Assignment No.: 04

Information and Communication Technology

Submitted To

Pro. Aslan Tariq

Submission By

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Roll No

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QUESTION NO: 01

Search element no 19. Apply Liner and Binary Search on given array.

Array

Index	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Value	1	8	10	14	15	11	13	18	2	4	6	5	19	3	20

LINEAR SEARCH FOR

- ## What is Liner Search?

Linear search is a very simple search algorithm. With this type of search, a sequential search of all items is performed one after another. Each item is checked, and if a match is found, that particular item is returned; otherwise, the search continues until the end of data collection.

Found element = 19;

Value	1	8	10	14	15	11	13	18	2	4	6	5	**19**	3	20
index	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Start from

Array stop on index “12”

So, here we can see that array find the desire aliment in index “12” Found element = 19;

FOR BINARY SEARCH

- # *What is Binary Search?*

Binary search, also known as mid-range search, logarithmic search, or binary cutoff, is a search algorithm that finds the position of a target value within an ordered matrix. The binary search compares the target value with the middle element of the array.

Desire found element = 19;

- *As we can see that, the given array is Unsorted. So, we should sort it.*

Array before sorting

Value	*1*	*8*	*10*	*14*	*15*	*11*	*13*	*18*	*2*	*4*	*6*	*5*	***19***	*3*	*20*

Array after sorting

Value	*1*	*2*	*3*	*4*	*5*	*6*	*8*	*10*	*11*	*13*	*14*	*15*	*18*	***19***	*20*

- *To find the middle element of the array*

Mid = 7;

Value	*1*	*2*	*3*	*4*	*5*	*6*	*8*	***10***	*11*	*13*	*14*	*15*	*18*	***19***	*20*
index	*0*	*1*	*2*	*3*	*4*	*5*	*6*	***7***	*8*	*9*	*10*	*11*	*12*	*13*	*14*

The Smallest Value in this array is “1”

Mid is = 7; Half of the

The highest value is “14” on index “14”

11	13	14	15	18	19	20
8	9	10	11	12	13	14

Smallest index is “8”

Mid is = 11;
Half of the

Highest index is“14”

13	14	15	18	19	20
9	10	11	12	13	14

Smallest index is “9”

Mid is = 11;

Highest index is“14”

Mid is = 12;

14	15	18	19	20
10	11	12	13	14

Smallest index is “10”

Highest index is“14”

Mid is = 12;

15	18	19	20
11	12	13	14

Smallest index is “11”

Highest index is“14”

18	19	20
12	13	14

Smallest index is “12”

Highest index is“14”

END OF QUESTION NO: 01 **02**

Apply Quick, Merge and Bubble Sort on given array.

Array

Index	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Value	1	8	10	14	15	11	13	18	2	4	6	5	19	3	20

- *What is Bubble Sort?*

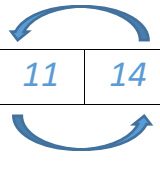
Bubble sort is a simple sorting algorithm. This sorting algorithm is comparison-based algorithm in which each pair of adjacent elements is compared and the elements are swapped if they are not in order.

i. Bubble Sort

Array before sorting

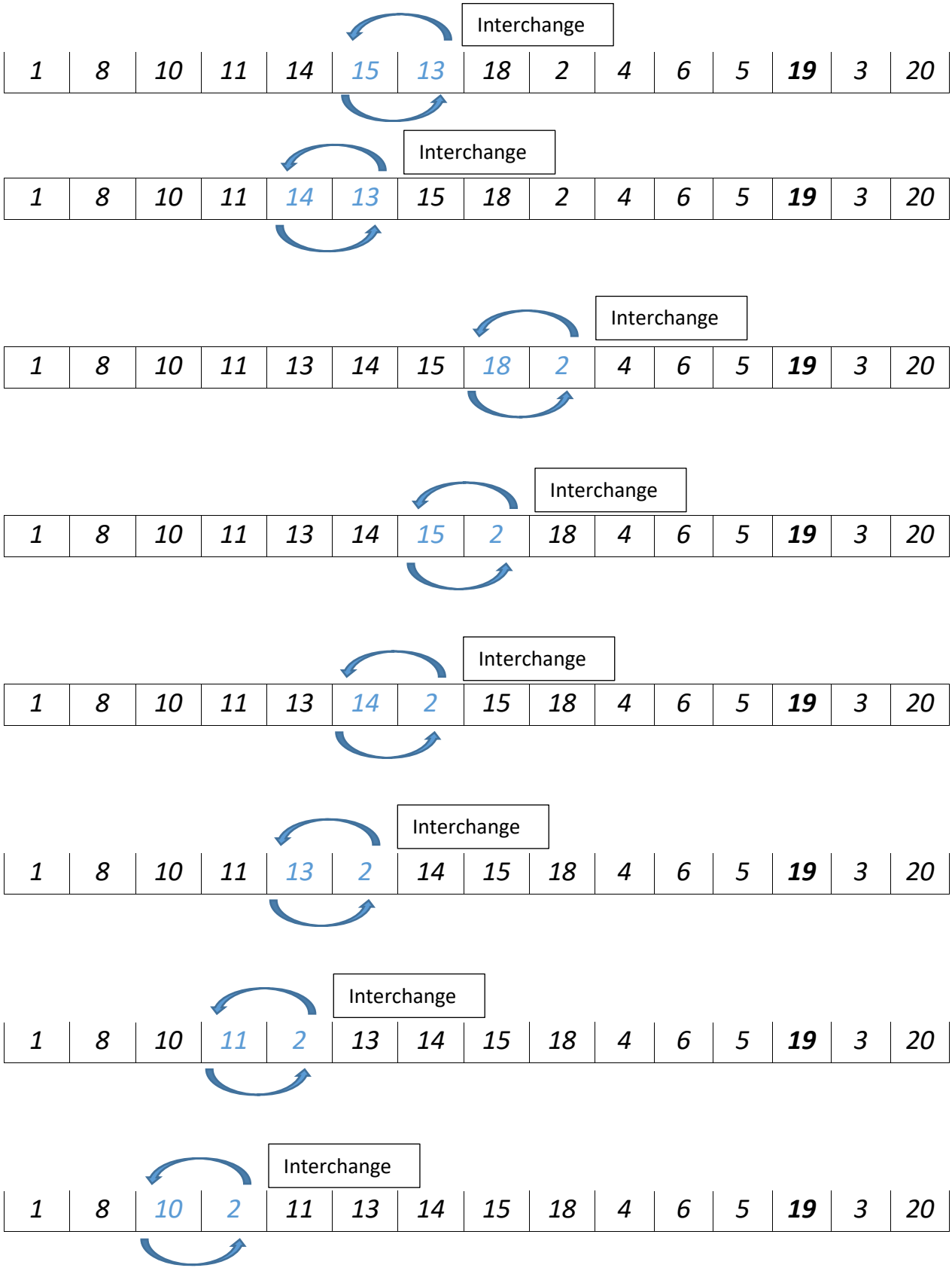
1	8	10	14	15	11	13	18	2	4	6	5	**19**	3	20

