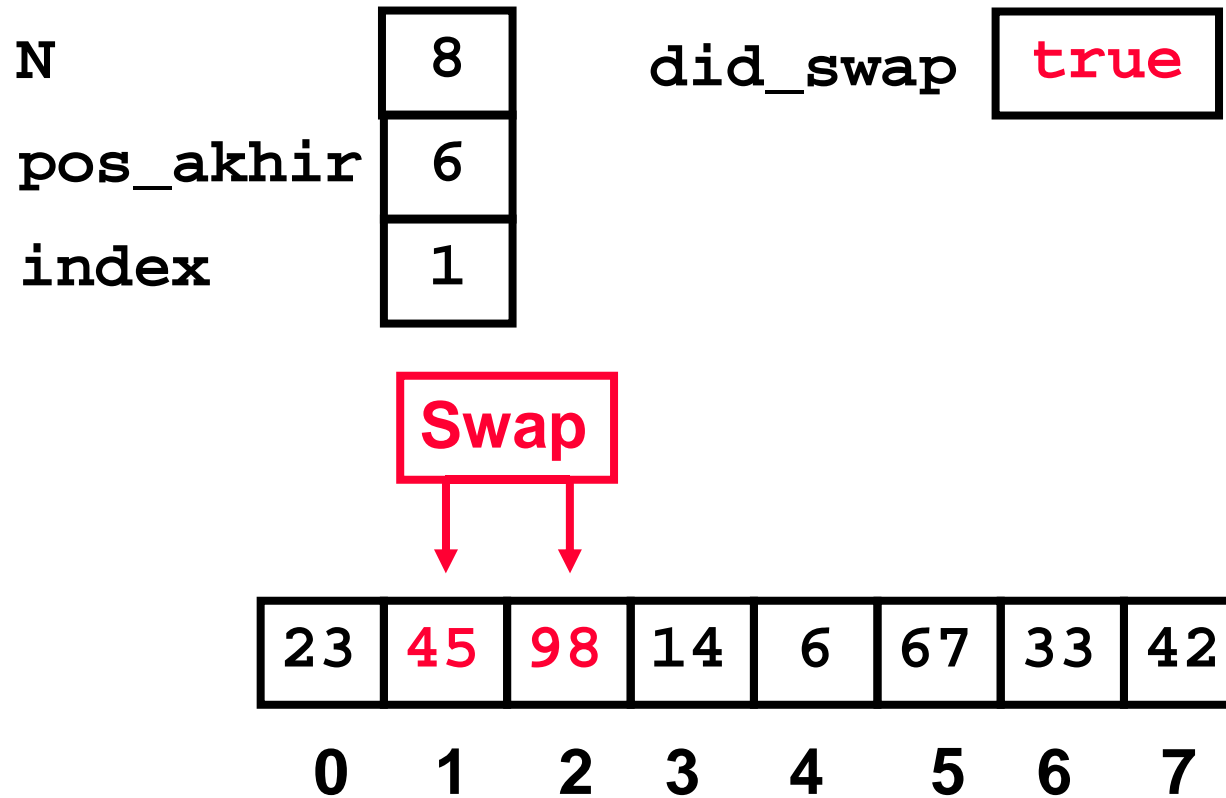
An Animated Example



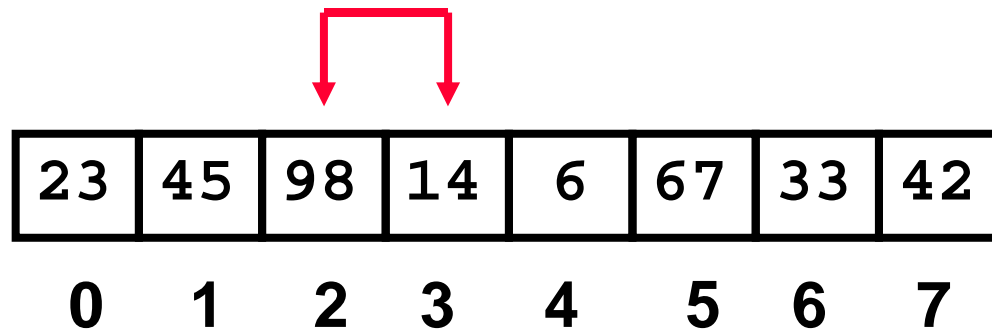
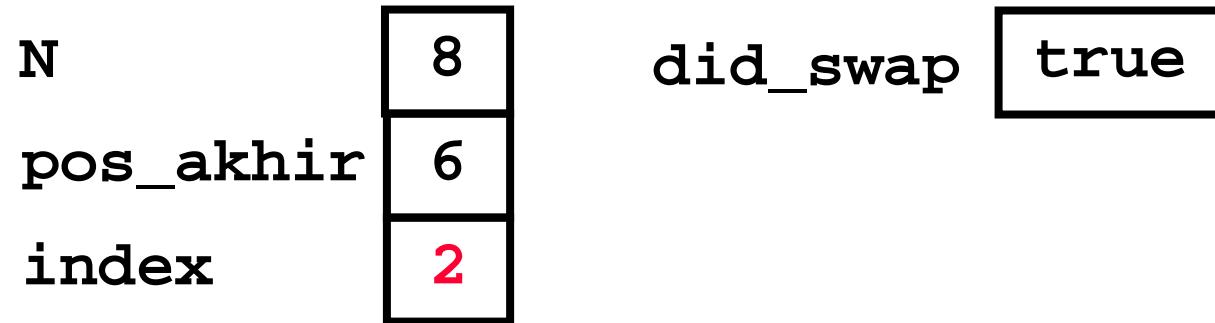
An Animated Example



An Animated Example



An Animated Example



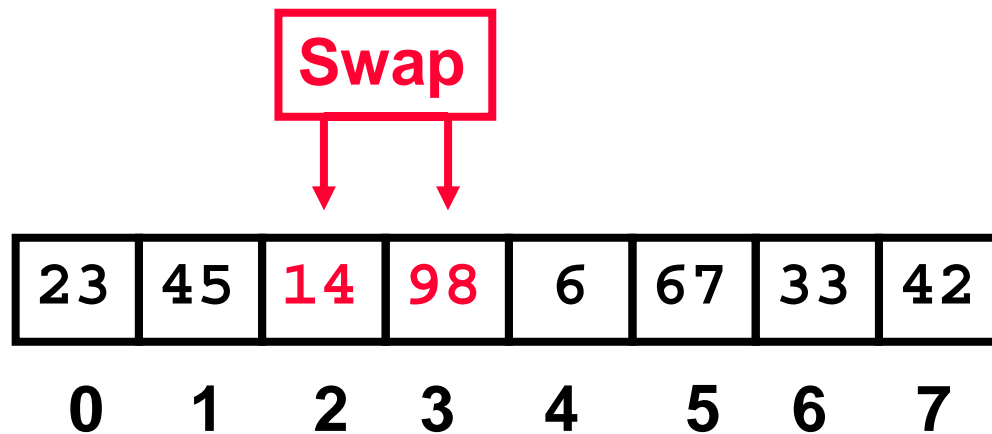
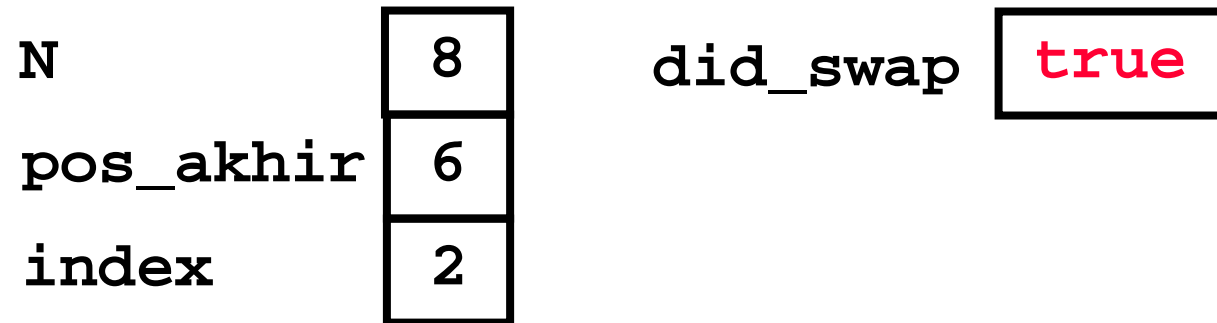
An Animated Example

N 8 did_swap true
pos_akhir 6
index 2

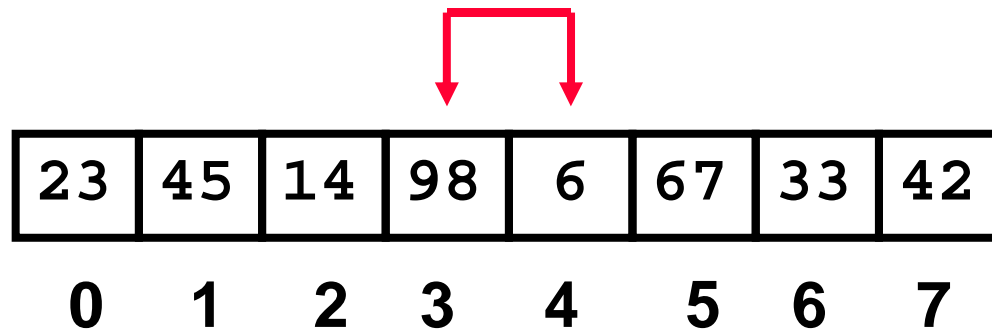
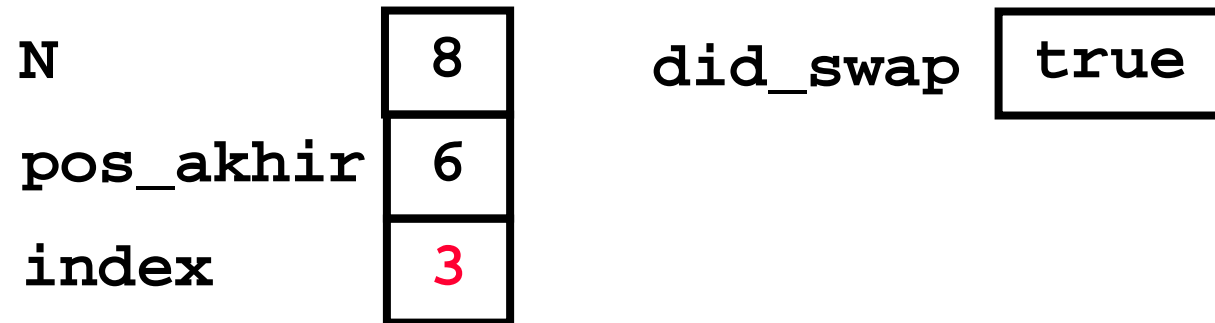
Swap

23	45	98	14	6	67	33	42
0	1	2	3	4	5	6	7

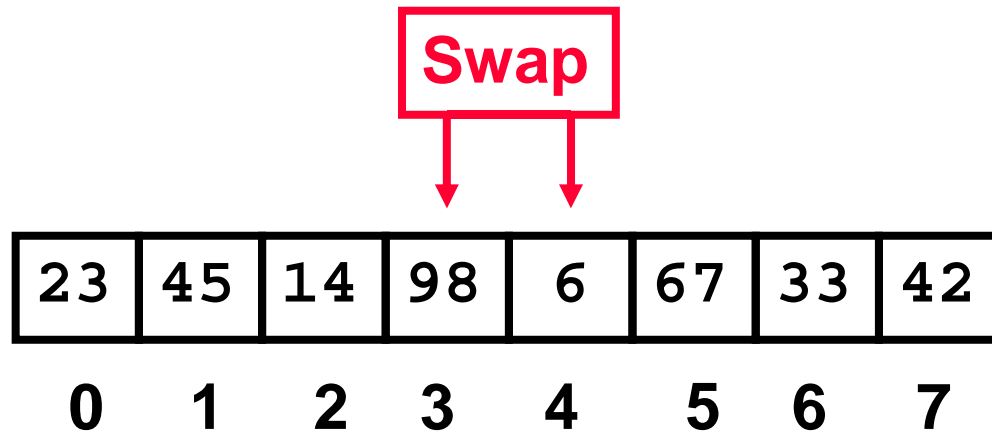
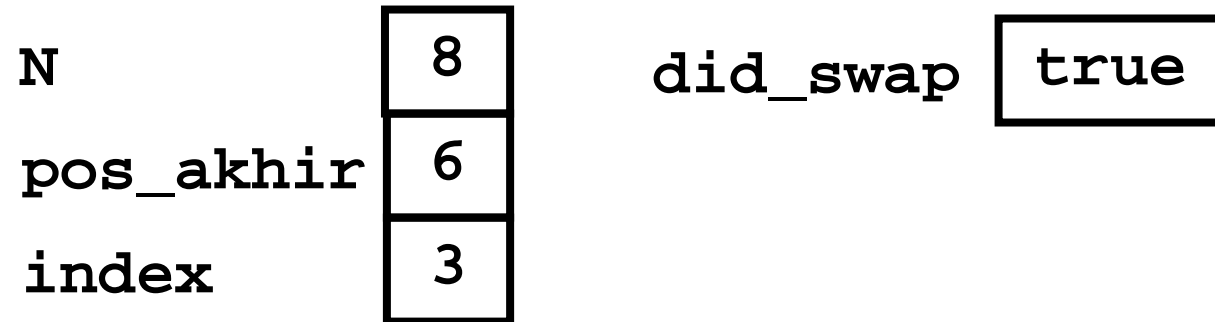
An Animated Example



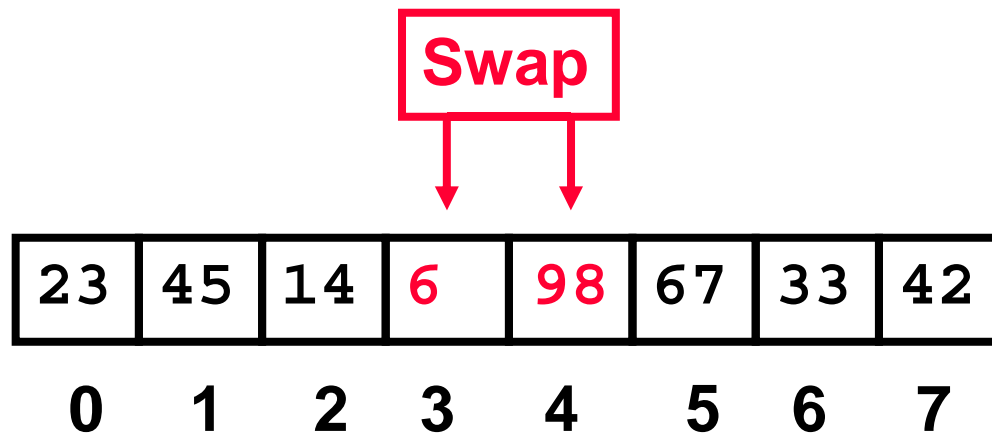
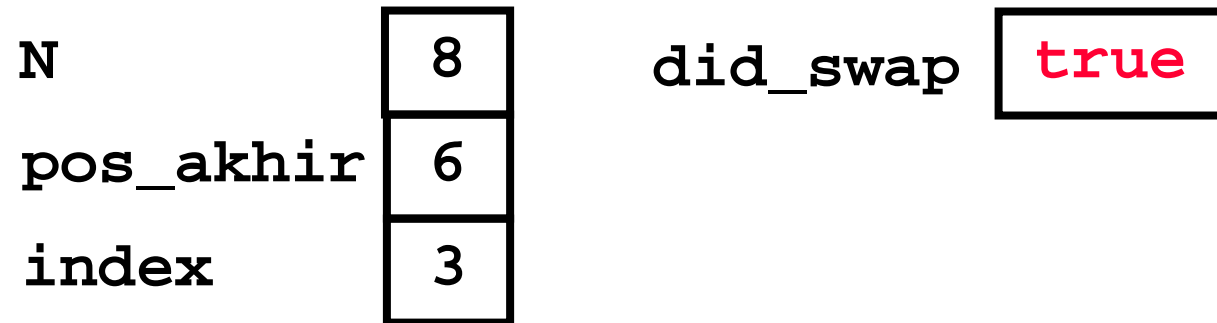
An Animated Example



