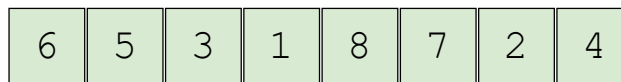


# Introduction to Merge Sort

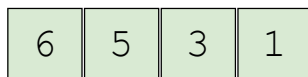
Merge sort sorts lists by breaking them down, sorting them and then merging the sorted lists. (Reading time: under 1 minute)

It divides the given array into halves, calls itself for the two halves, and then merges these halves.



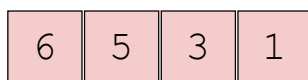
Unsorted array

1 of 58



Split into half

2 of 58



Split left array into half

3 of 58

6	5
---	---

3	1
---	---

8	7	2	4
---	---	---	---

Split left array into half

4 of 58

6	5
---	---

3	1
---	---

8	7	2	4
---	---	---	---

Split left array into half

5 of 58

6	5
---	---

3	1
---	---

8	7
---	---

2	4
---	---

Split left array into half

6 of 58

6	5
---	---

3	1
---	---

8	7
---	---

2	4
---	---

Split [6, 5]

7 of 58



Split [6, 5]

8 of 58



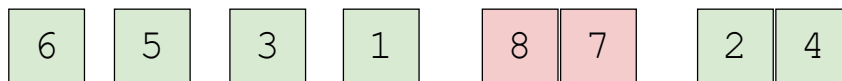
Split [3, 1]

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Split [3, 1]

10 of 58



Split [8, 7]

11 of 58

6 5 3 1 8 7 2 4

Split [8, 7]

12 of 58

6 5 3 1 8 7 2 4

Split [2, 4]

13 of 58

6 5 3 1 8 7 2 4

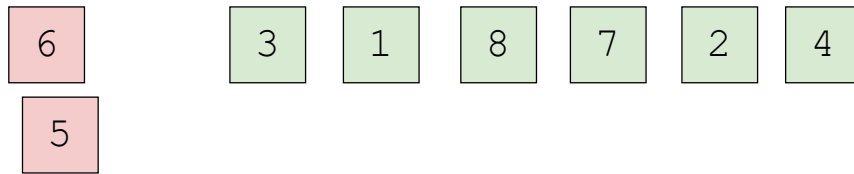
Split [2, 4]

14 of 58

6 5 3 1 8 7 2 4

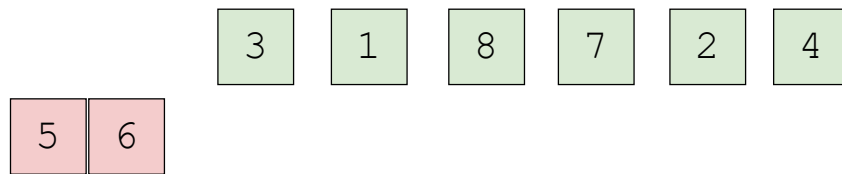
6 > 5

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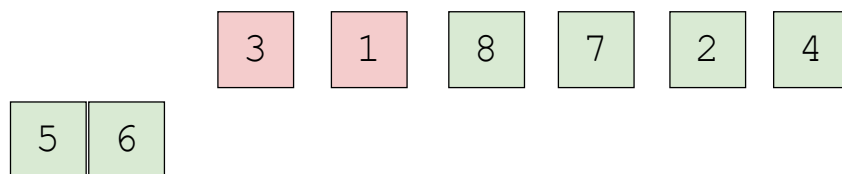
Swap!

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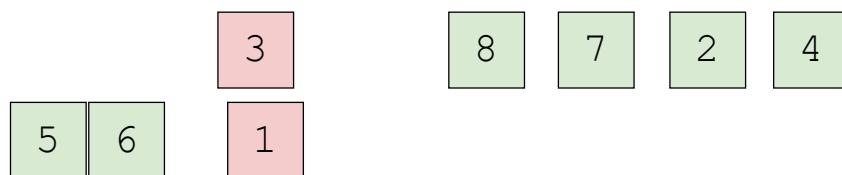
Swap!