Unsorted array



1	8	10	11	14	15	13	18	2	4	6	5	**19**	3	20

Interchange


Interchange
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Interchange
1 8 10 11 14 13 15 18 2 4 6 5 19 3 20
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1 8 10 11 13 14 15 18 2 4 6 5 19 3 20
Interchange
1 8 10 11 13 14 15 2 18 4 6 5 19 3 20
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1 8 10 11 13 14 2 15 18 4 6 5 19 3 20
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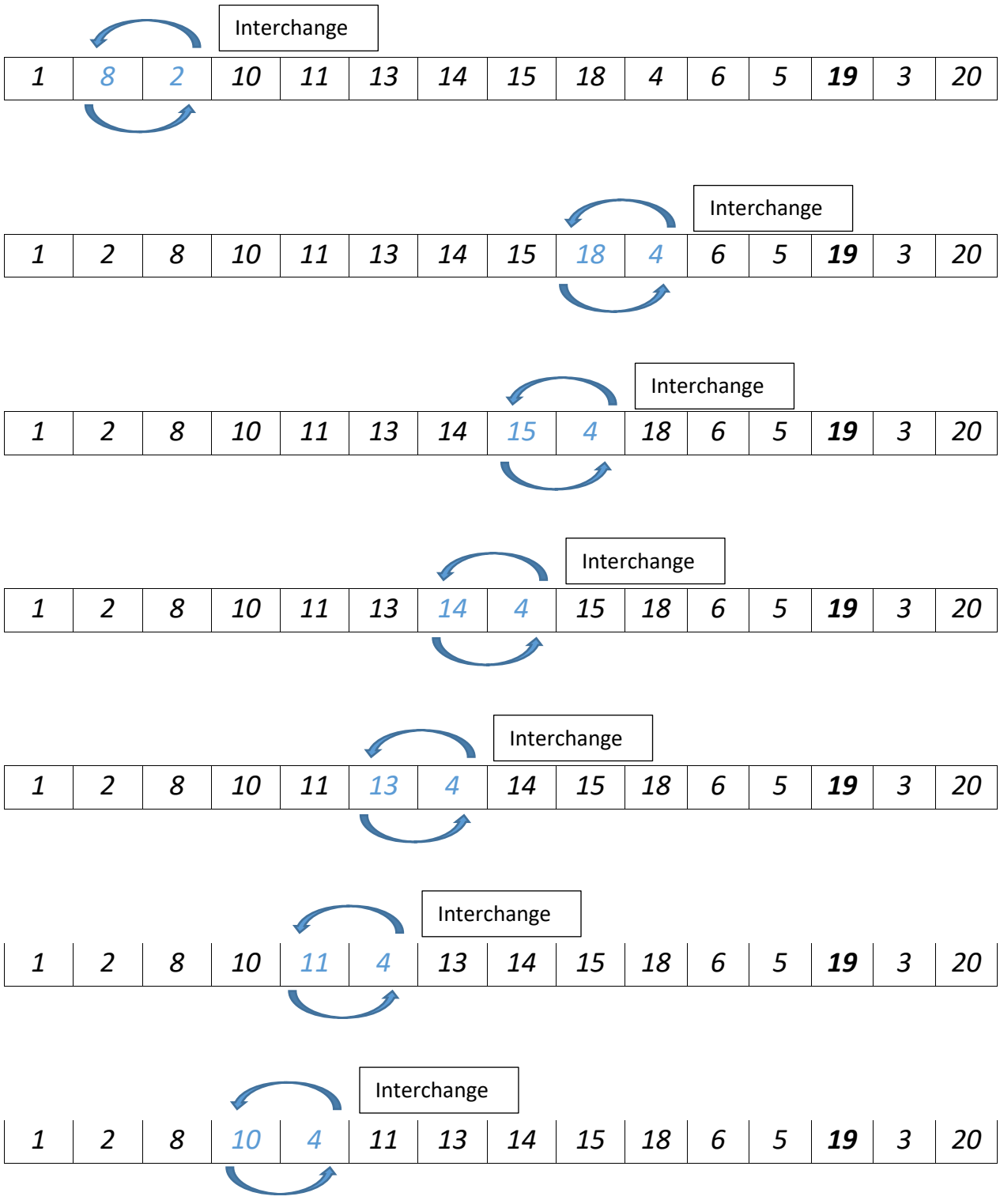
Interchange
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Interchange
1 2 8 10 11 13 14 15 18 4 6 5 19 3 20
Interchange
1 2 8 10 11 13 14 15 4 18 6 5 19 3 20
Interchange
1 2 8 10 11 13 14 4 15 18 6 5 19 3 20