An Animated Example



An Animated Example

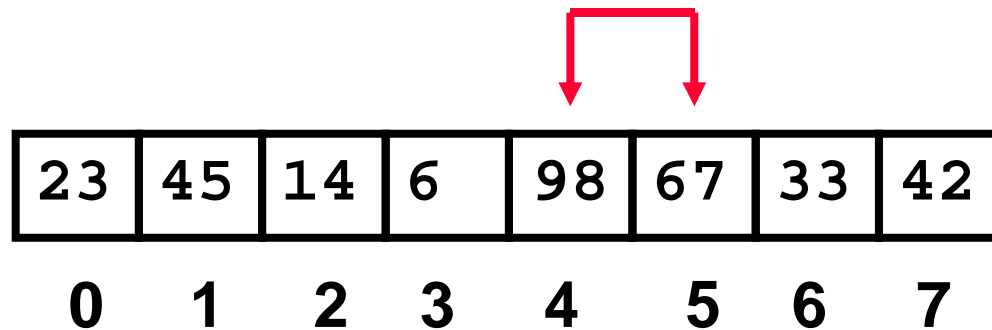


An Animated Example

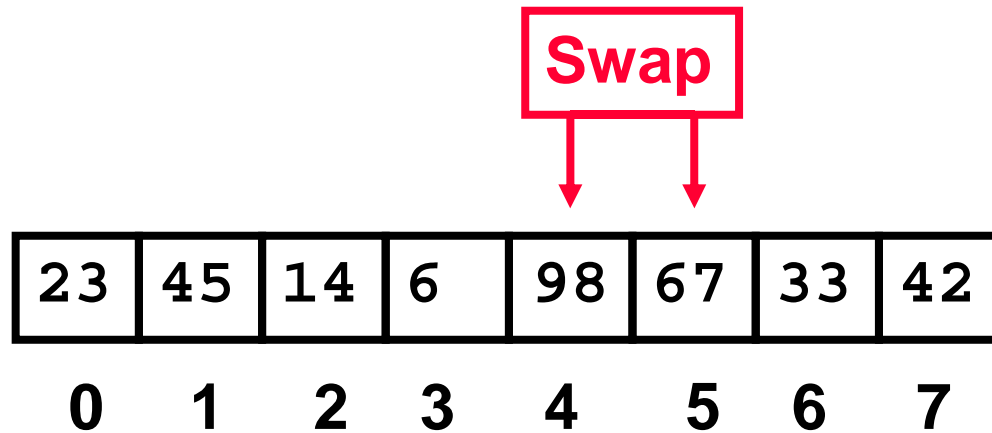
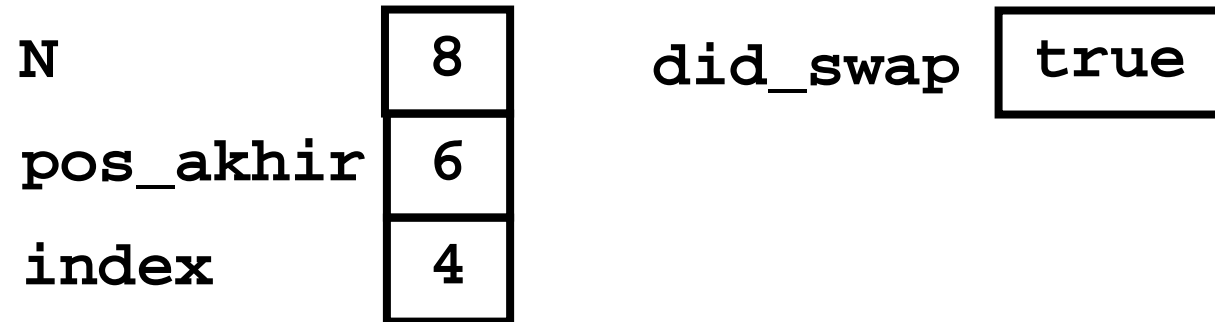
N 8 did_swap true

pos_akhir 6

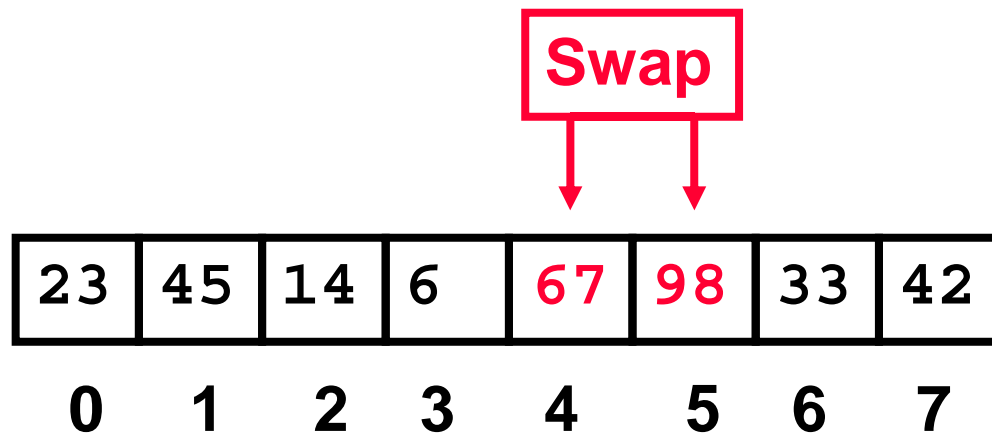
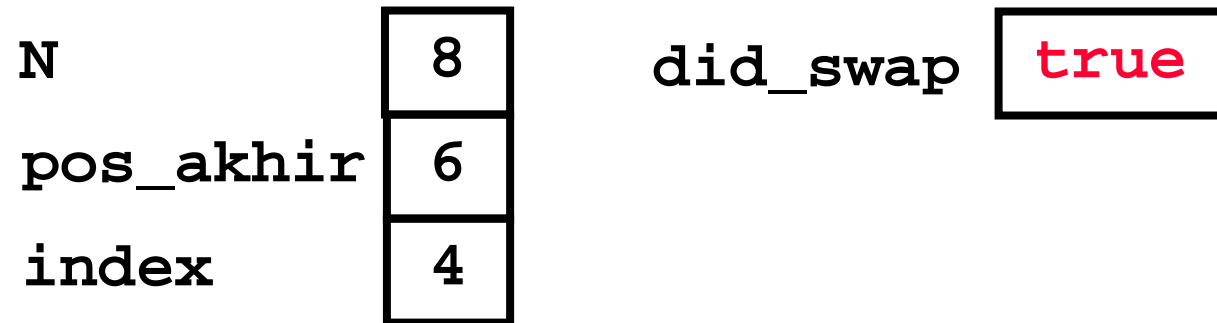
index 4



An Animated Example



An Animated Example



An Animated Example

N

8

 did_swap

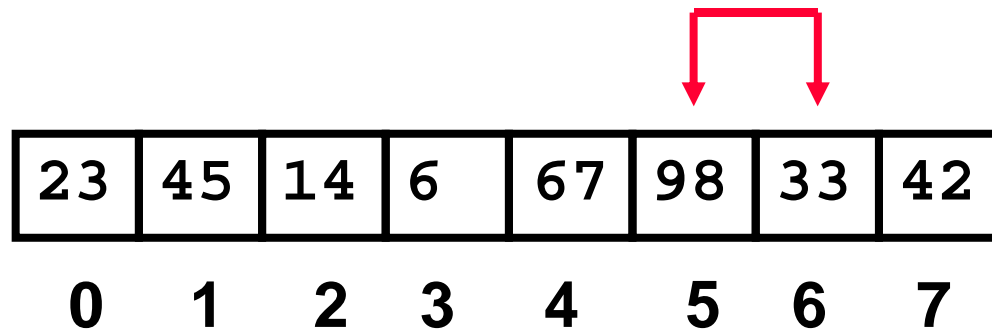
true

pos_akhir

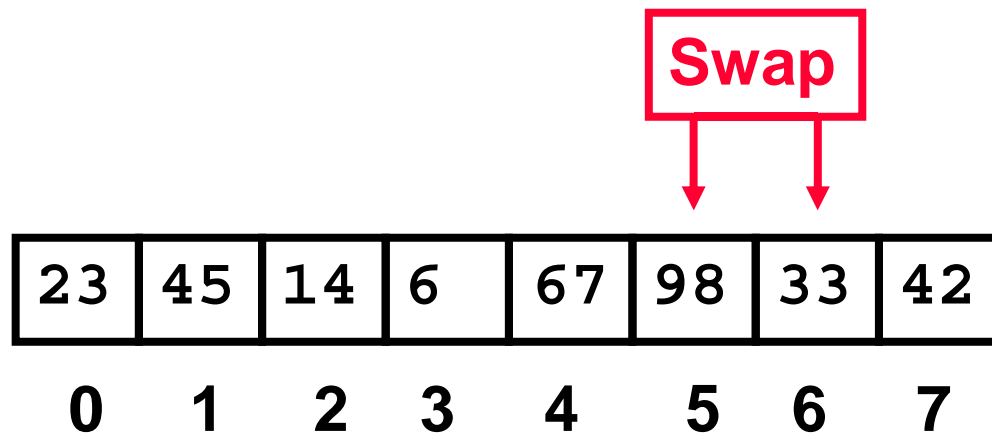
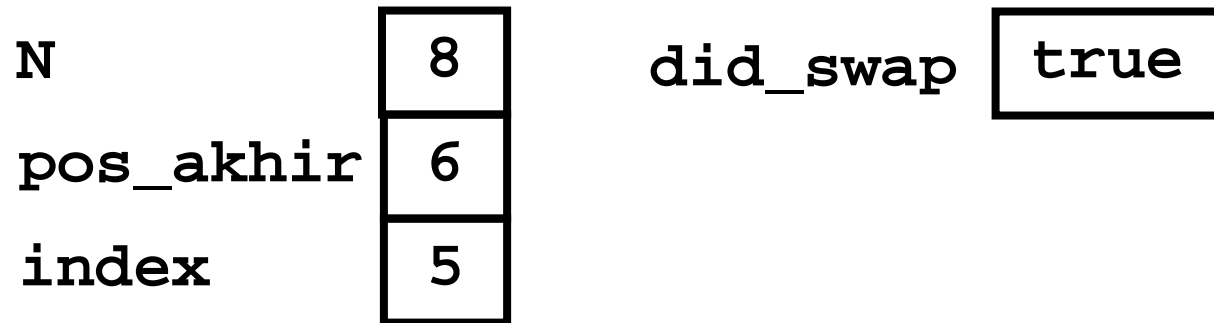
6

index

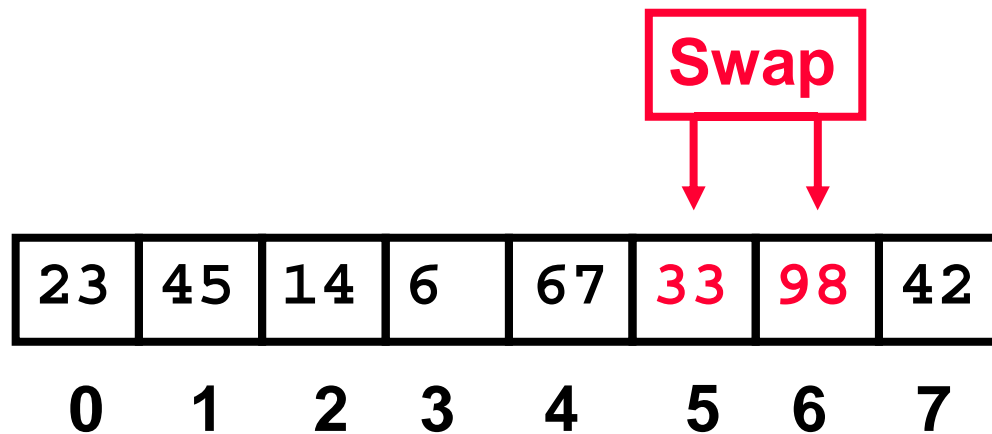
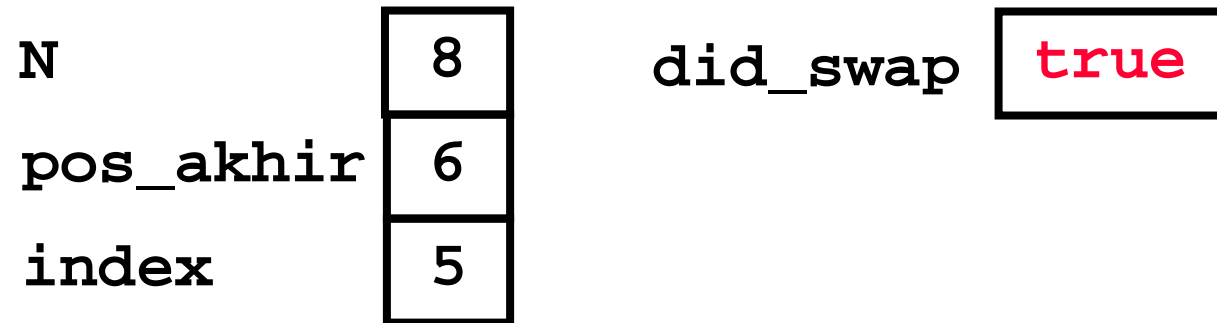
5



An Animated Example

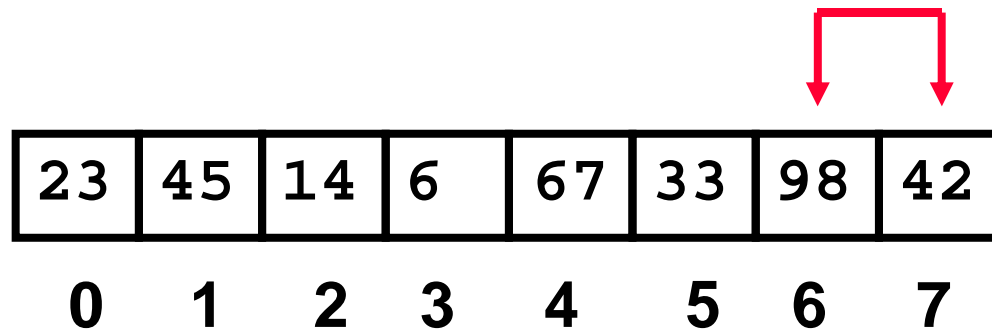


An Animated Example

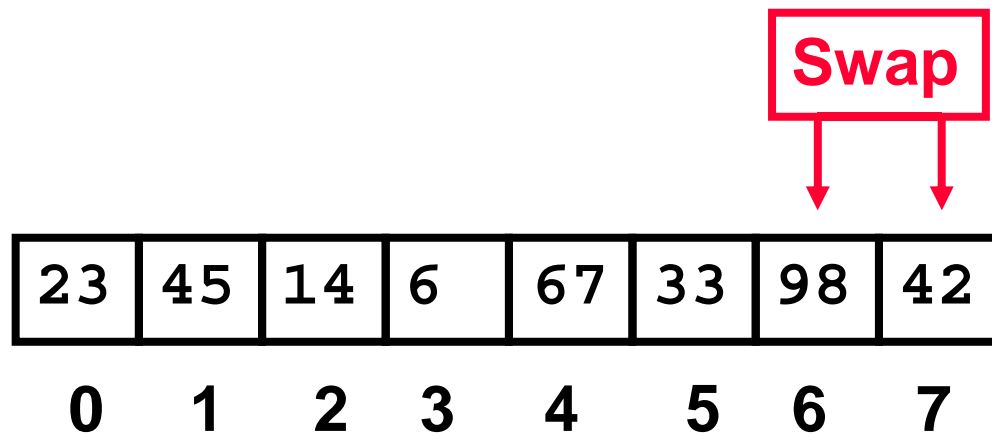
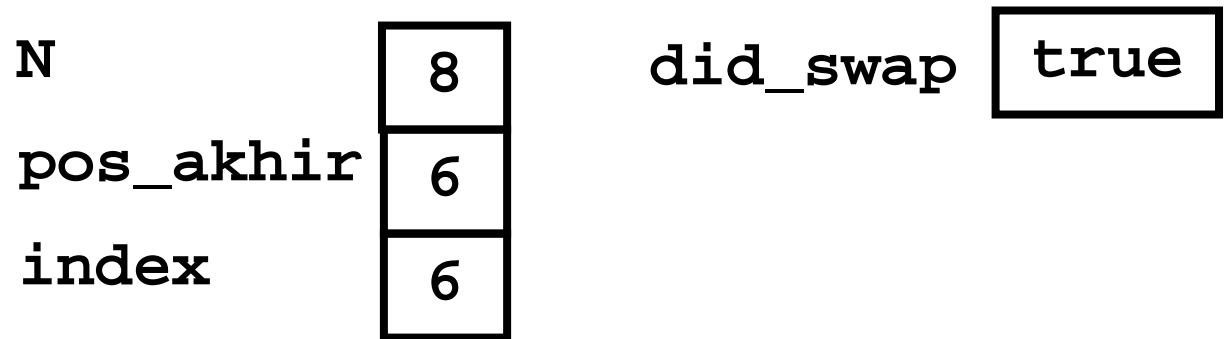


An Animated Example

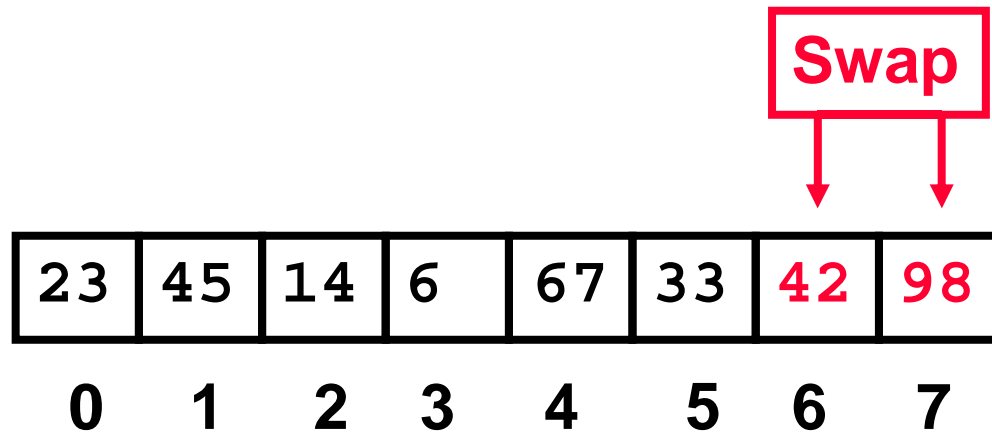
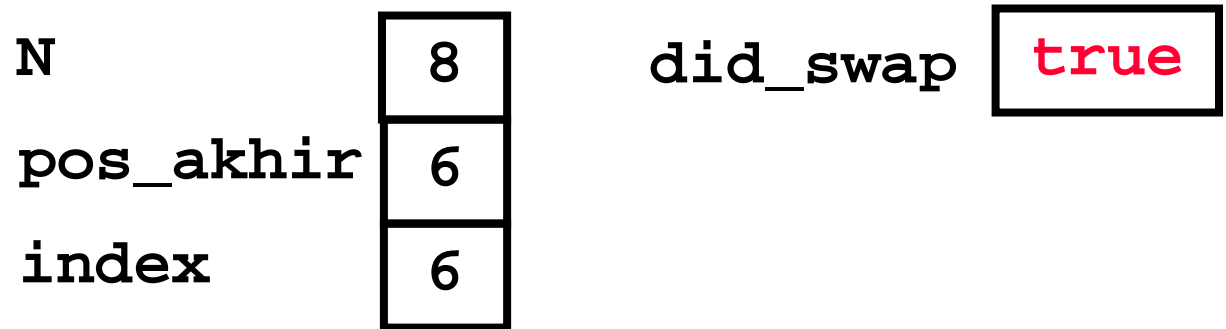
N 8 did_swap true
pos_akhir 6
index 6