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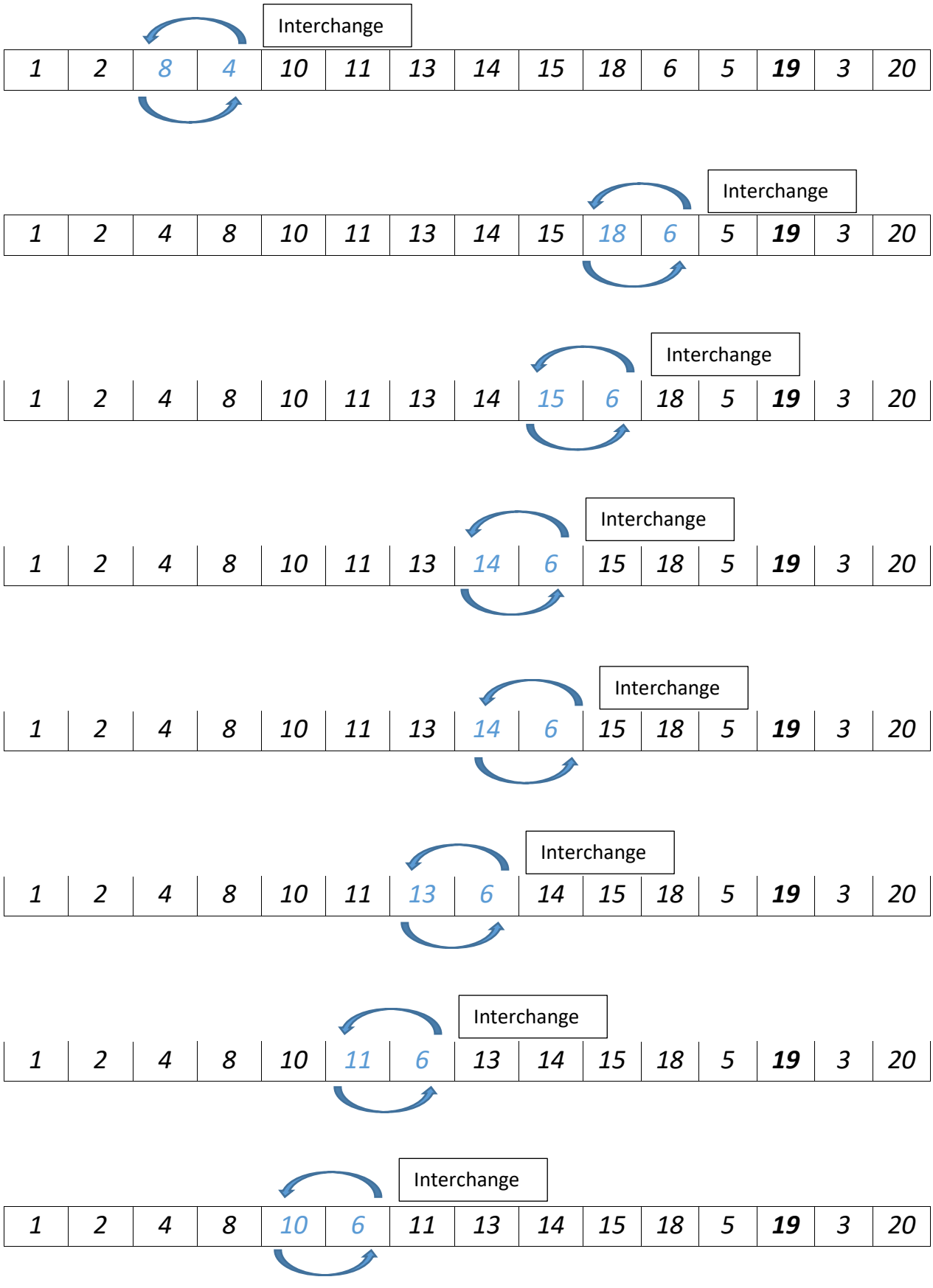
Interchange
1 2 8 10 11 4 13 14 15 18 6 5 19 3 20
Interchange
1 2 8 10 4 11 13 14 15 18 6 5 19 3 20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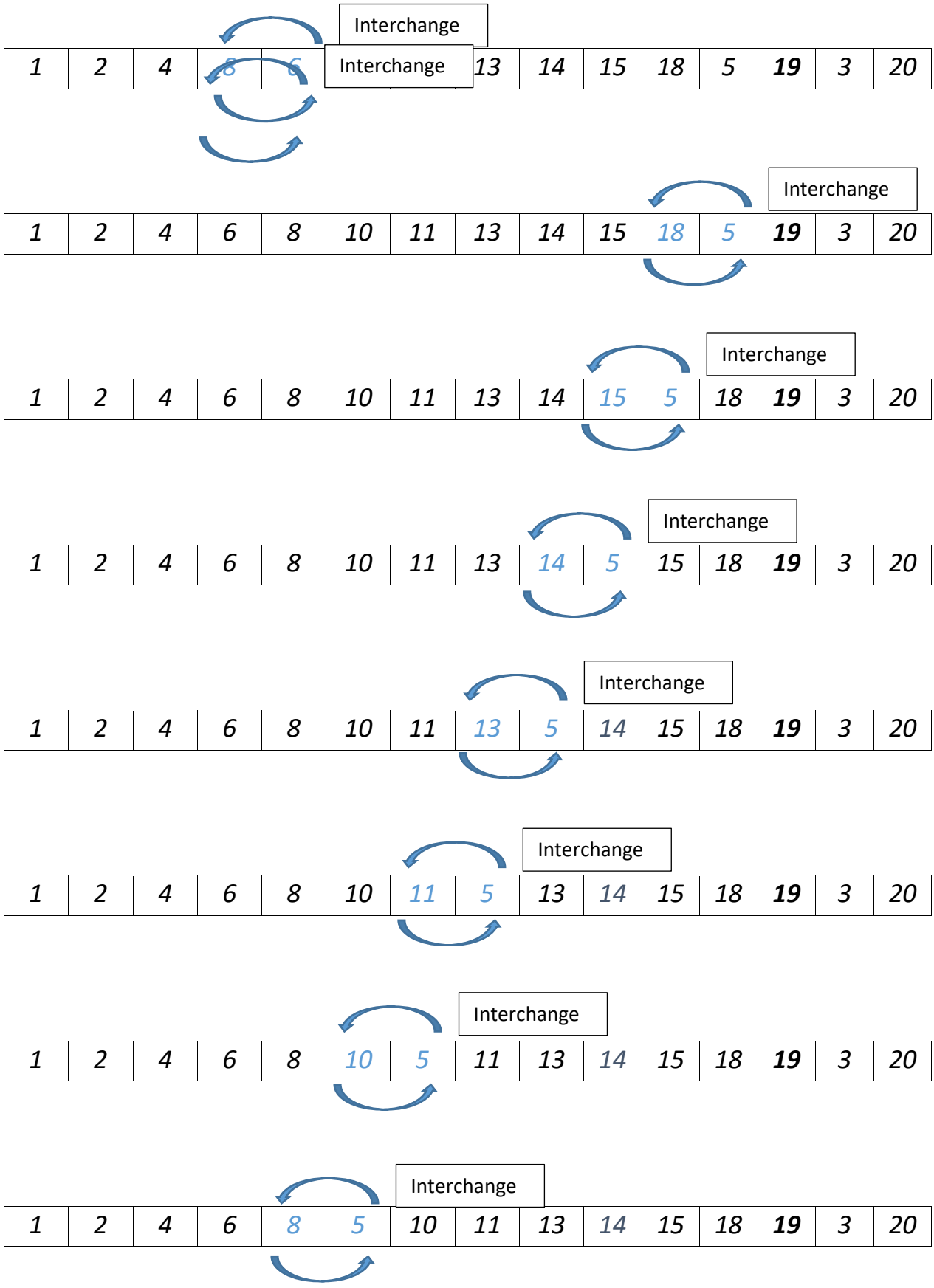
Interchange
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Interchange
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1 2 4 6 8 10 11 13 5 14 15 18 19 3 20
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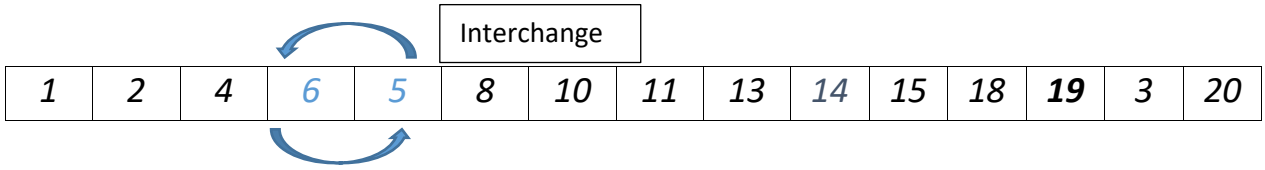
Interchange
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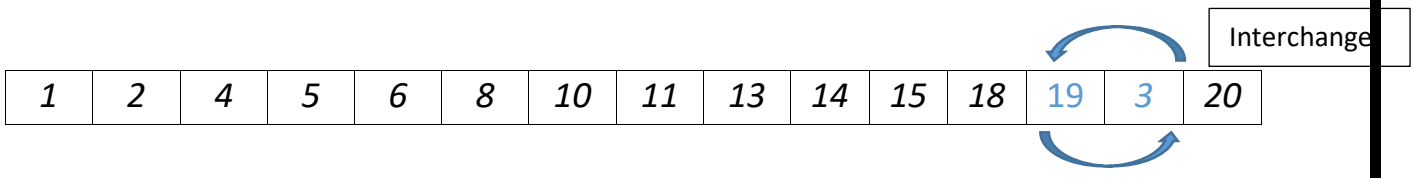
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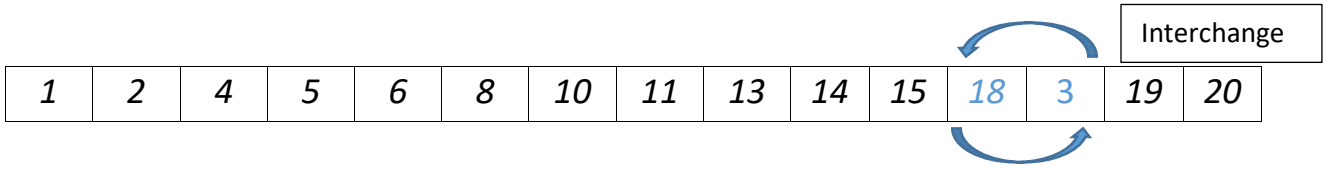
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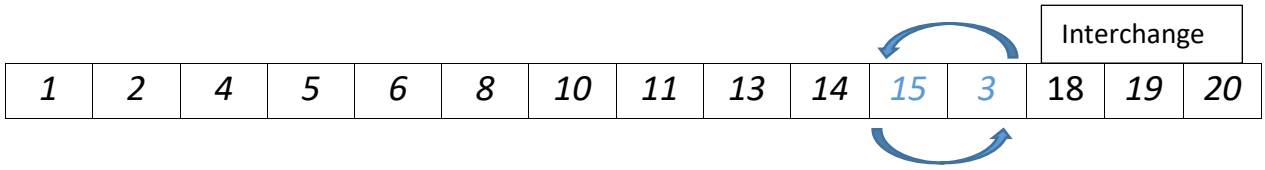
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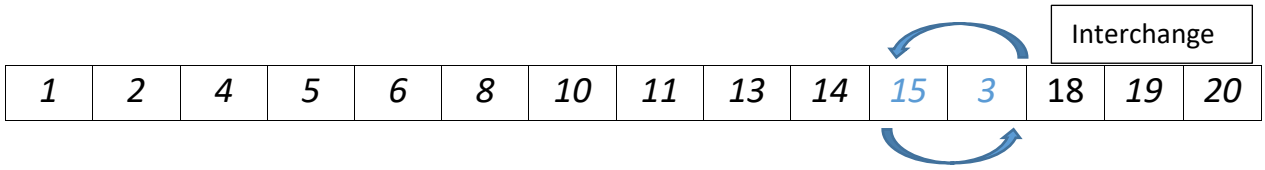
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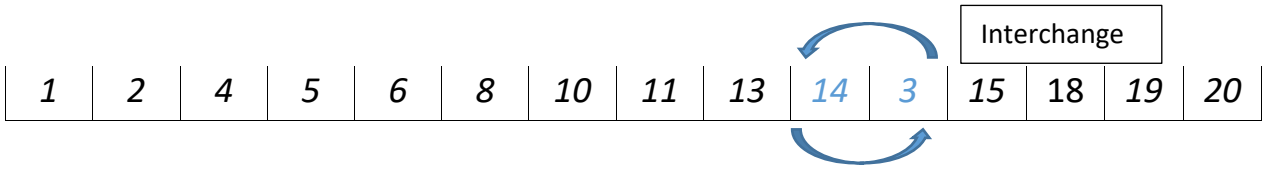
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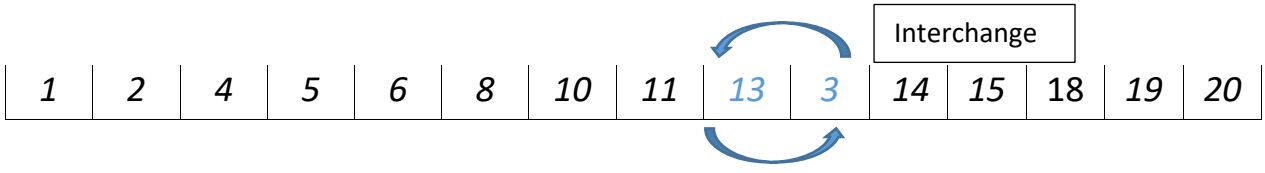
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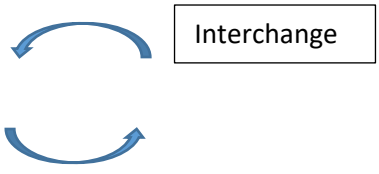
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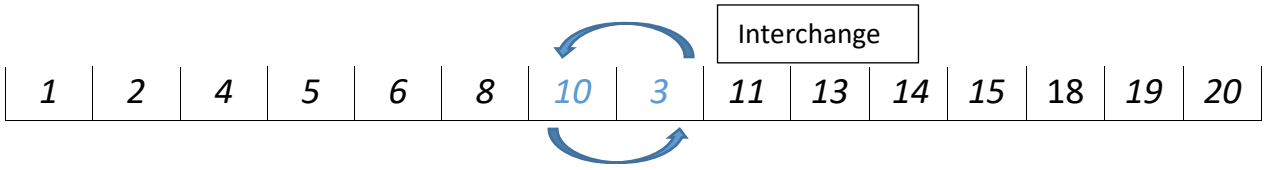
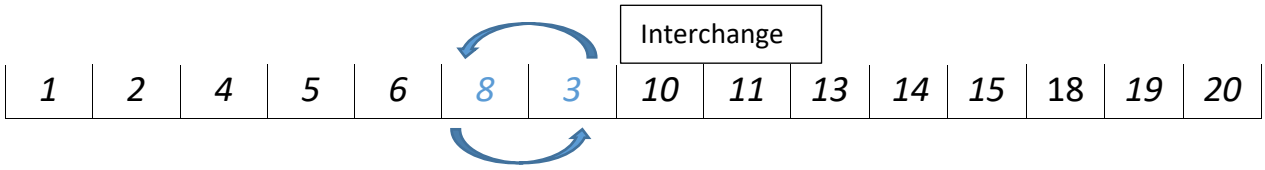
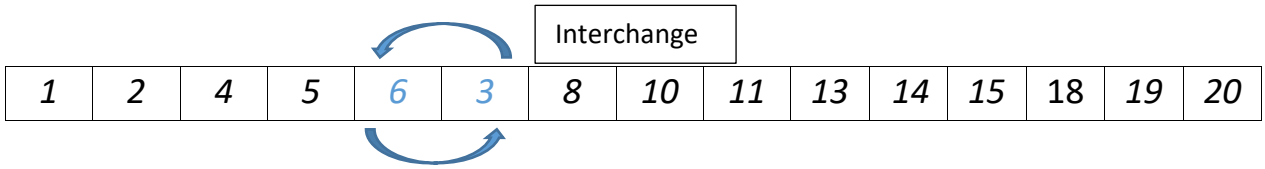
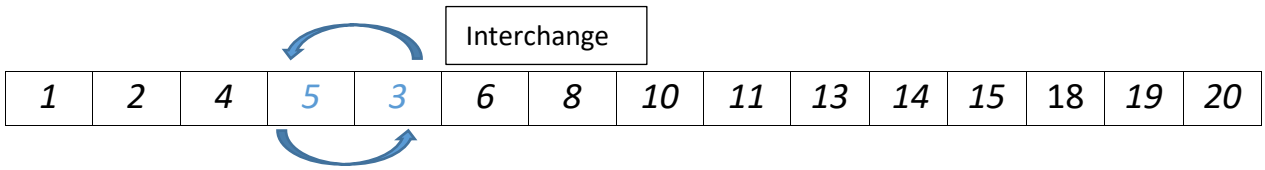
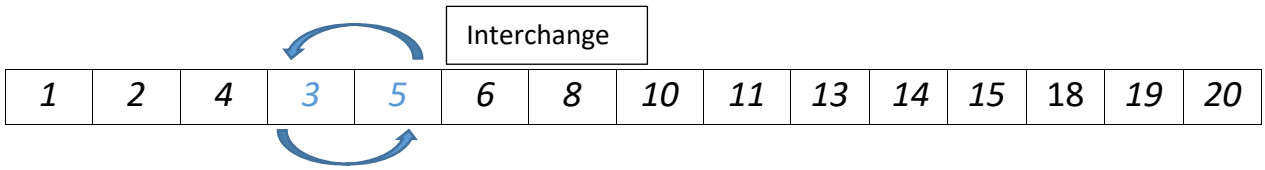