An Animated Example



An Animated Example

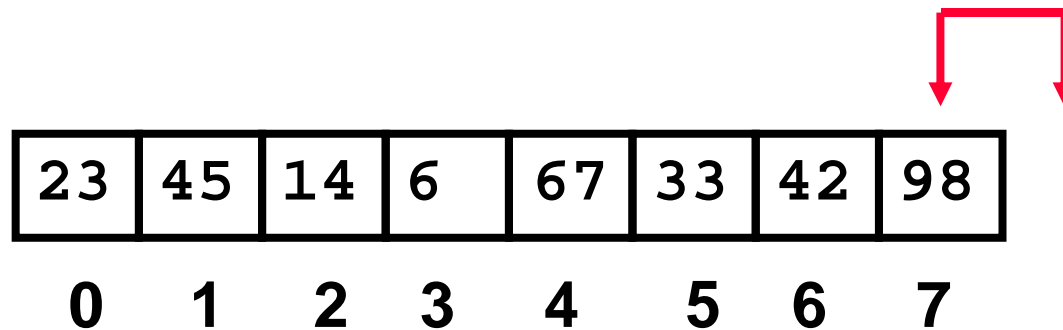


After First Pass of Outer Loop

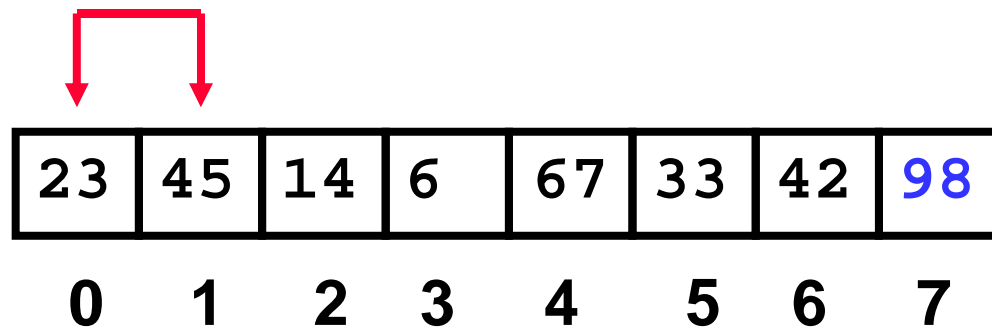
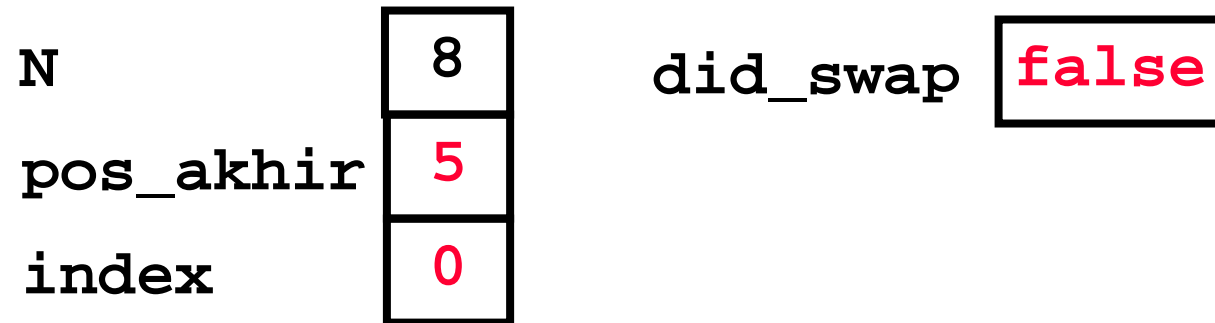
N 8 did_swap true

pos_akhir 6

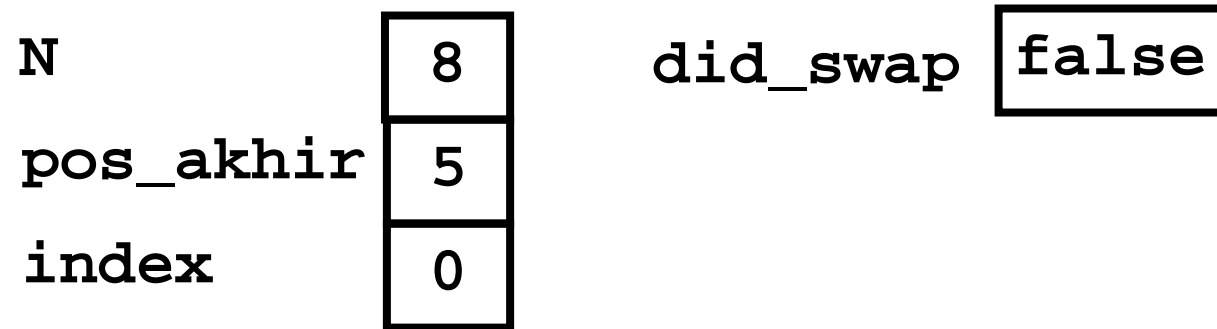
index 7 Finished first "Bubble Up"



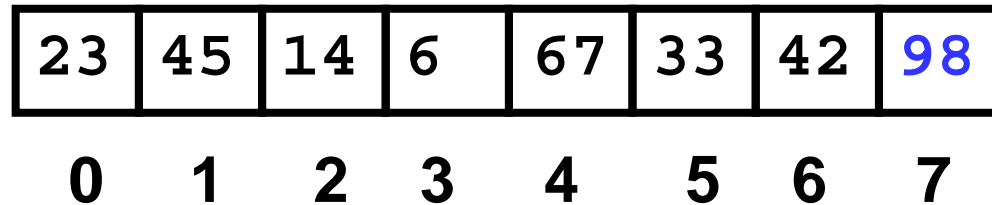
The Second “Bubble Up”



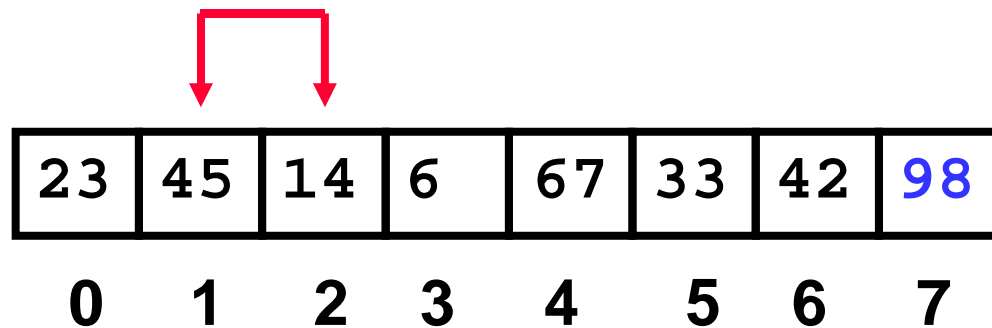
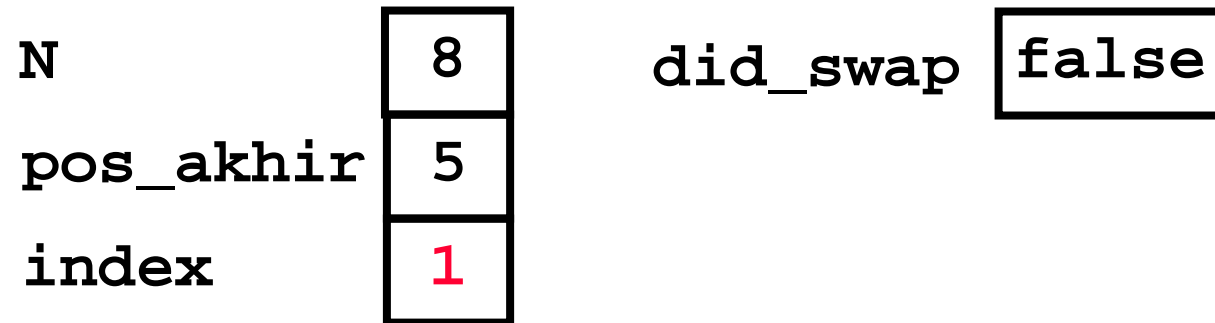
The Second "Bubble Up"



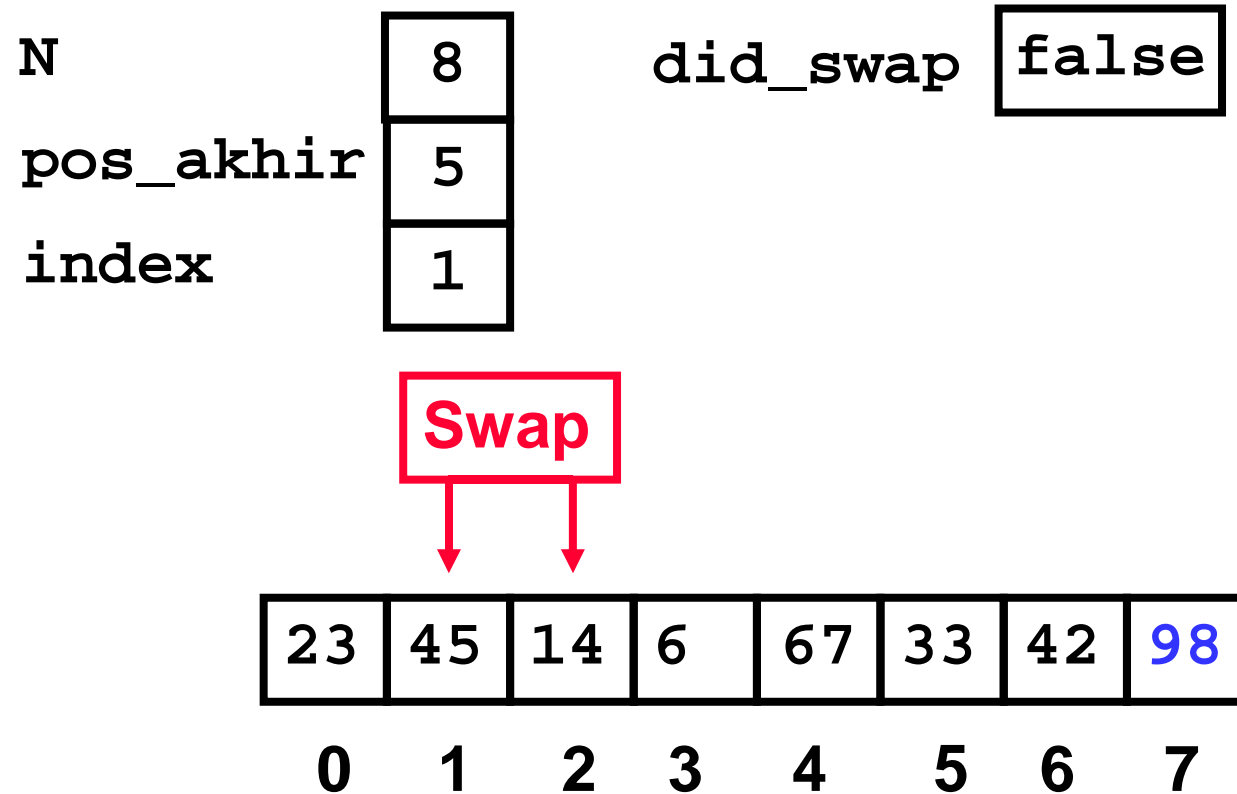
No Swap



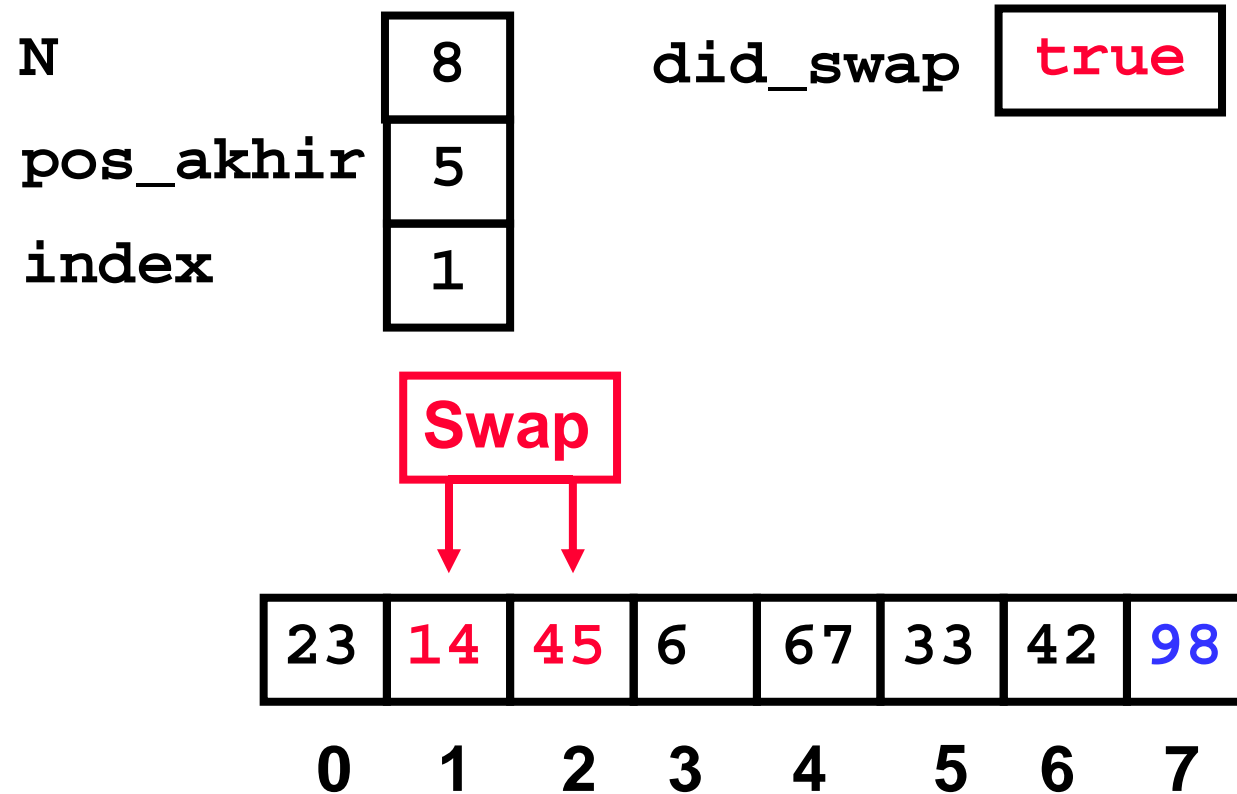
The Second “Bubble Up”



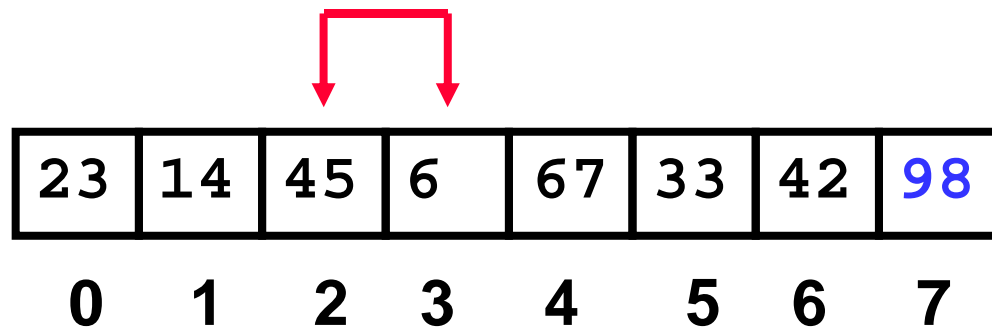
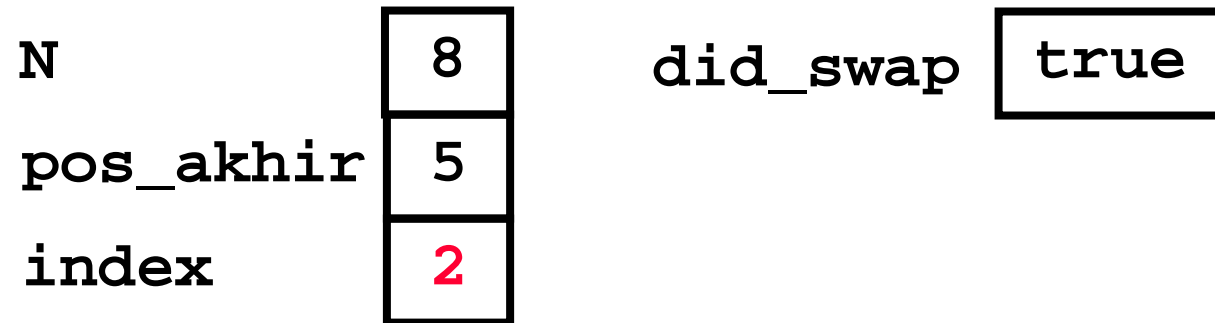
The Second "Bubble Up"



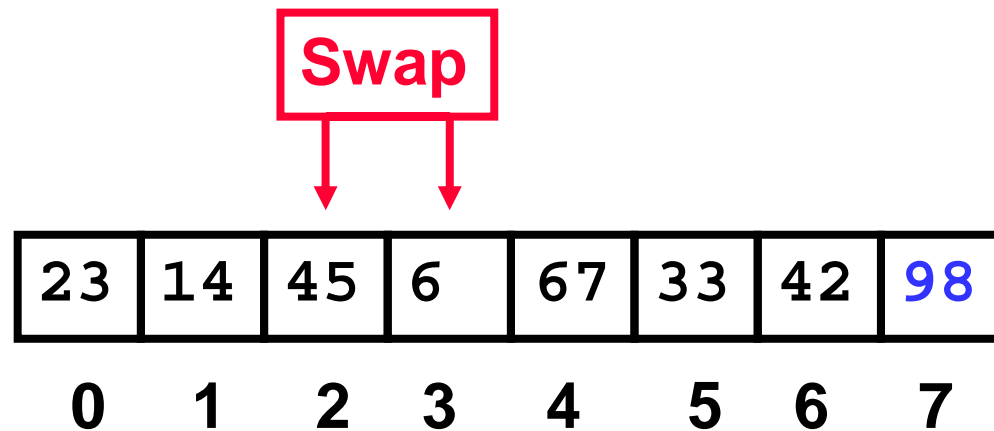
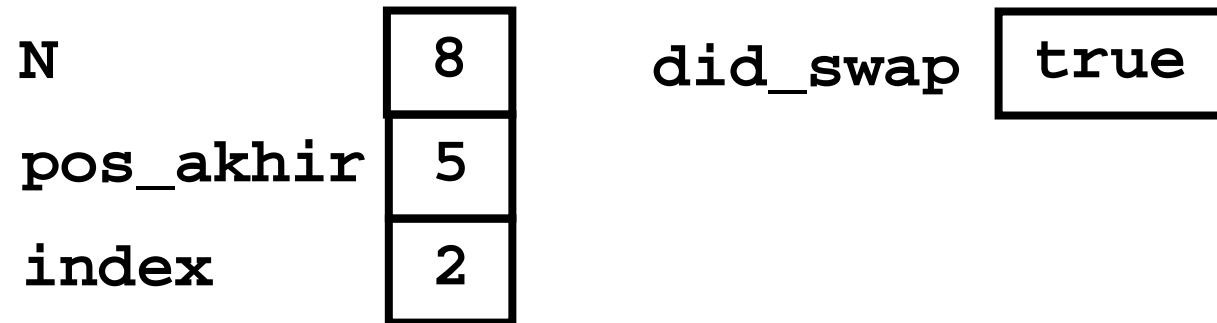
The Second “Bubble Up”



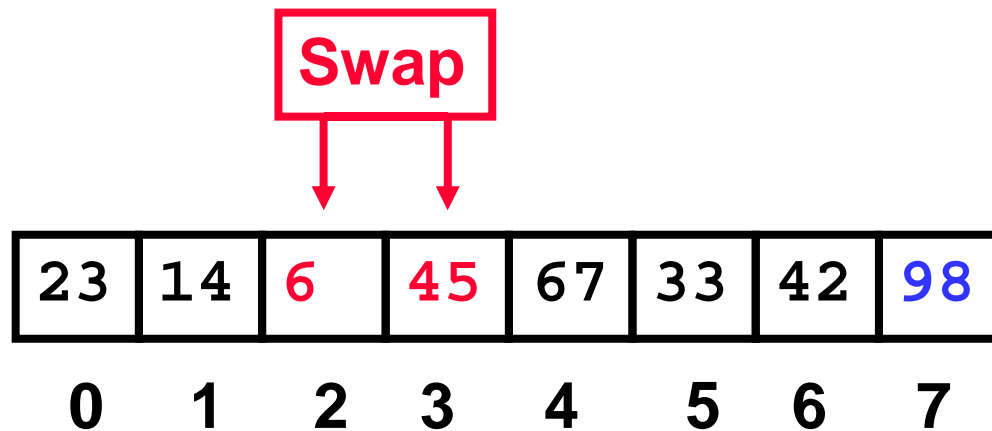
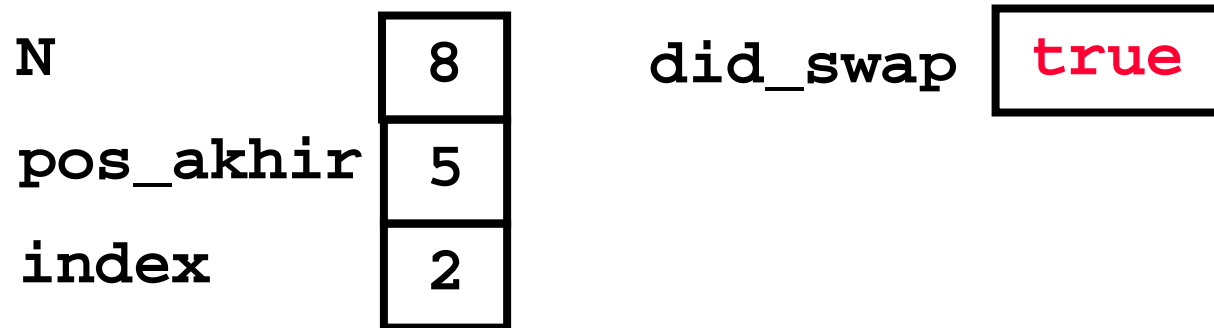
The Second “Bubble Up”



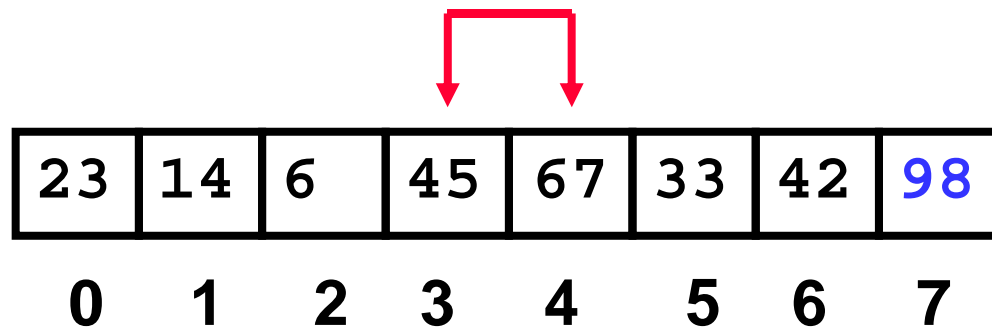
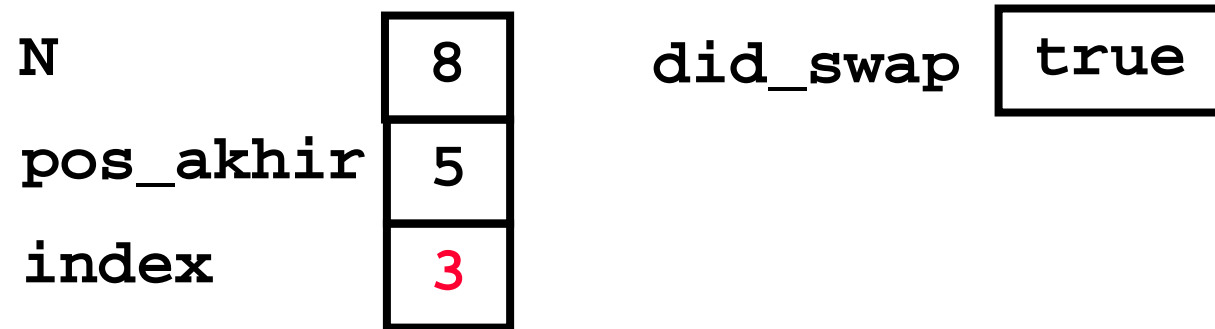
The Second "Bubble Up"



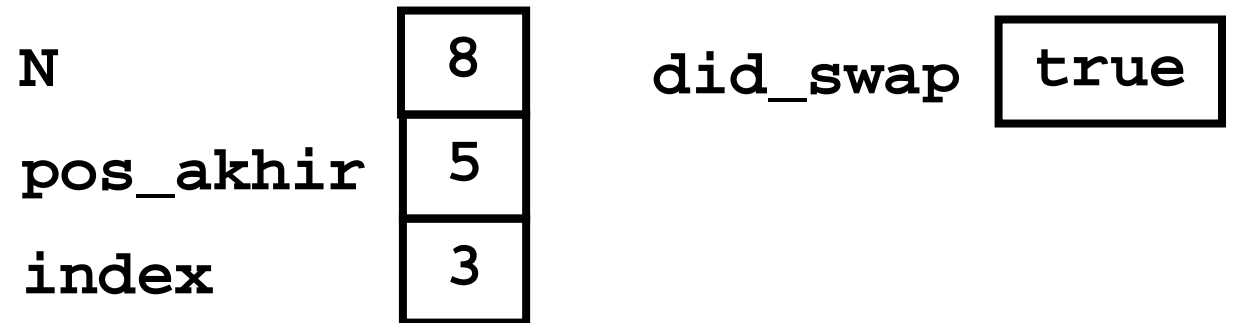
The Second "Bubble Up"



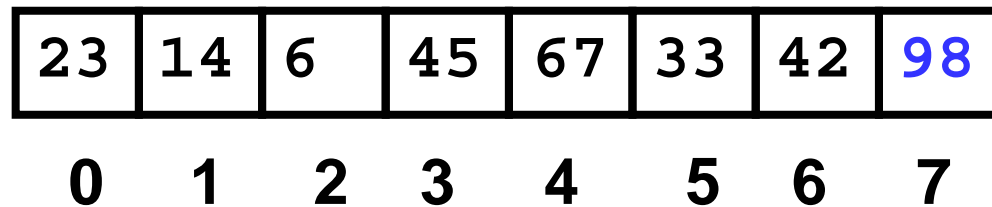
The Second "Bubble Up"



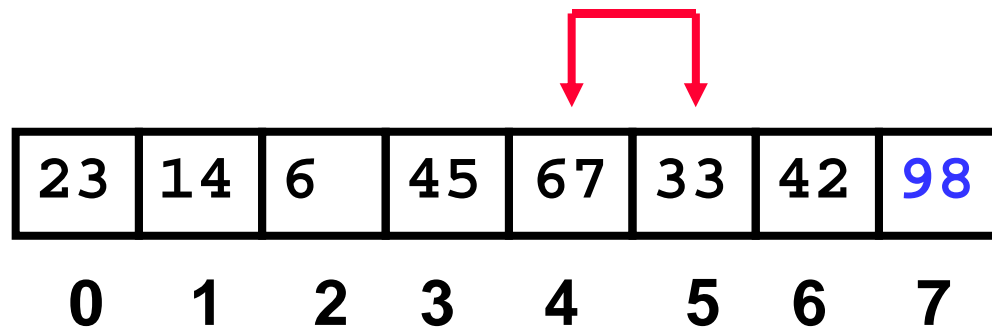
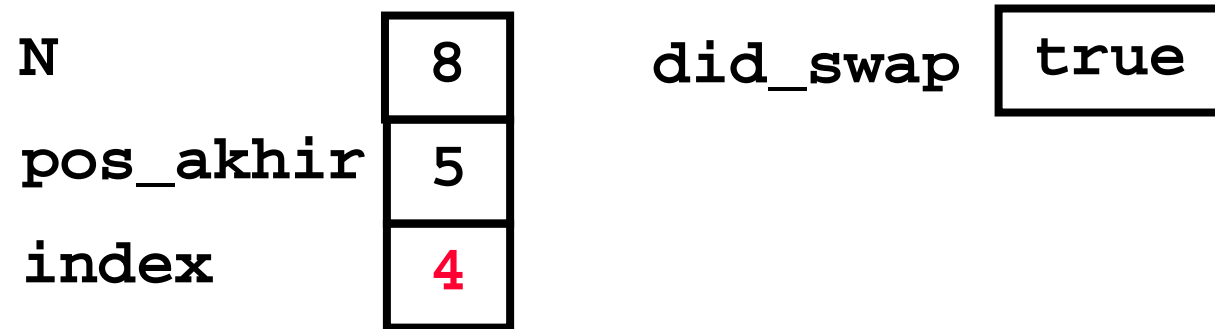
The Second “Bubble Up”



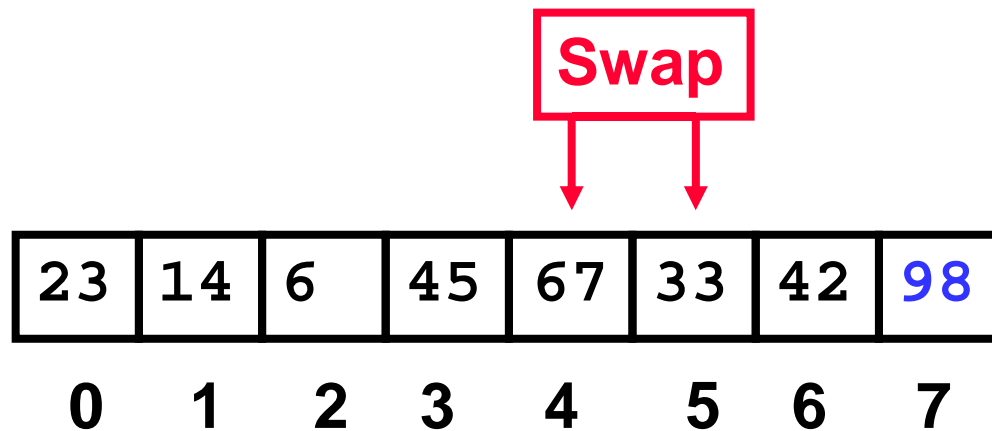
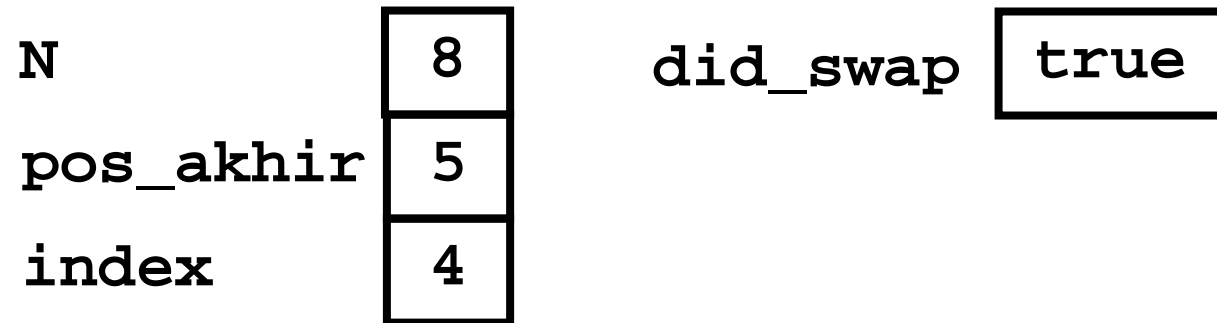
No Swap



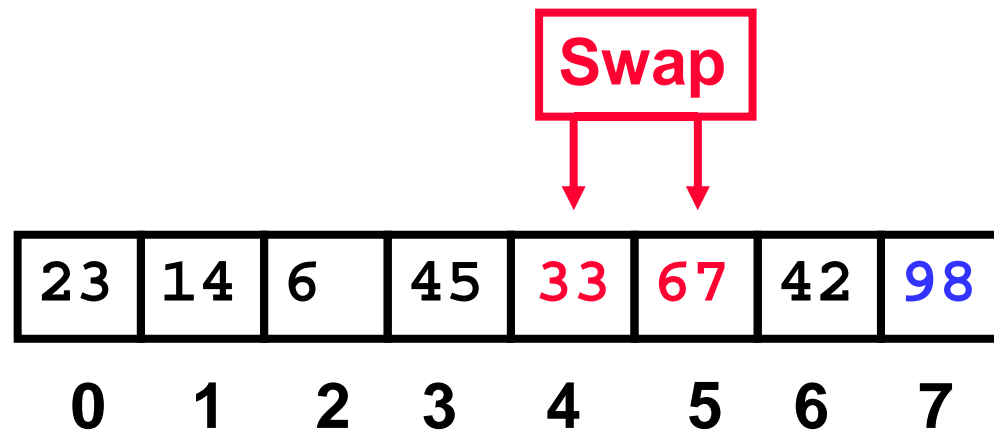
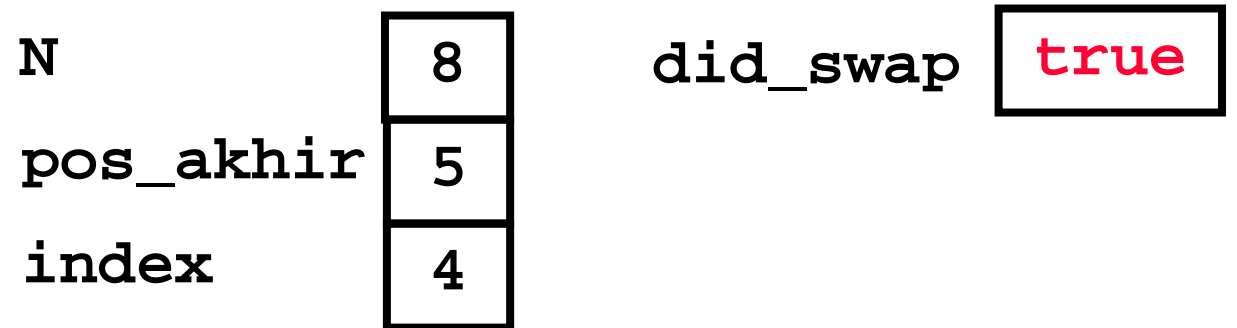
The Second "Bubble Up"



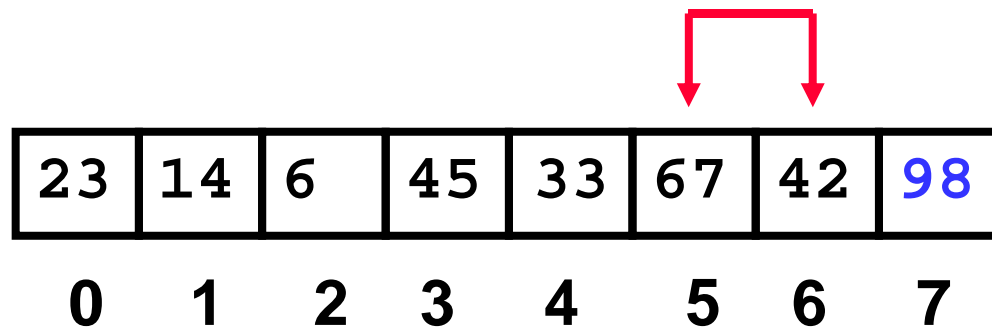
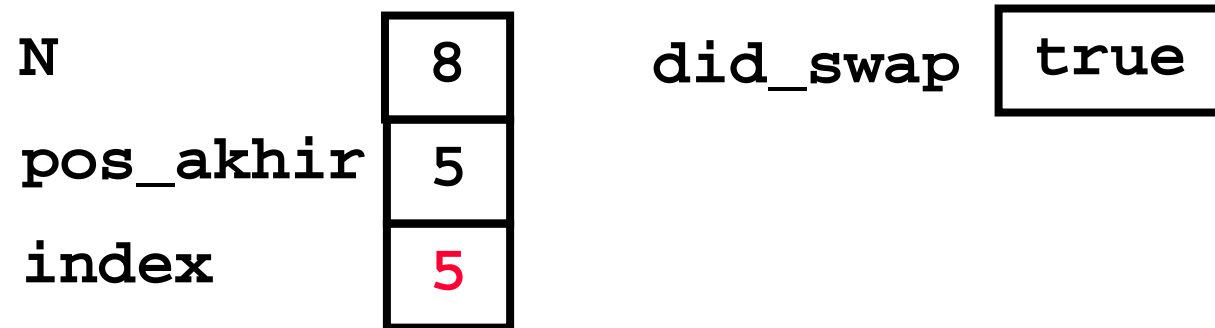
The Second "Bubble Up"



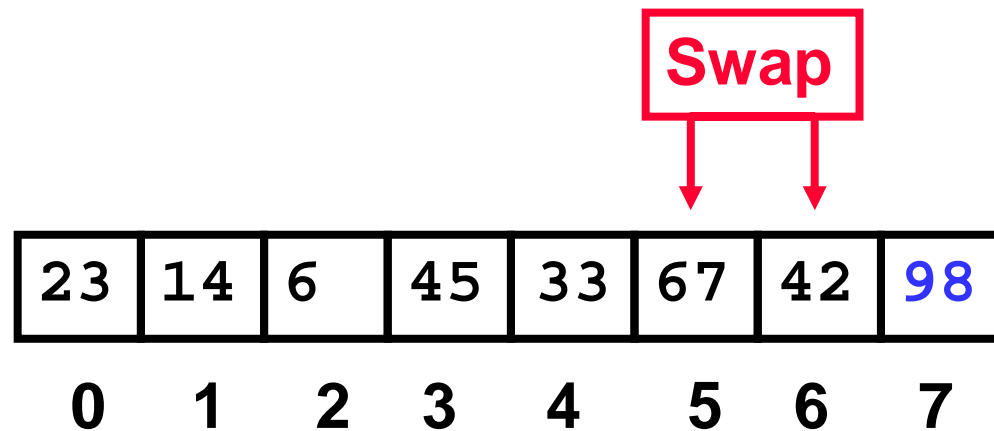
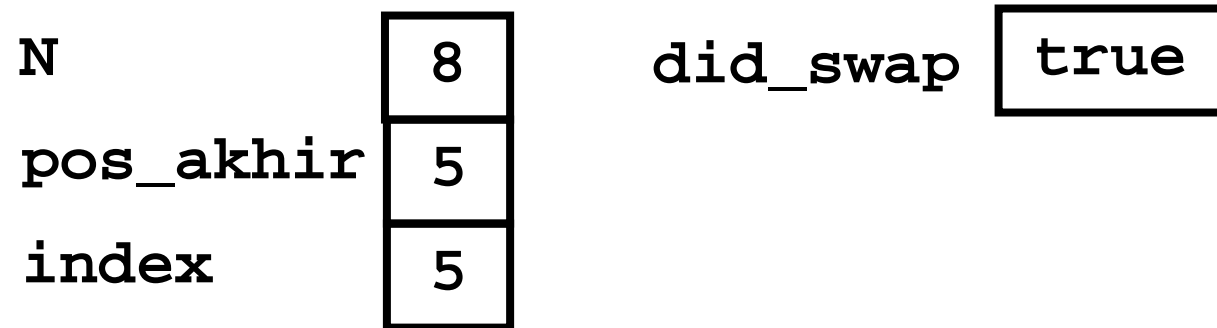
The Second “Bubble Up”