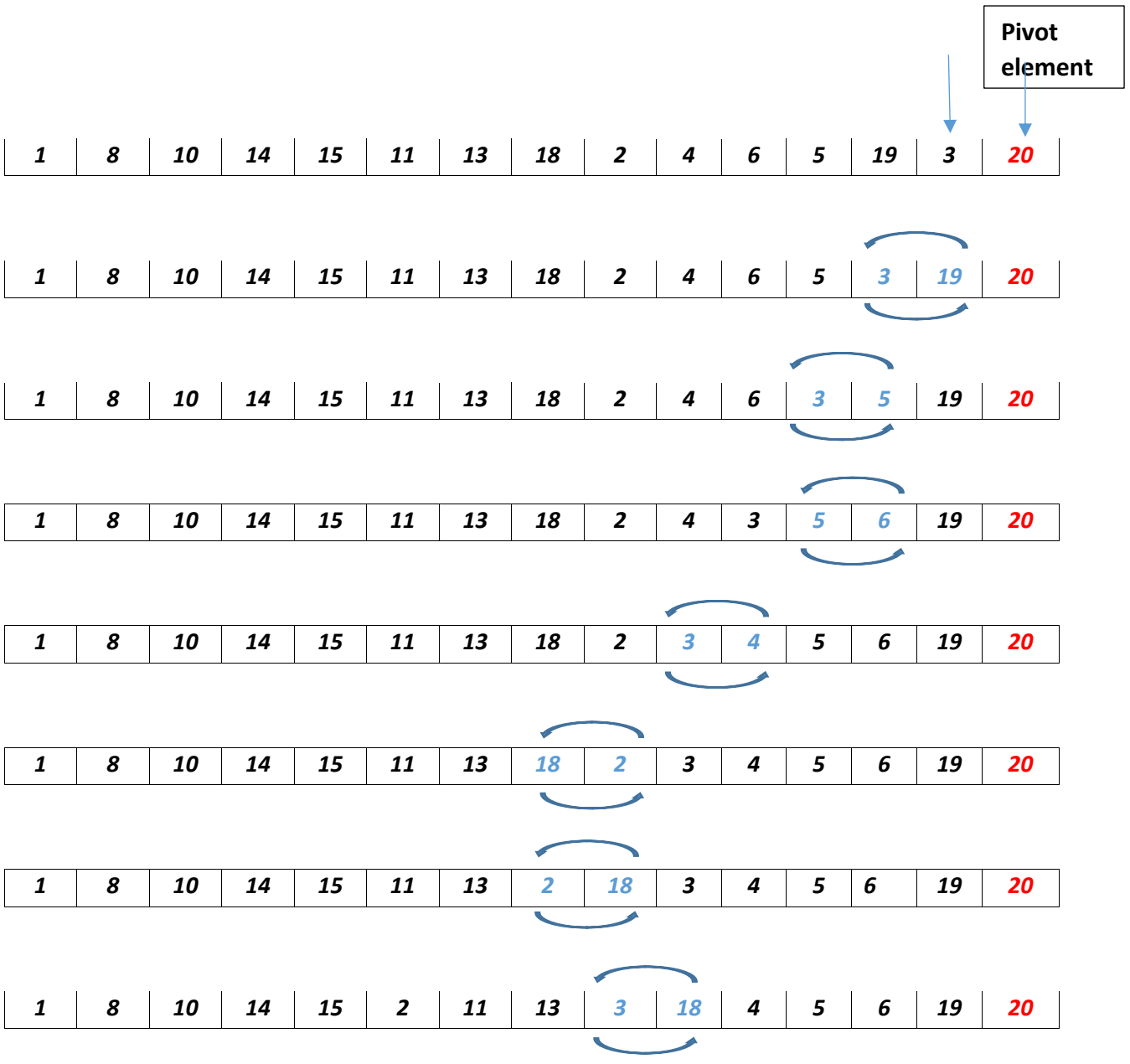
Sorted Array!