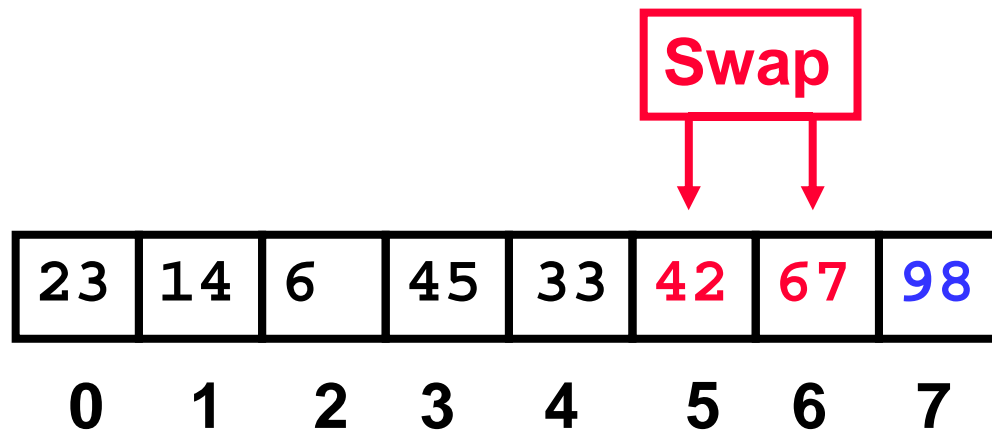
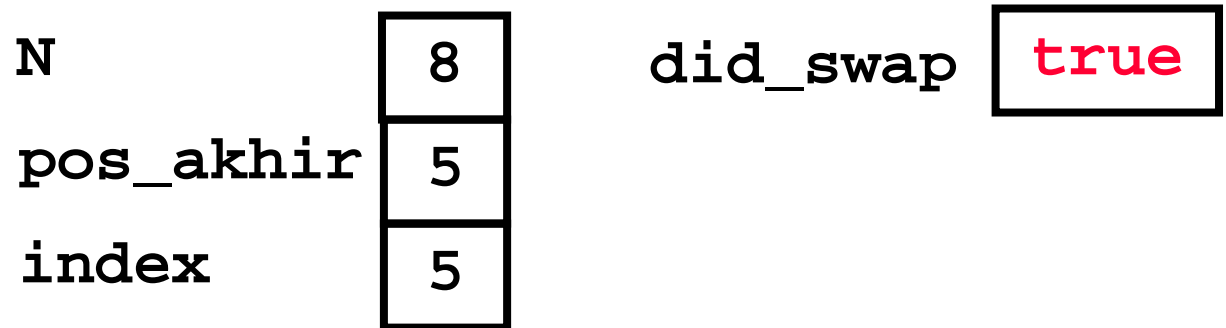
The Second "Bubble Up"



The Second “Bubble Up”



The Second “Bubble Up”



After Second Pass of Outer Loop

N

8

 did_swap

true

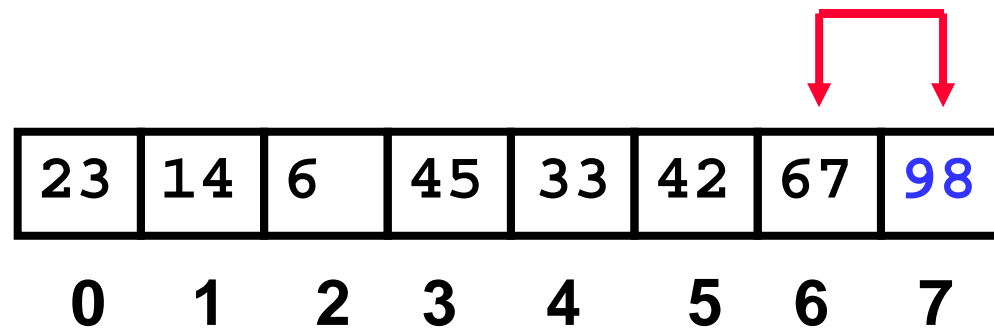
pos_akhir

5

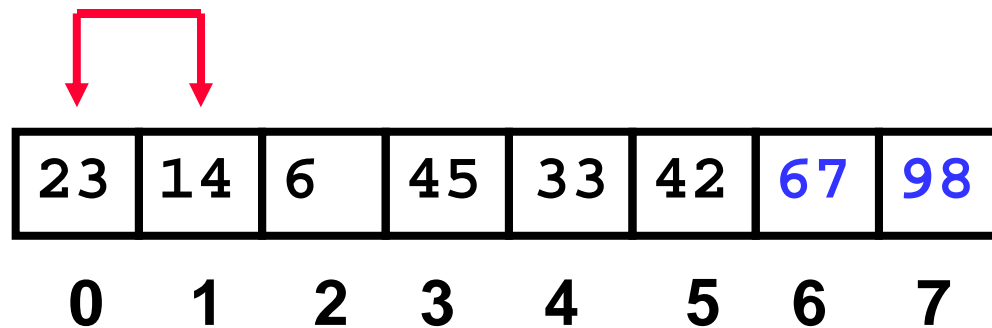
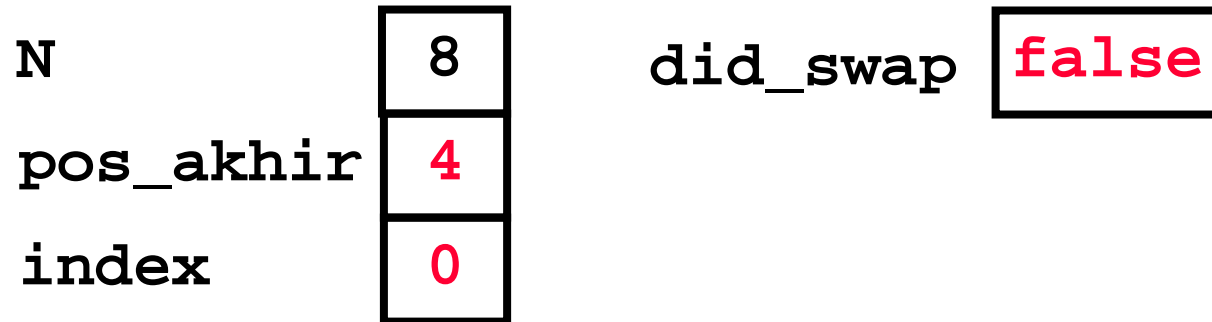
index

6

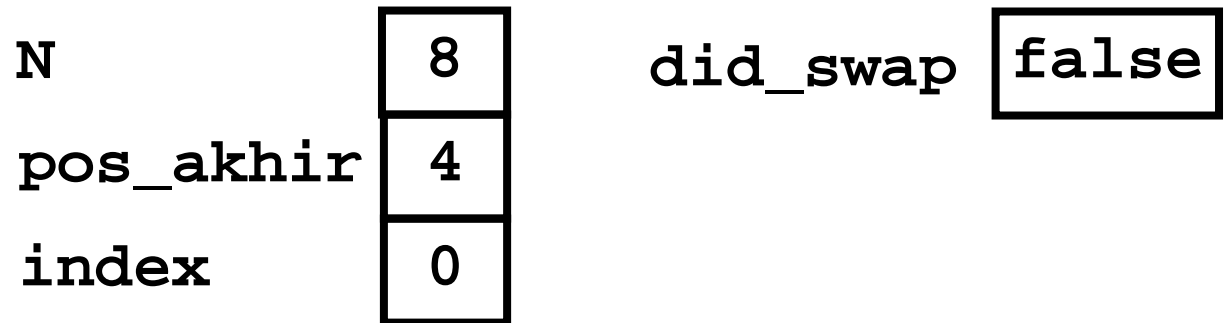
Finished second "Bubble Up"



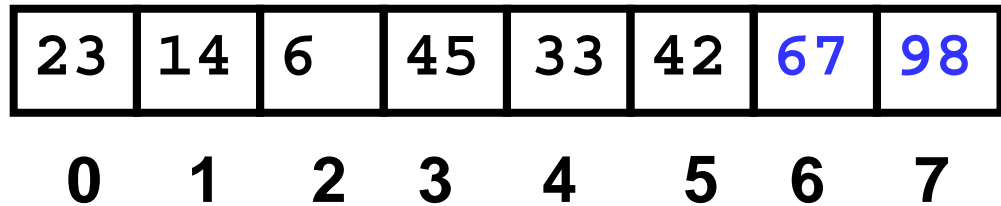
The Third "Bubble Up"



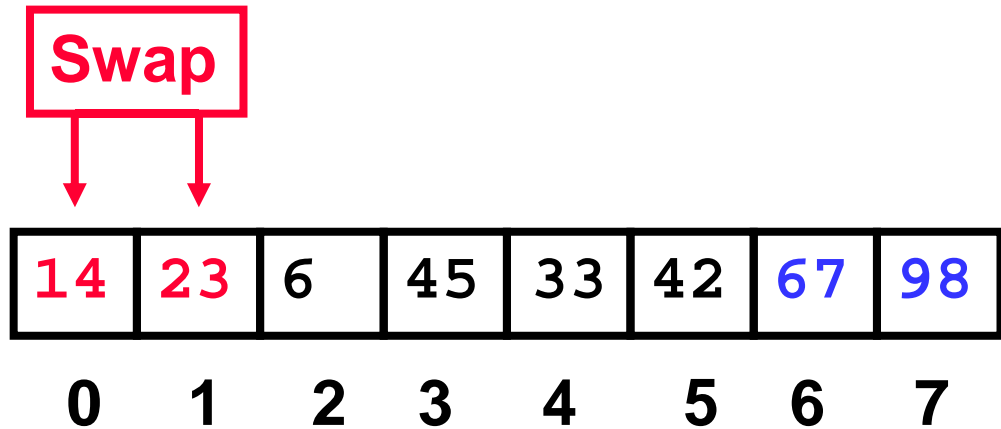
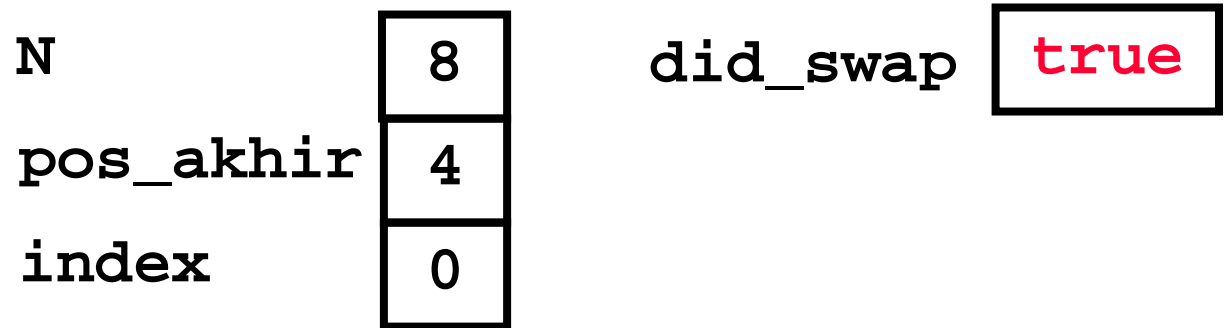
The Third "Bubble Up"



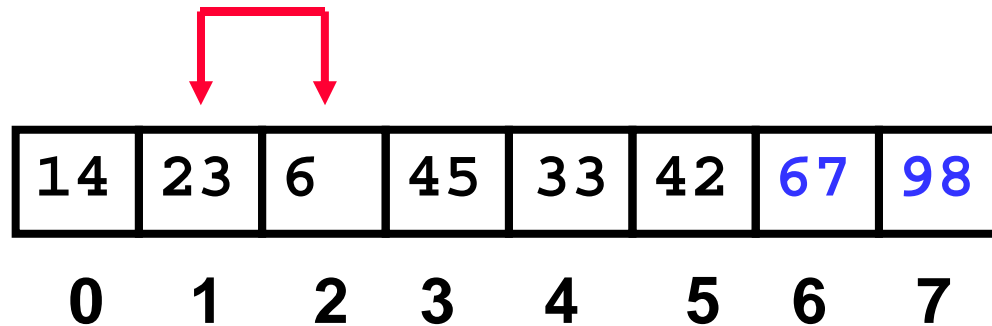
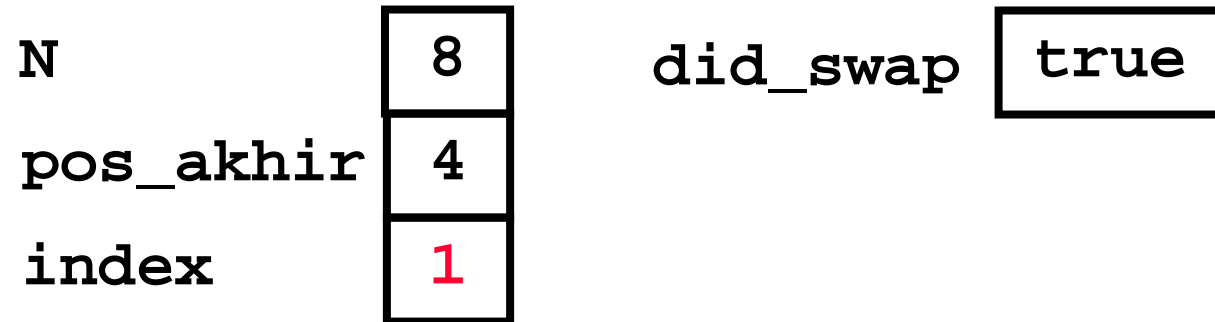
Swap



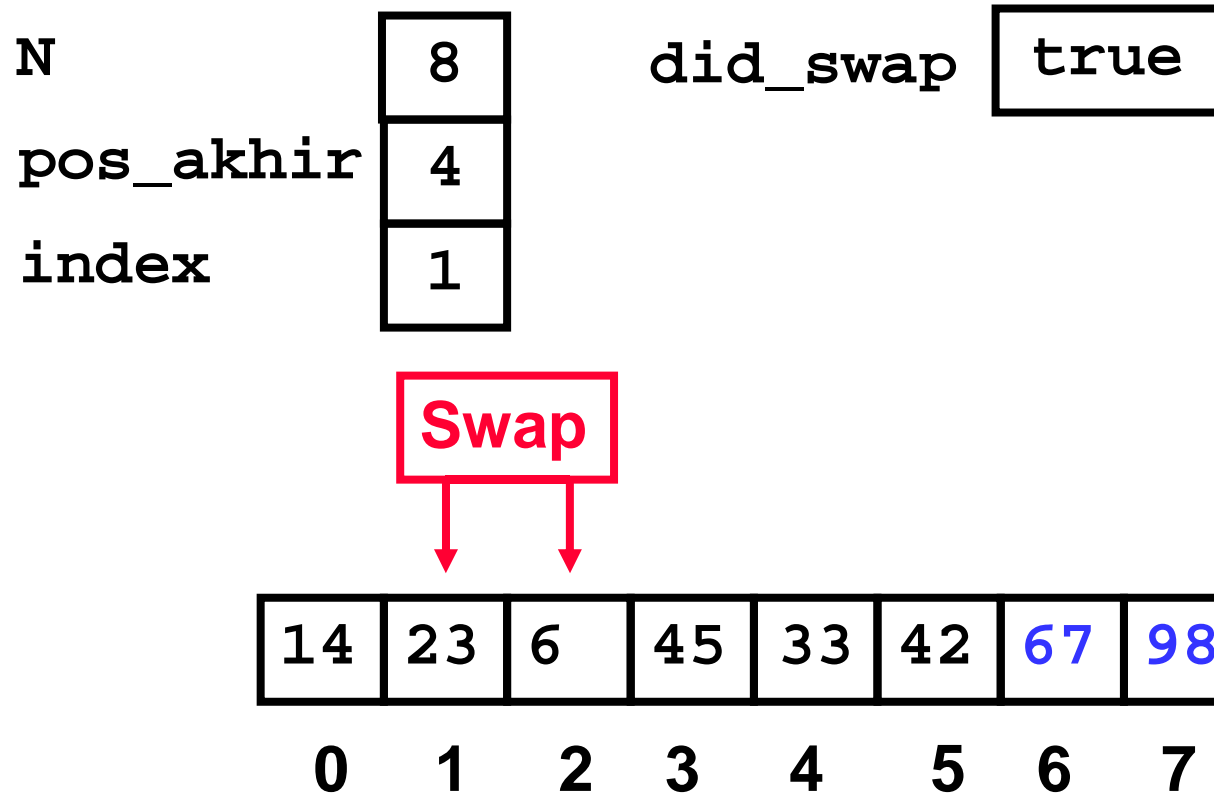
The Third "Bubble Up"



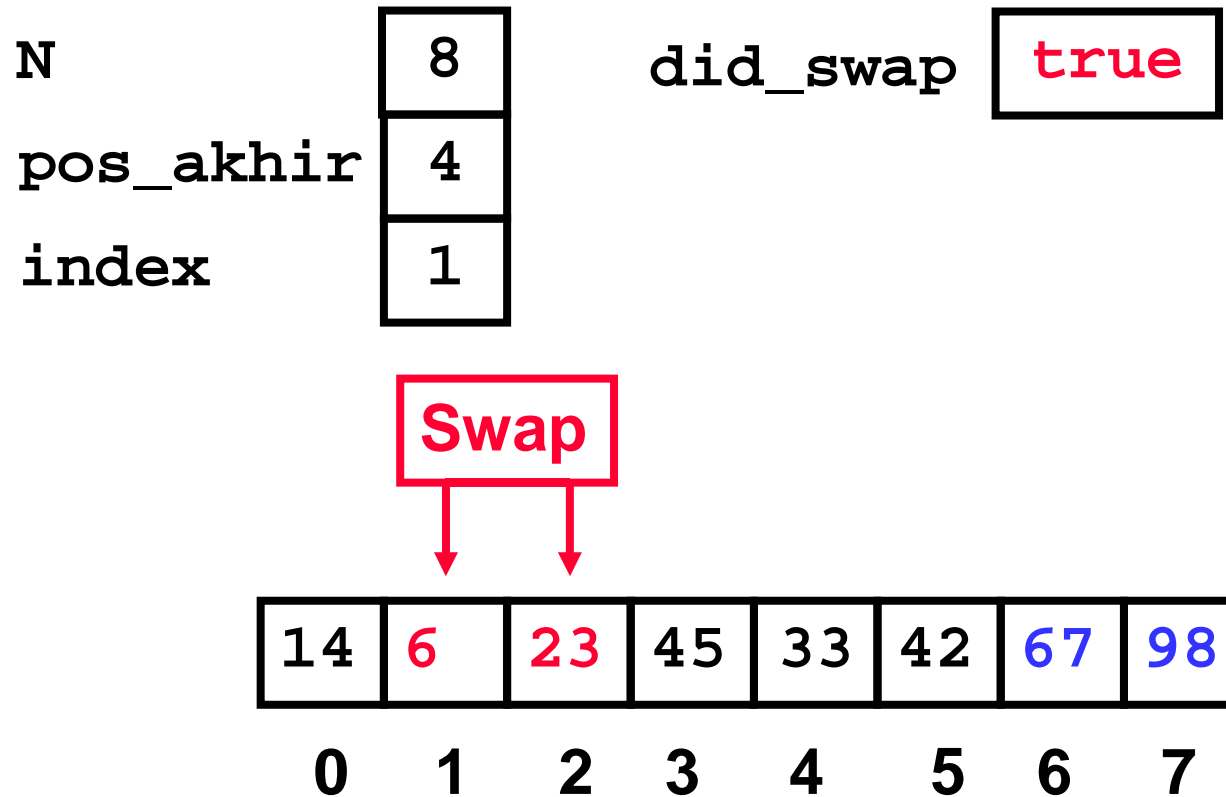
The Third "Bubble Up"



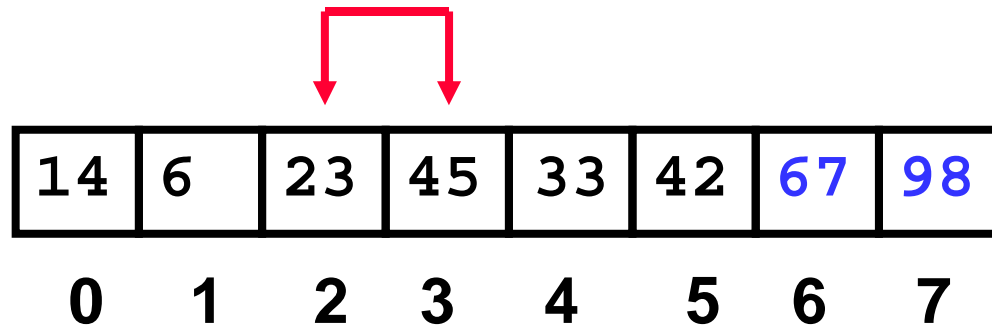
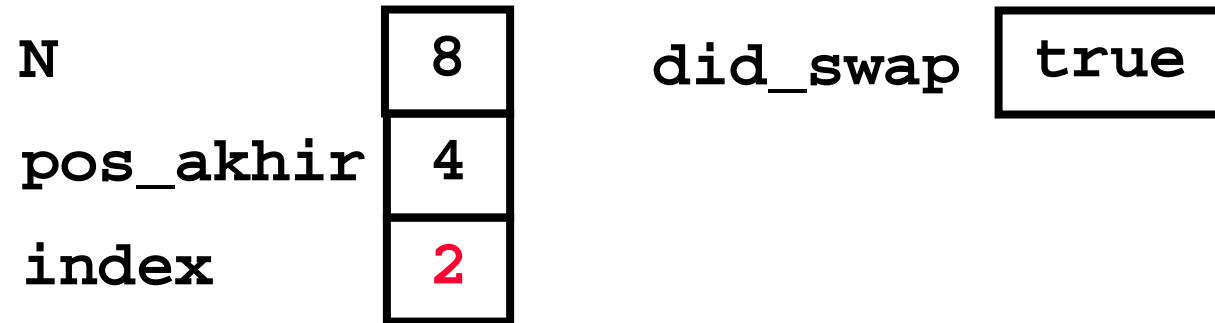
The Third "Bubble Up"



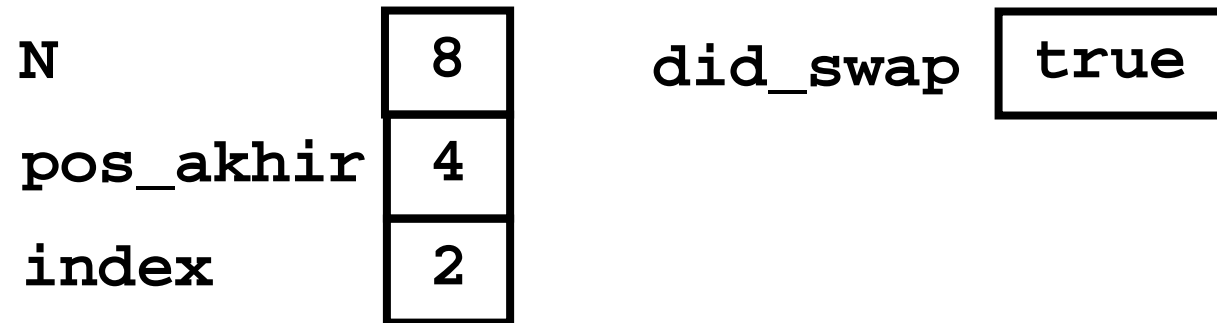
The Third "Bubble Up"



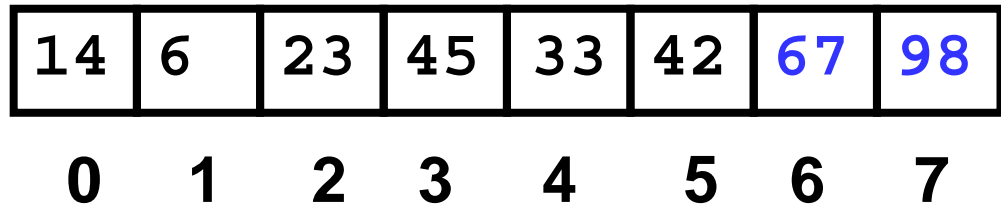
The Third "Bubble Up"



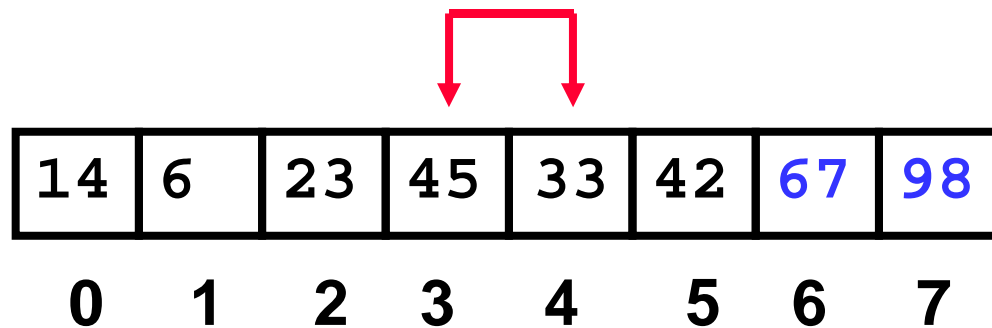
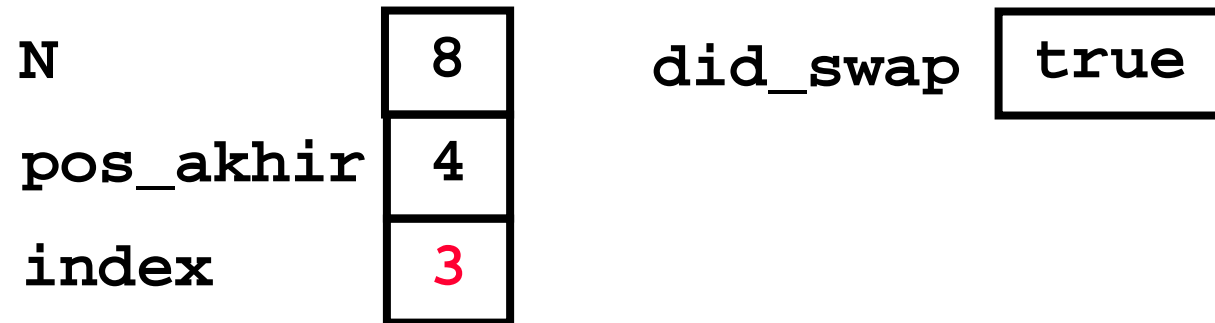
The Third "Bubble Up"



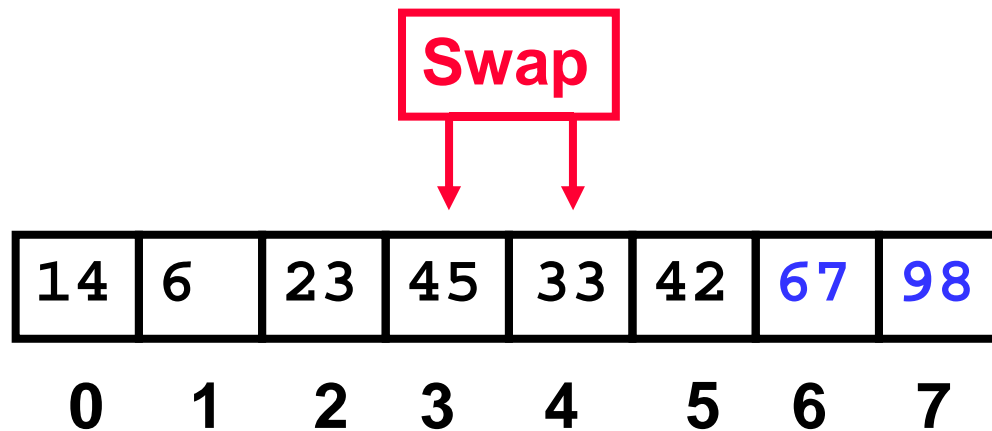
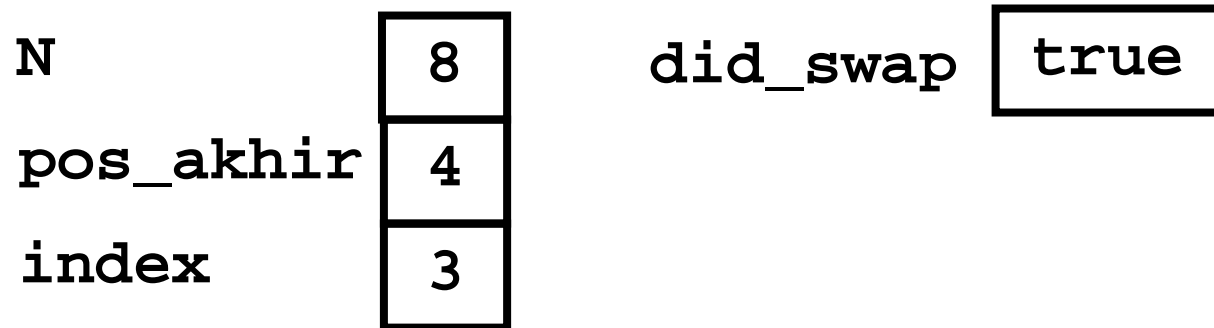
No Swap



The Third "Bubble Up"



The Third "Bubble Up"



The Third "Bubble Up"

N

8

 did_swap

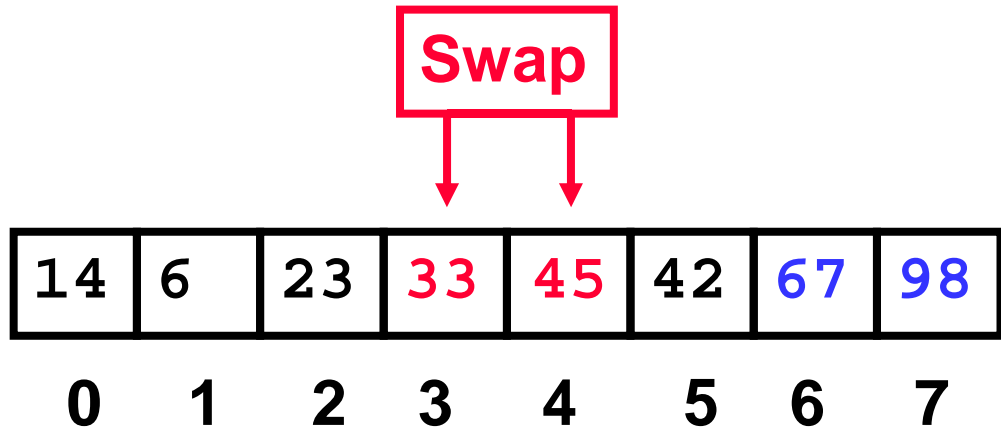
true

pos_akhir

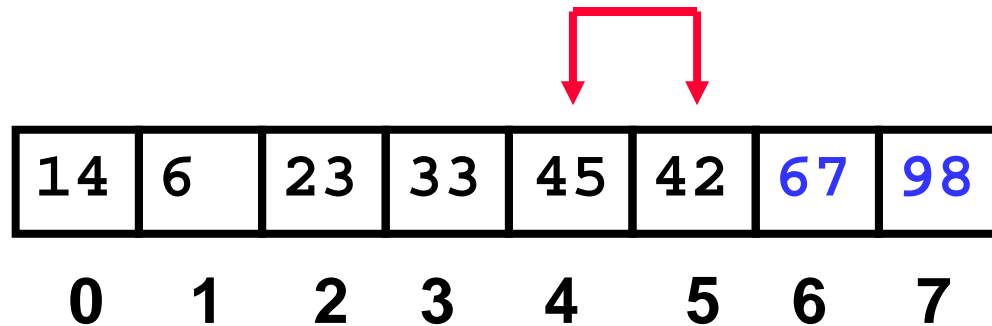
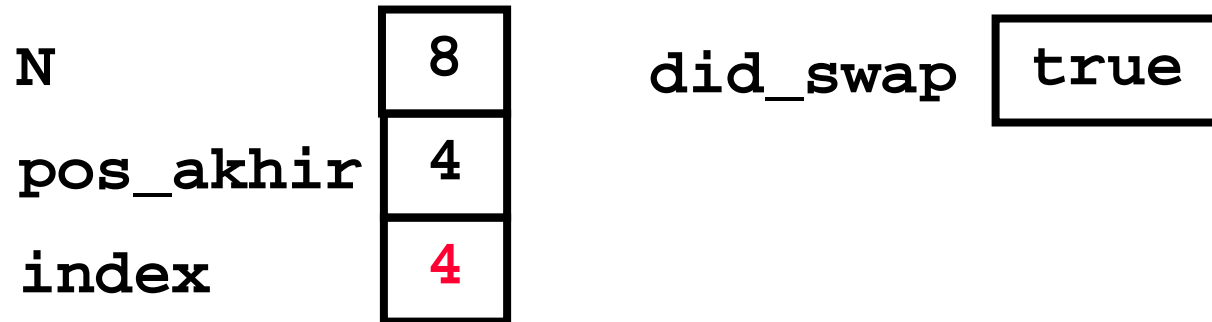
4

index

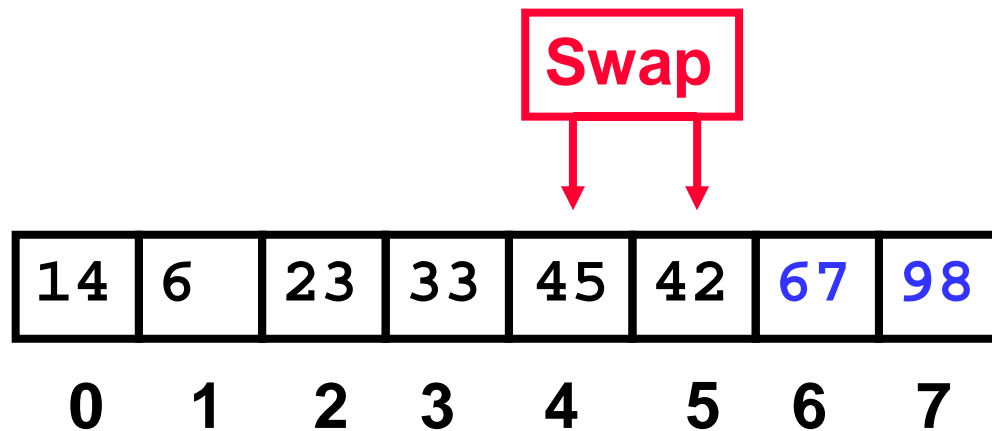
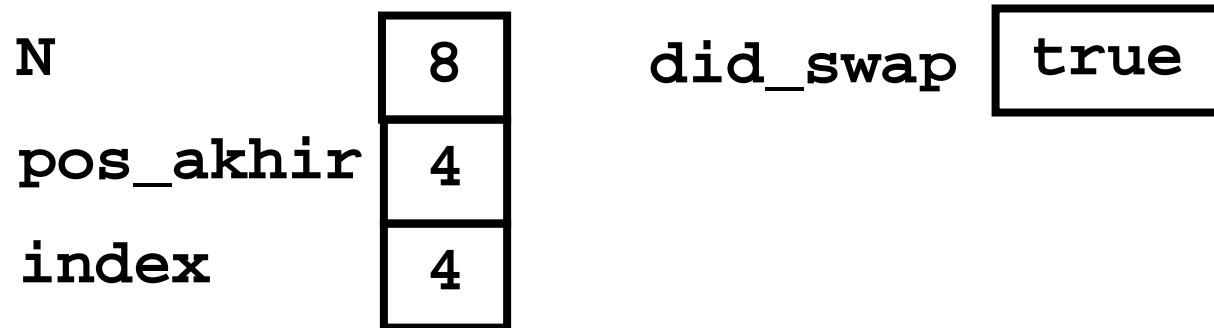
3



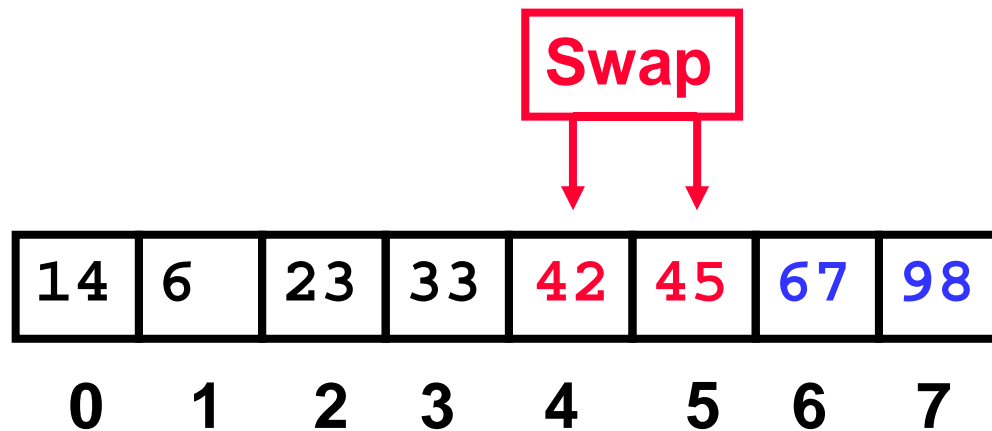
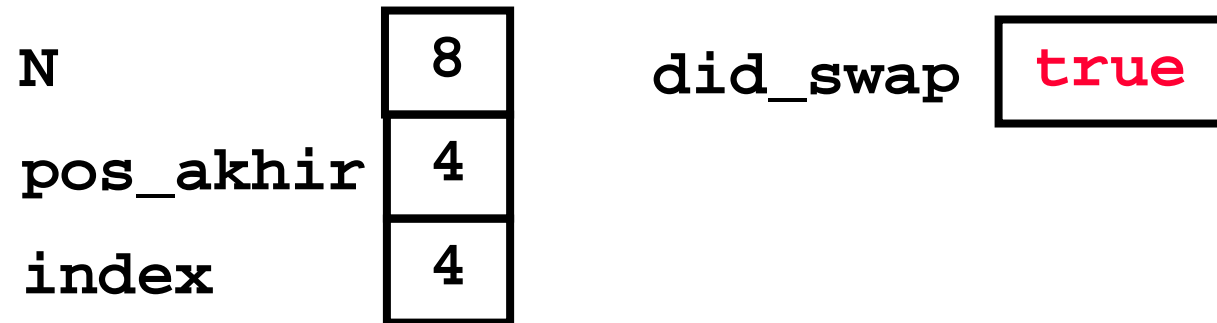
The Third "Bubble Up"