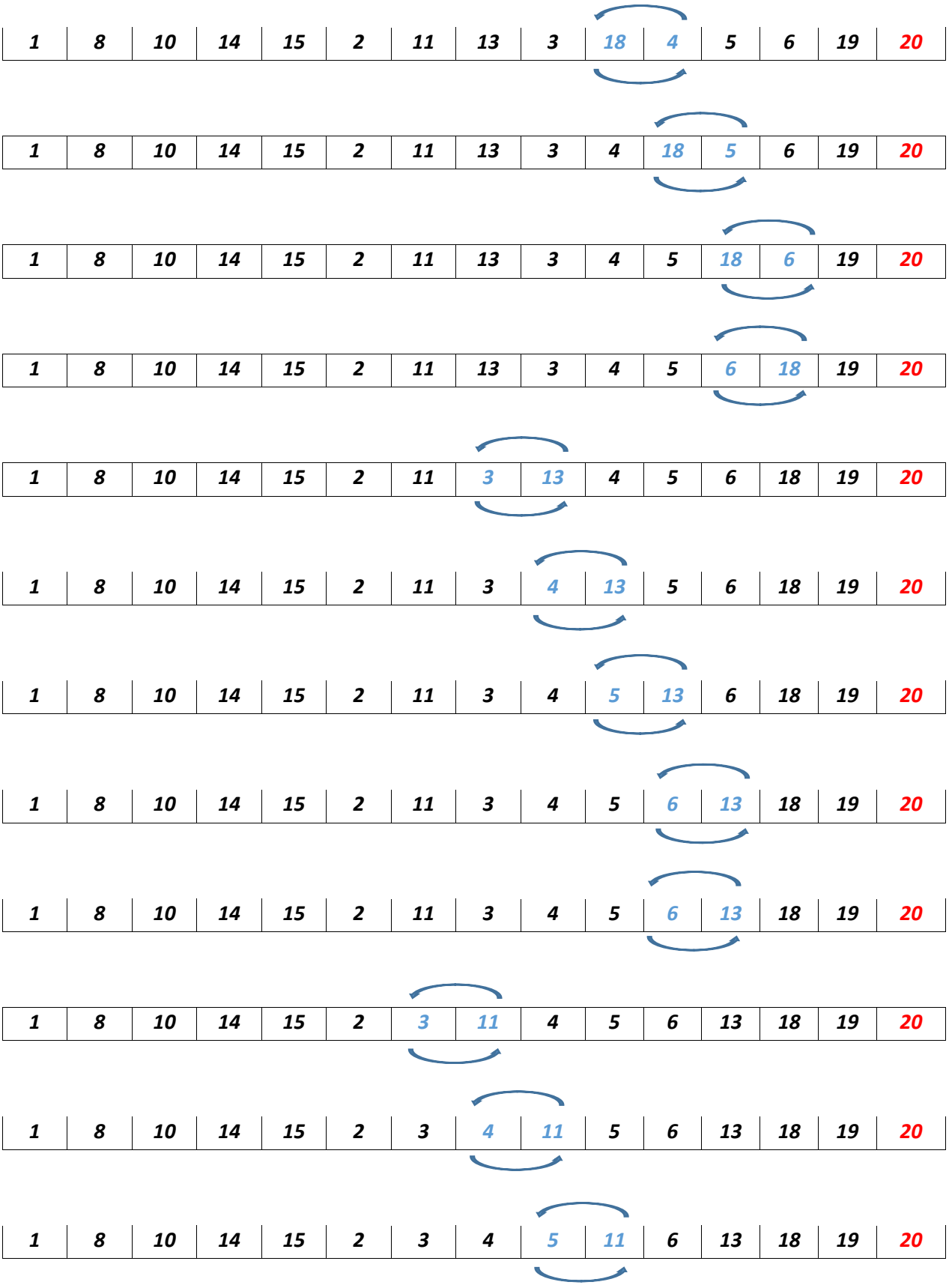
2: Bubble Sort

Apply Quick

Index	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Value	1	8	10	14	15	11	13	18	2	4	6	5	19	3	20

Pivot element

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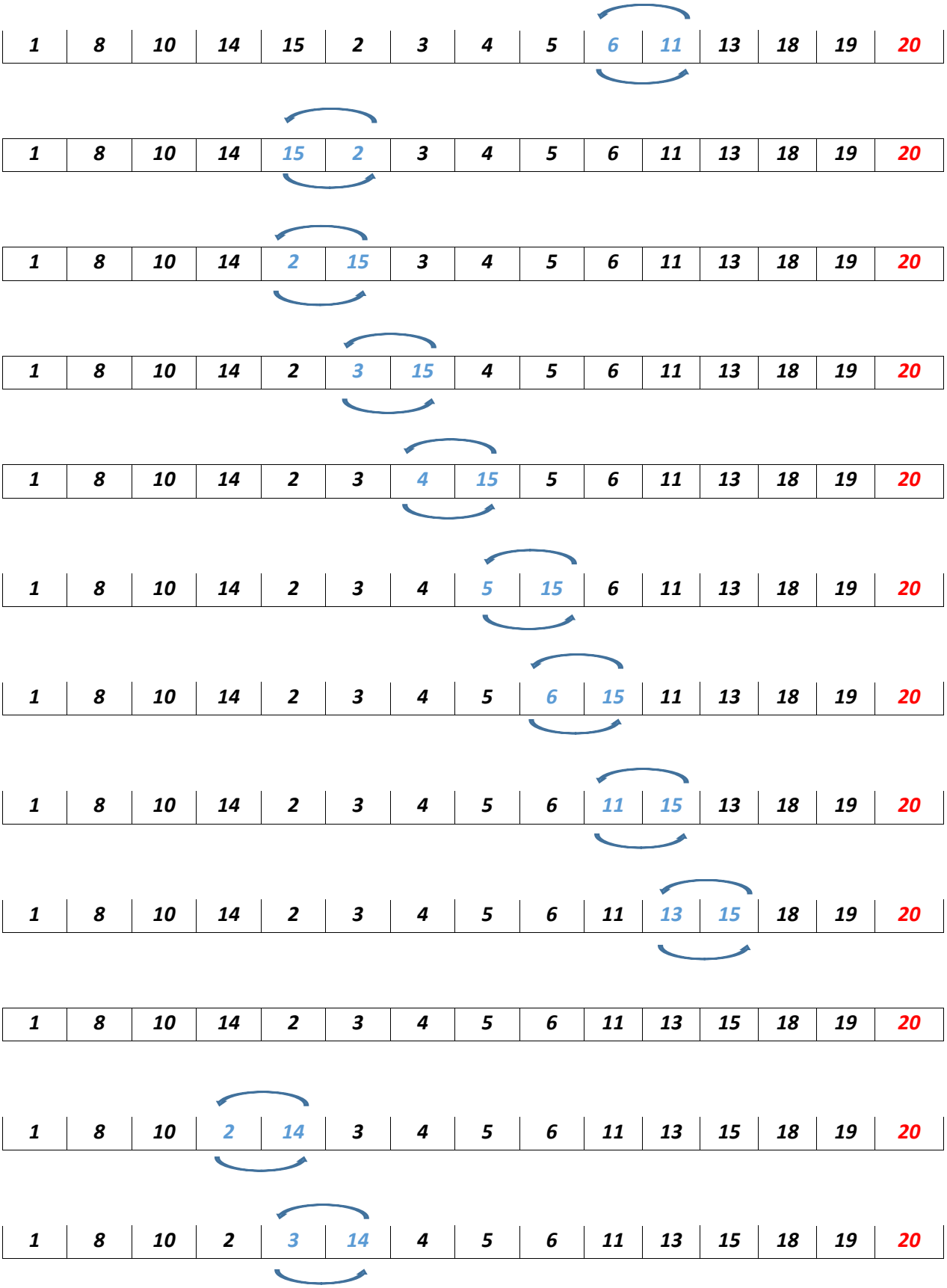
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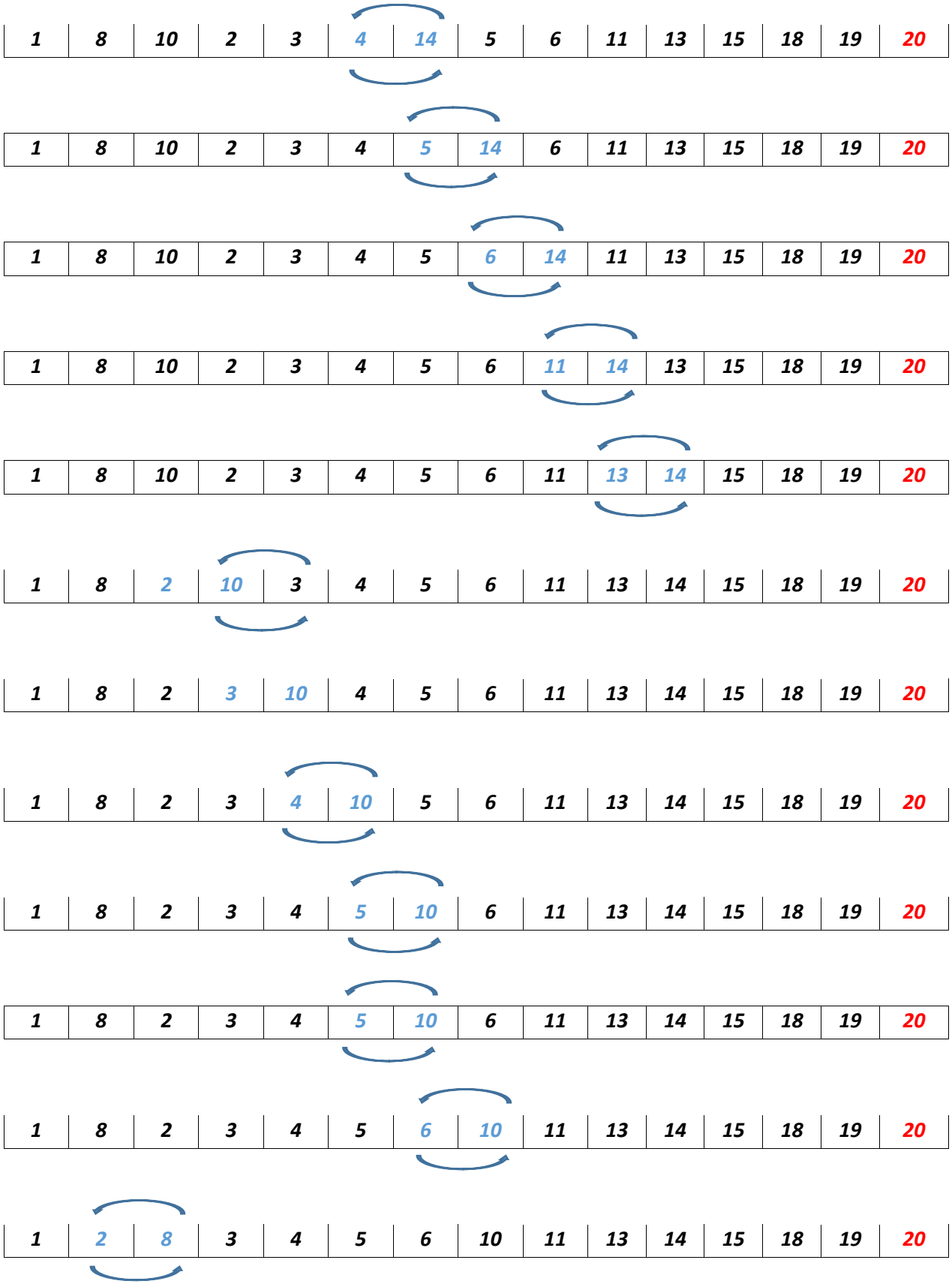