The Third "Bubble Up"



The Third "Bubble Up"



After Third Pass of Outer Loop

N

8

 did_swap

true

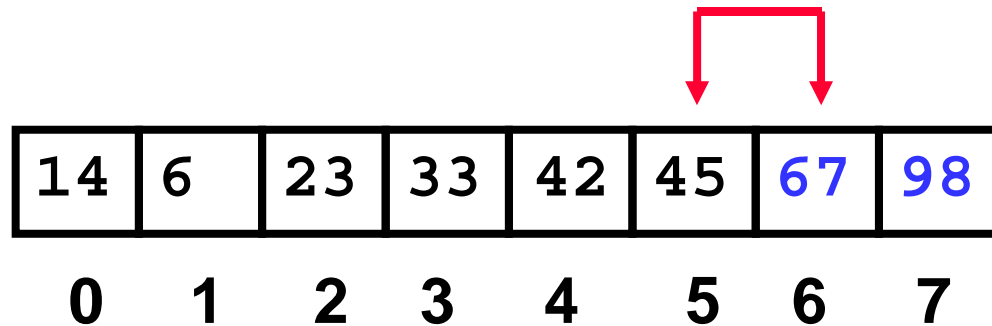
pos_akhir

4

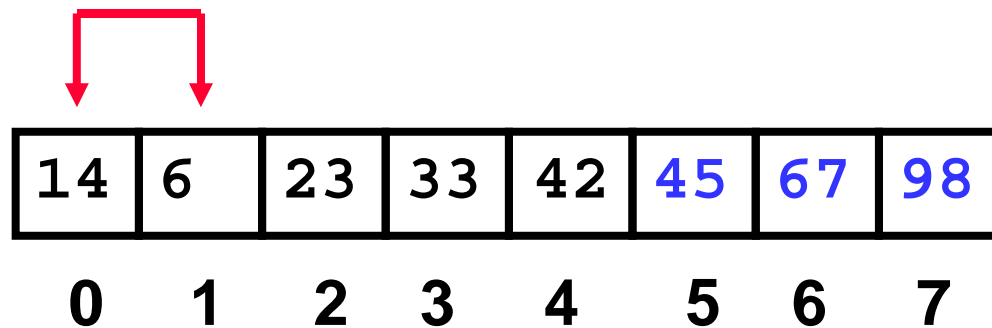
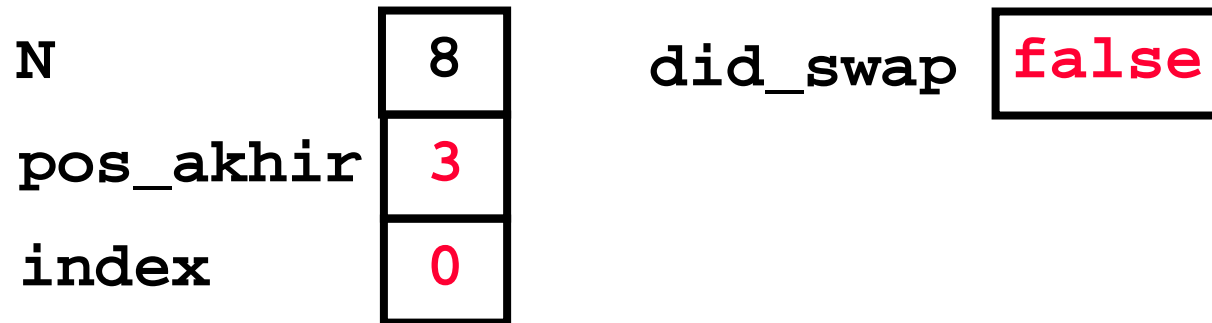
index

5

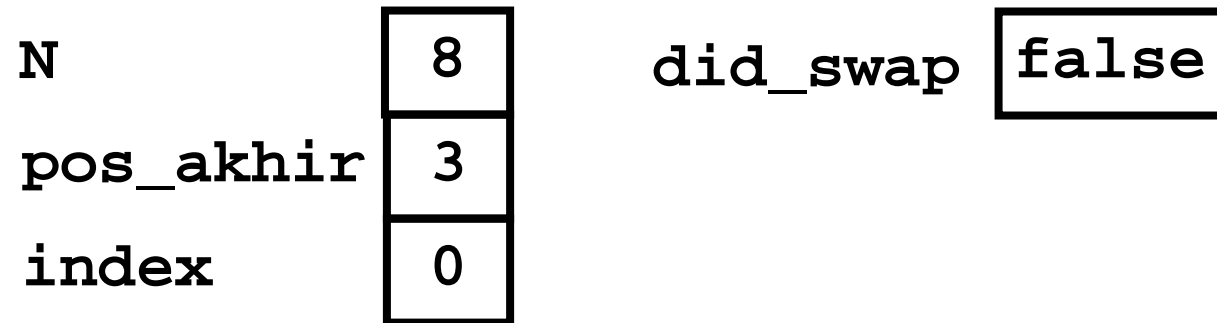
Finished third "Bubble Up"



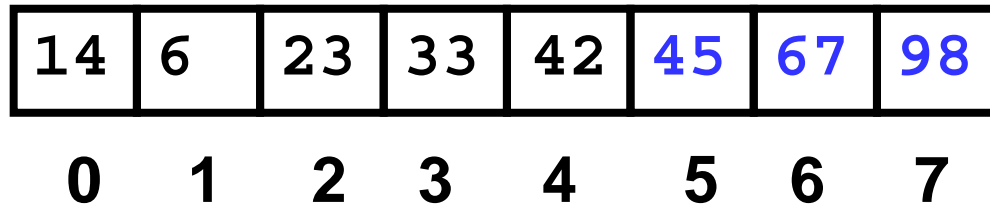
The Fourth "Bubble Up"



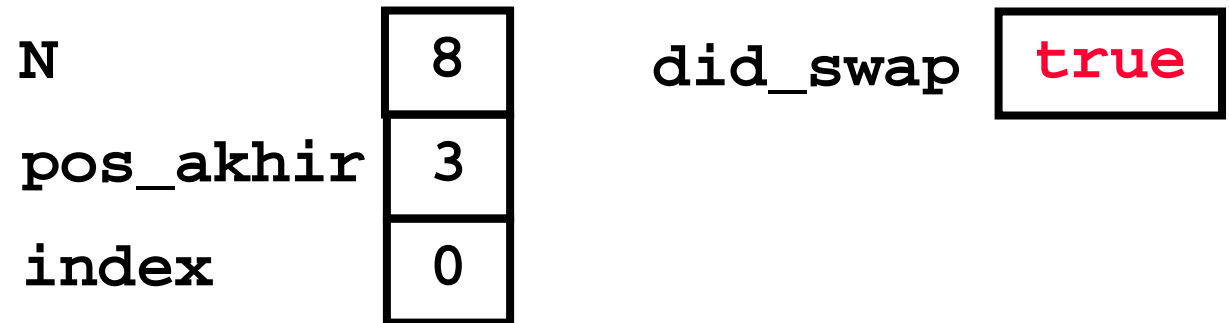
The Fourth "Bubble Up"



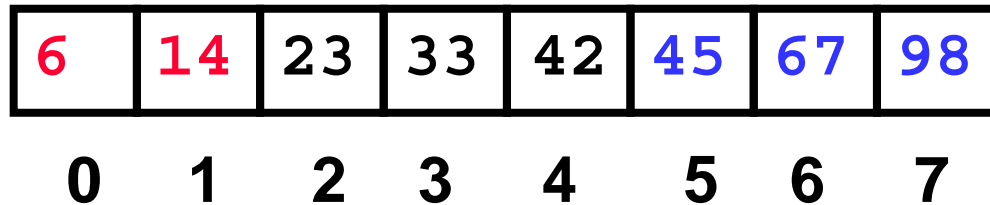
Swap



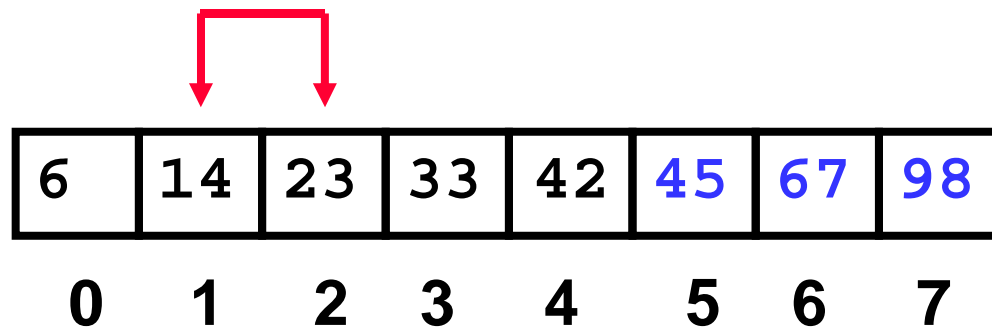
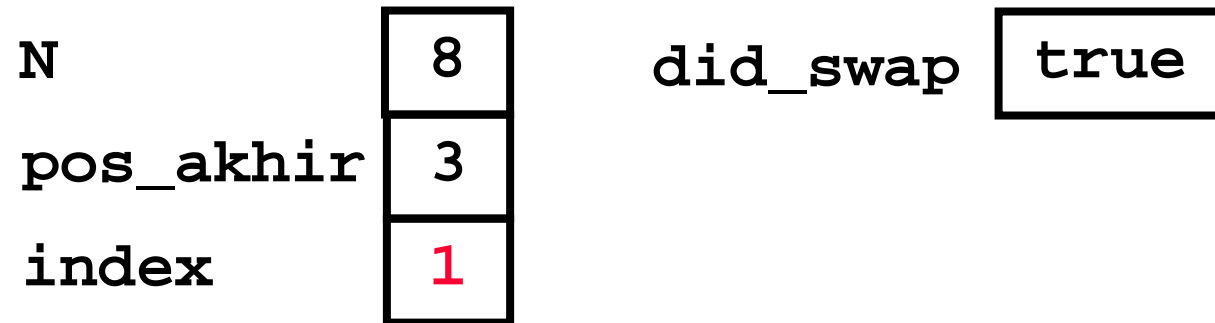
The Fourth "Bubble Up"



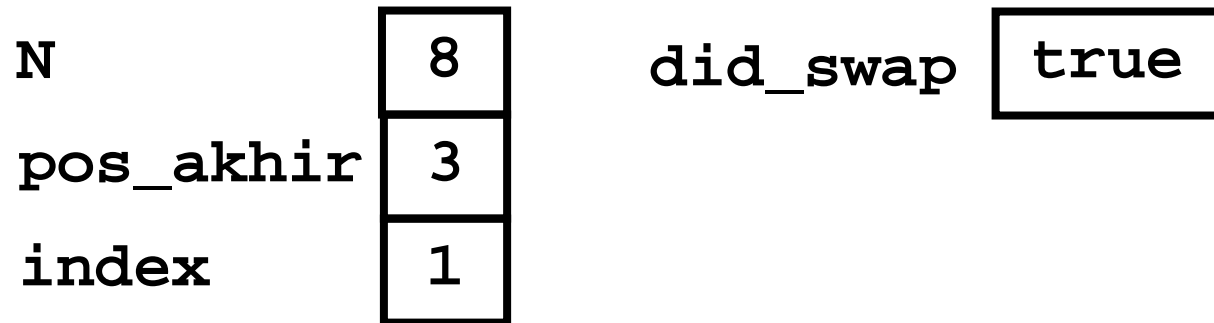
Swap



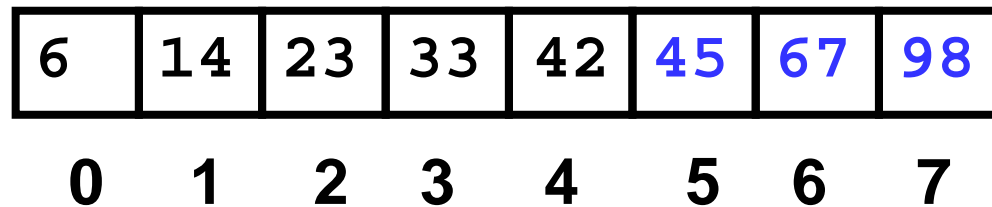
The Fourth "Bubble Up"



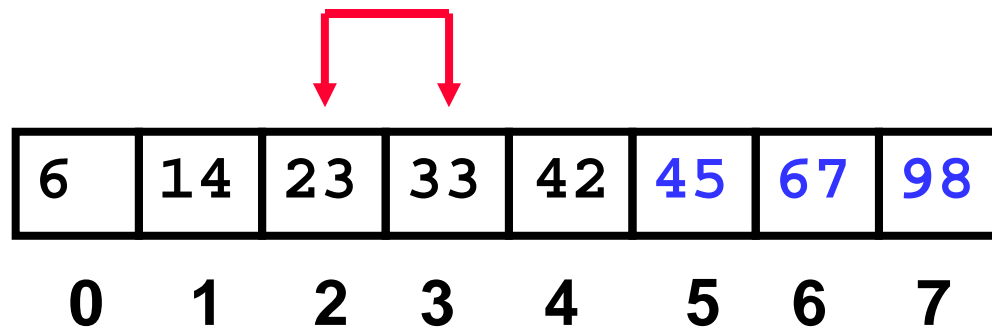
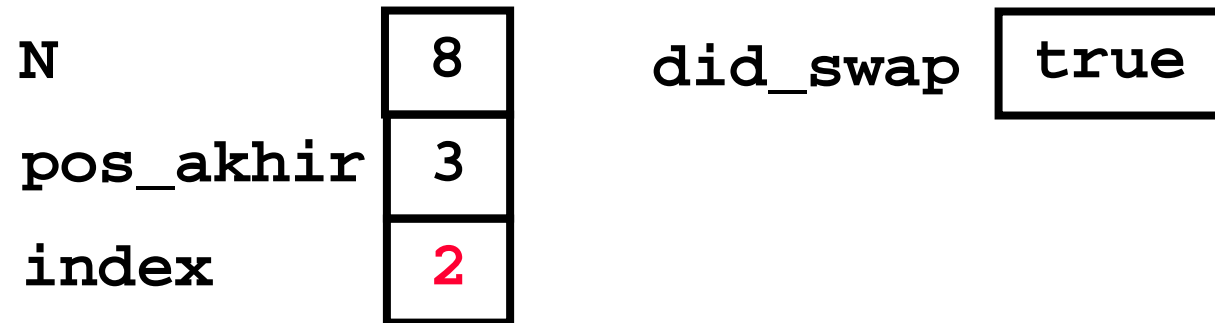
The Fourth "Bubble Up"



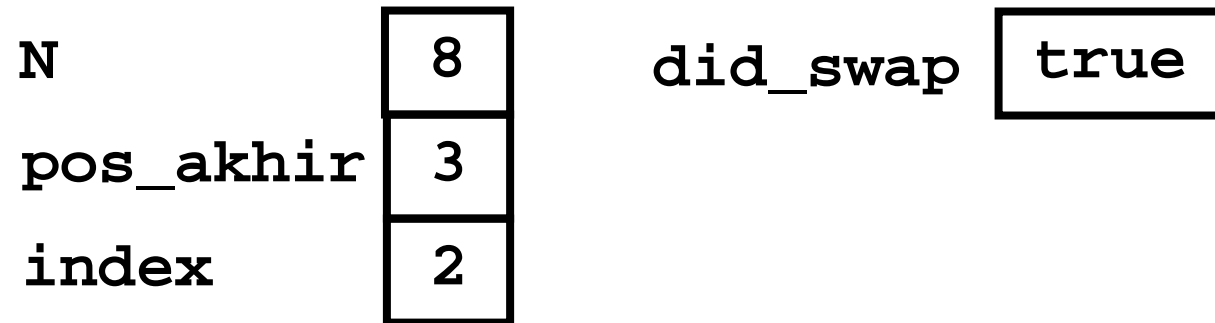
No Swap



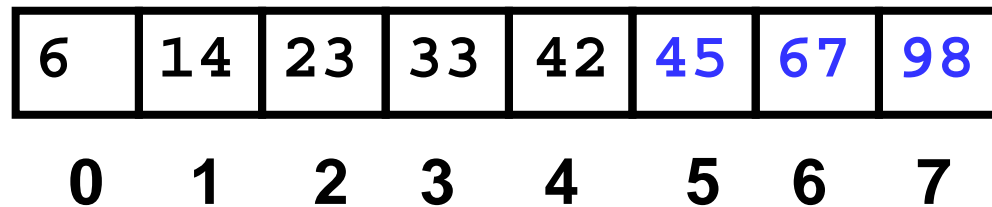
The Fourth "Bubble Up"



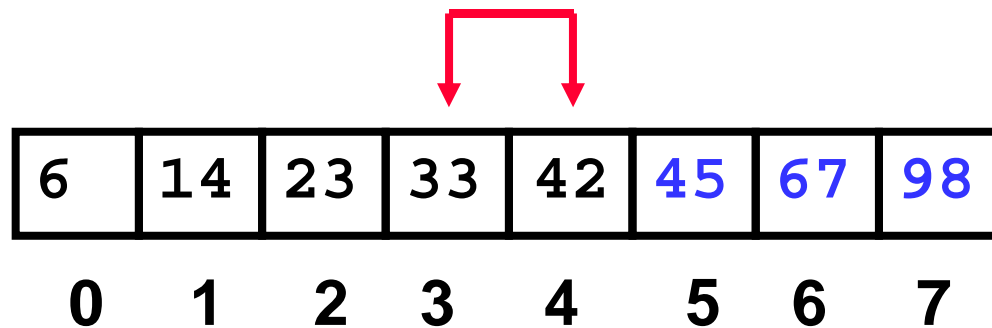
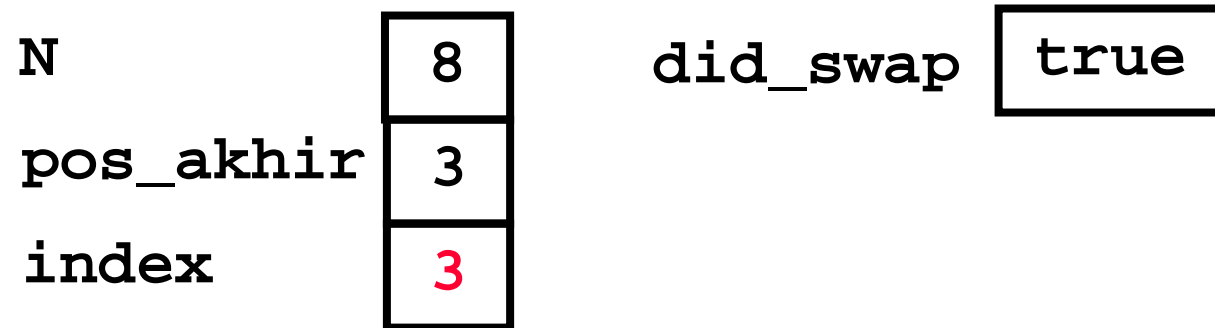
The Fourth "Bubble Up"