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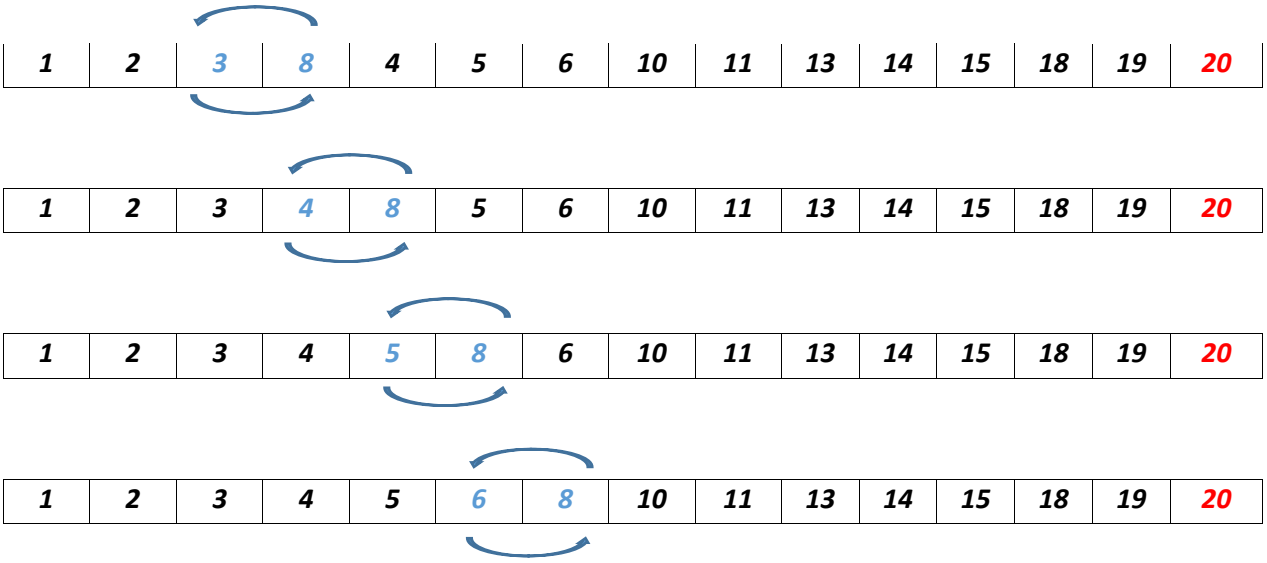
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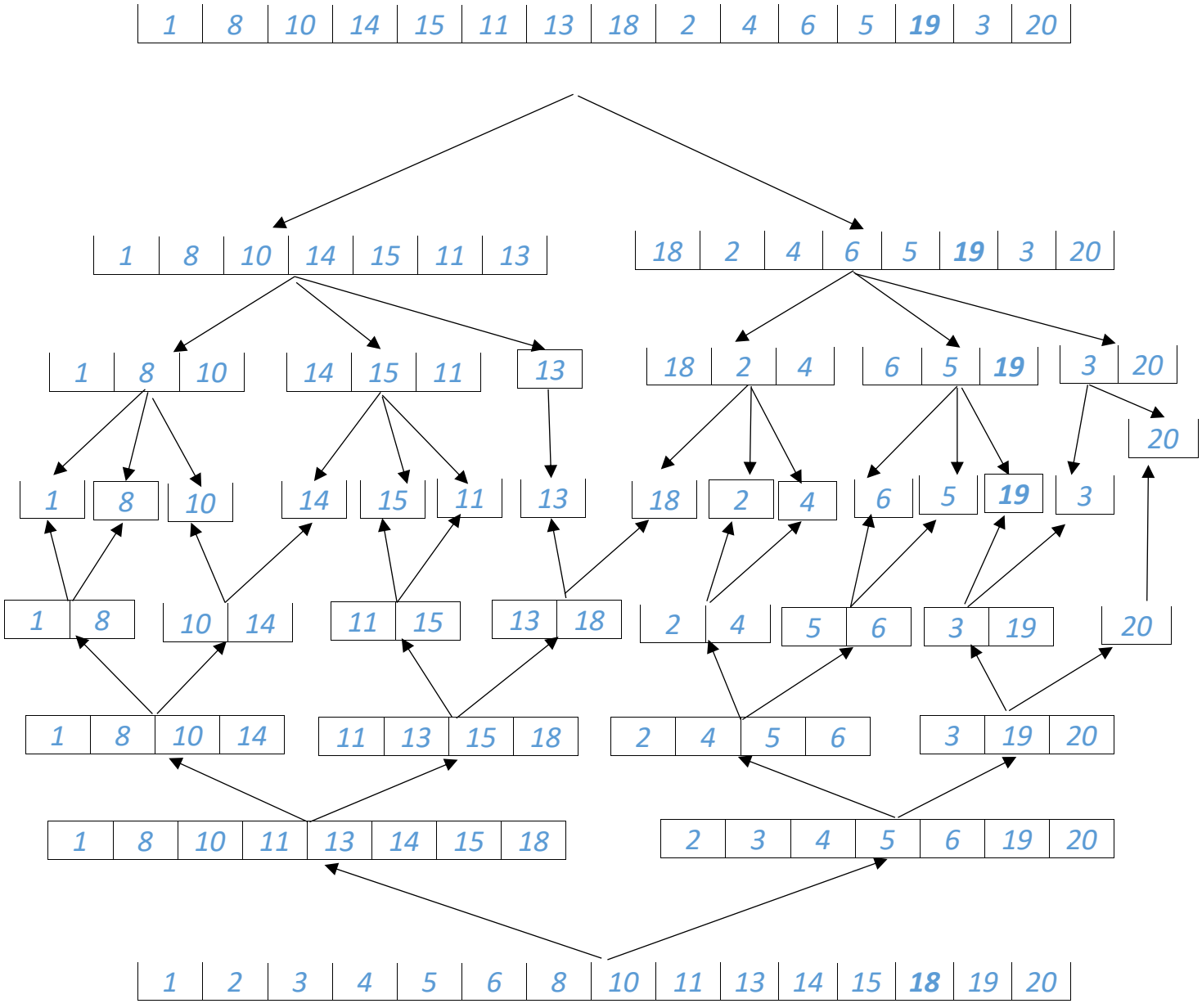
3: Bubble Sort



END OF QUESTION NO: 02

End of the Assignment