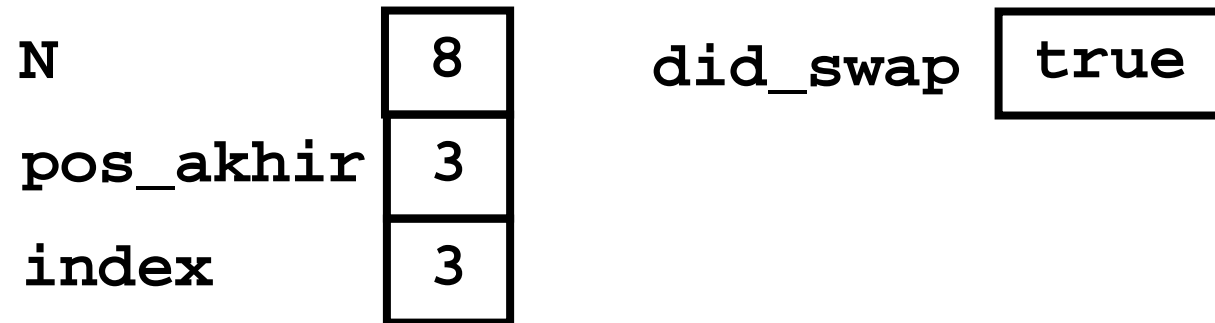
No Swap



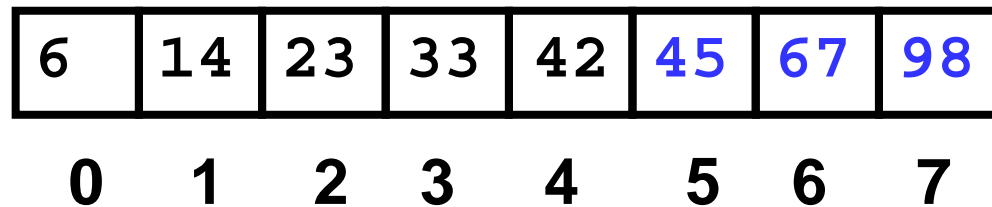
The Fourth "Bubble Up"



The Fourth "Bubble Up"



No Swap



After Fourth Pass of Outer Loop

N

8

 did_swap

true

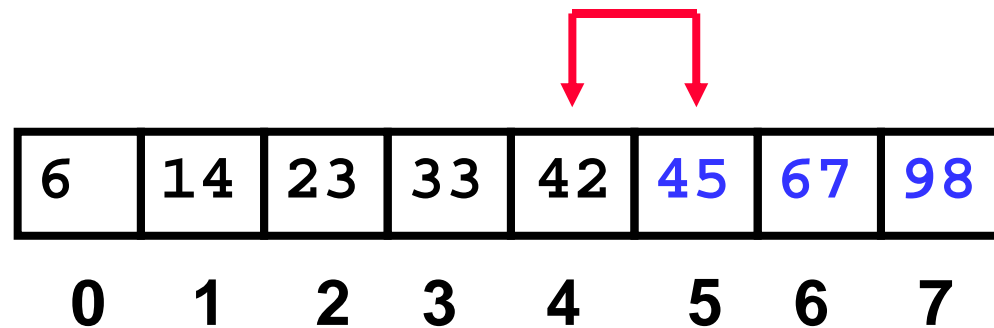
pos_akhir

3

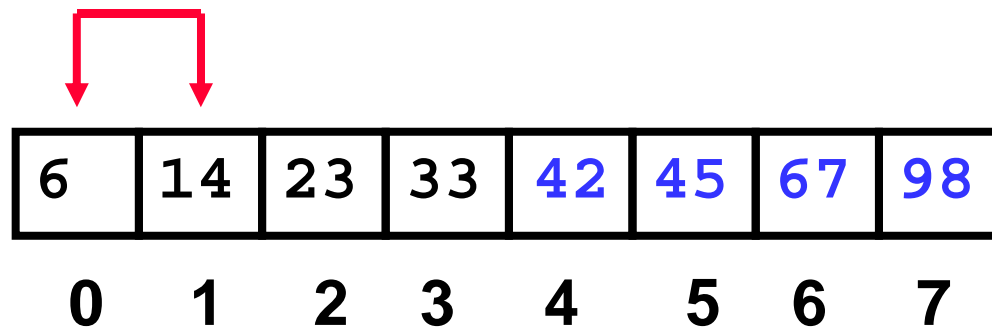
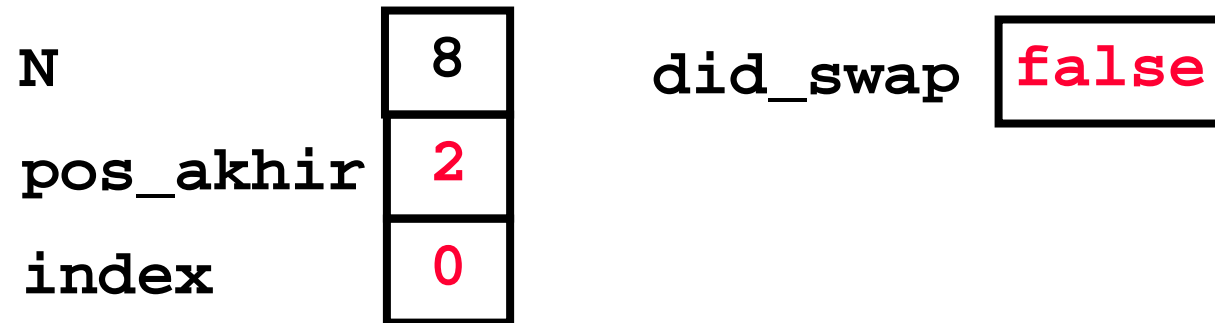
index

4

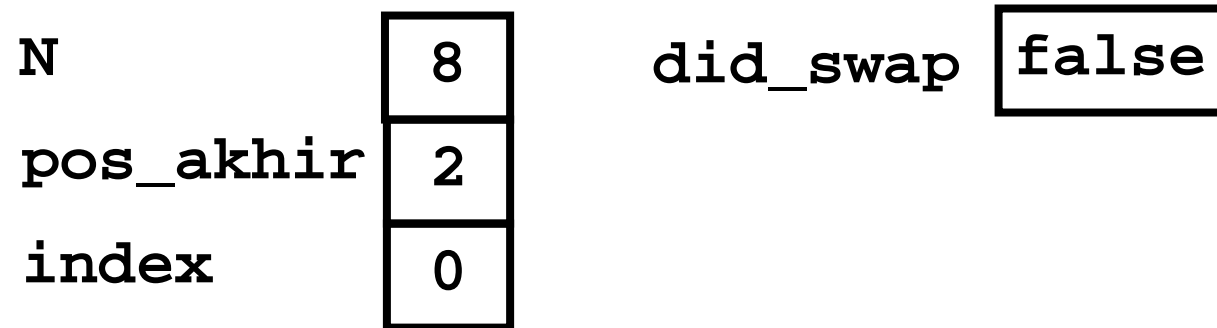
Finished fourth "Bubble Up"



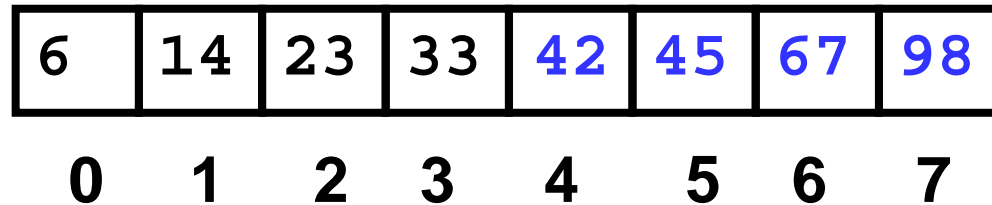
The Fifth "Bubble Up"



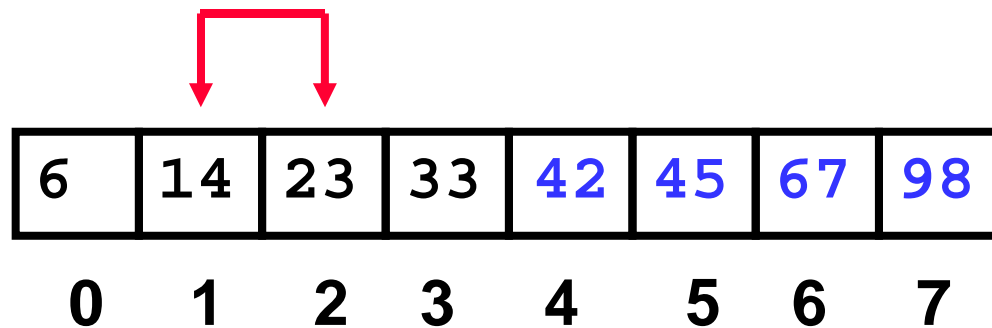
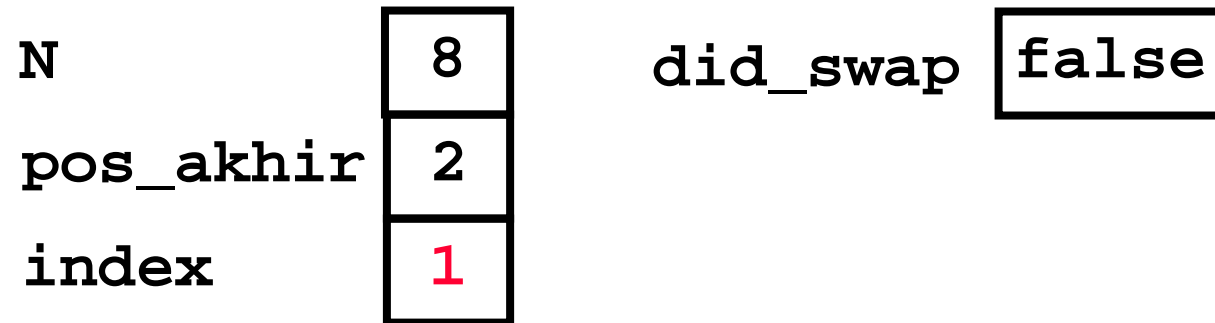
The Fifth "Bubble Up"



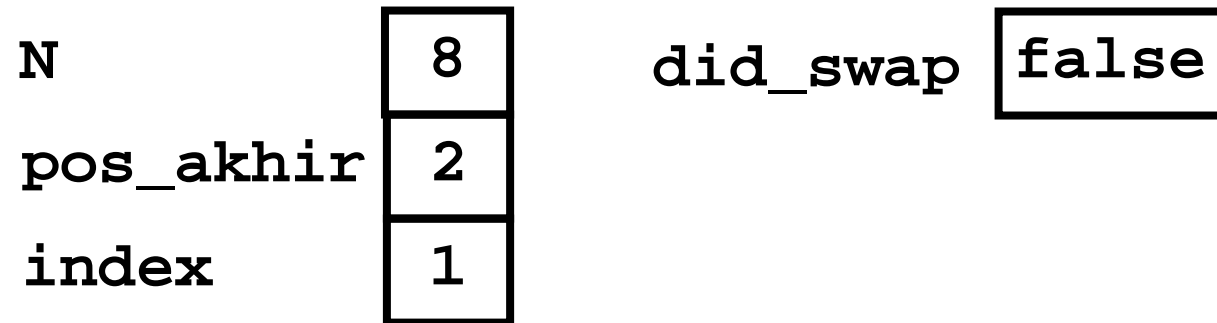
No Swap



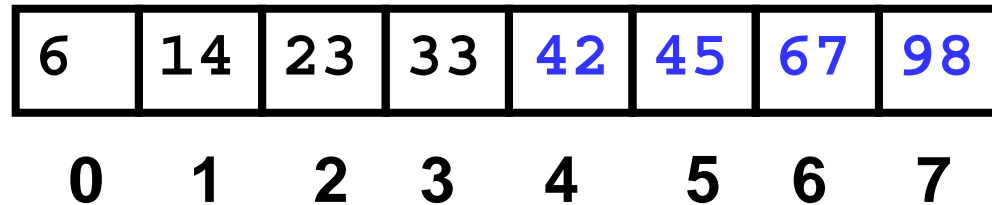
The Fifth "Bubble Up"



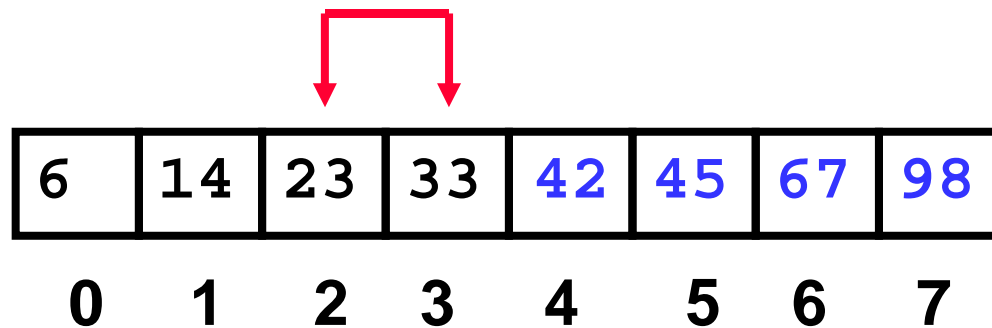
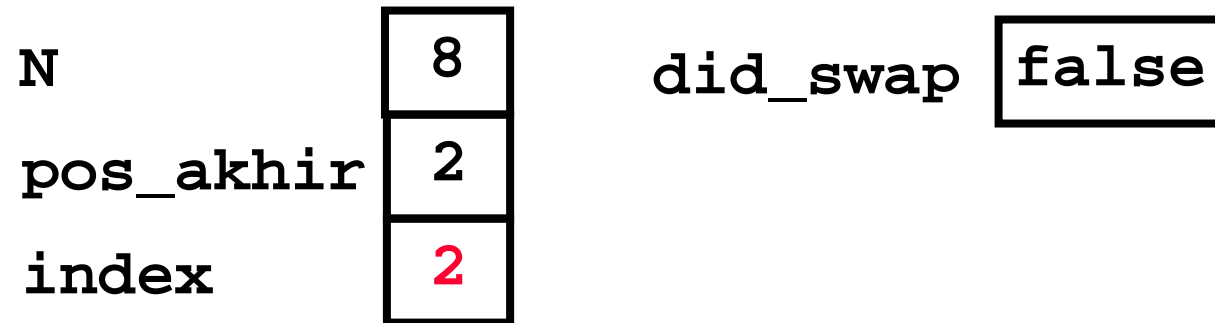
The Fifth "Bubble Up"



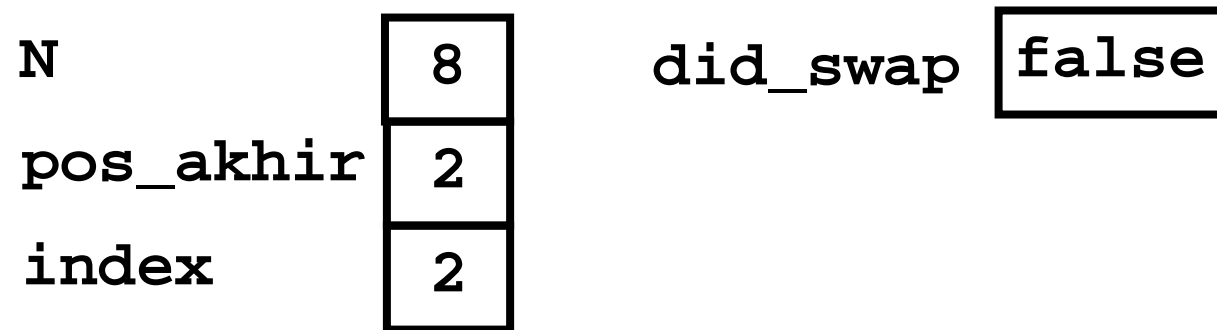
No Swap



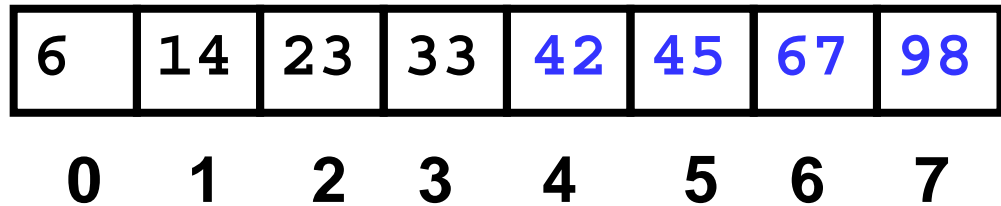
The Fifth "Bubble Up"



The Fifth "Bubble Up"



No Swap



After Fifth Pass of Outer Loop

N

8

 did_swap

false

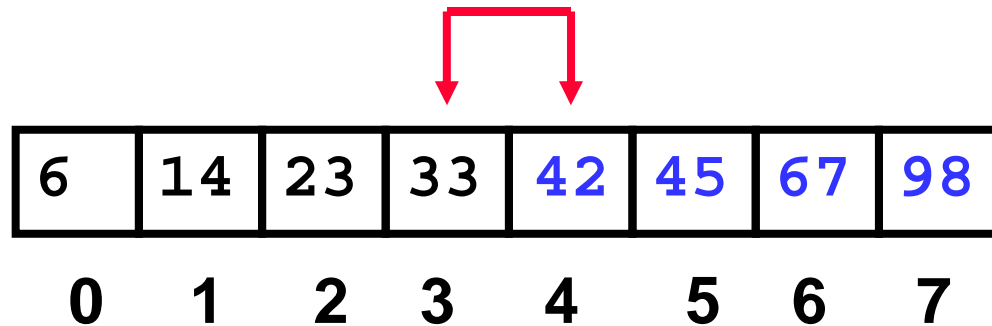
pos_akhir

2

index

3

Finished fifth "Bubble Up"



Finished “Early”

N 8 did_swap **false**
pos_akhir 2
index 3

**We didn't do any swapping,
so all of the other elements
must be correctly placed.**

**We can “skip” the last two
passes of the outer loop.**

6	14	23	33	42	45	67	98
0	1	2	3	4	5	6	7

Algoritma

1. $i \leftarrow N$
2. selama ($i > 0$) kerjakan baris 3 sampai dengan 11
3. $did_swap = false$
4. $j \leftarrow 1$
5. Selama ($j < i$) kerjakan baris 6 sampai dengan 9
6. Jika ($Data[j-1] > Data[j]$) maka kerjakan baris 7 & 8
7. tukar $Data[j-1]$ dengan $Data[j]$
8. $did_swap = true$
9. $j \leftarrow j + 1$
10. Jika $did_swap = false$ keluar dari loop
11. $i \leftarrow i - 1$