17 of 58



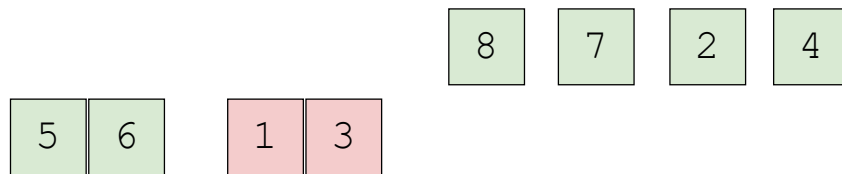
$3 > 1$

18 of 58



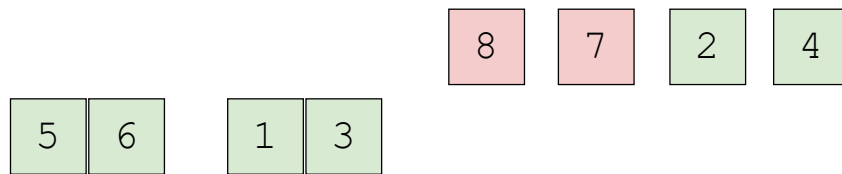
Swap!

19 of 58



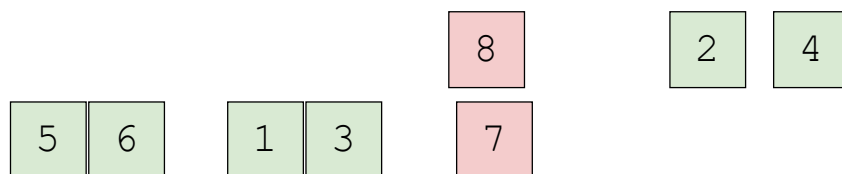
Swap!

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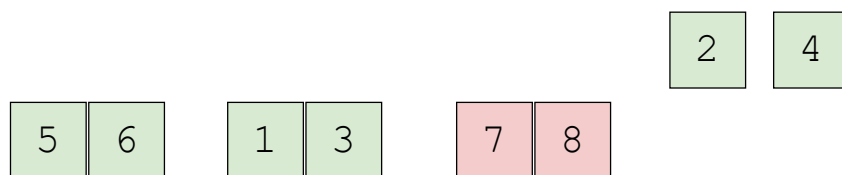
8>7

21 of 58



Swap!

22 of 58



Swap!

23 of 58

5 6

1 3

7 8

2

4

$2 < 4$

24 of 58

5 6

1 3

7 8

2

4

Do not swap!

25 of 58

5 6

1 3

7 8

2 4

Do not swap!

26 of 58

5 6

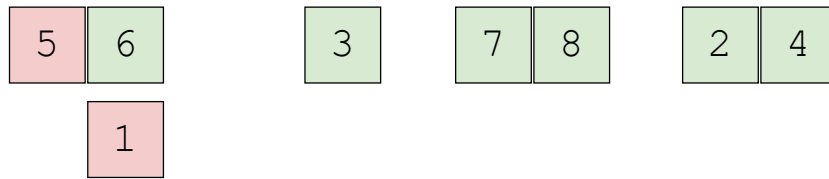
1 3

7 8

2 4

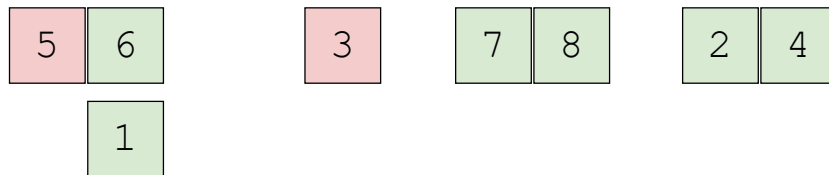
$1 < 5$

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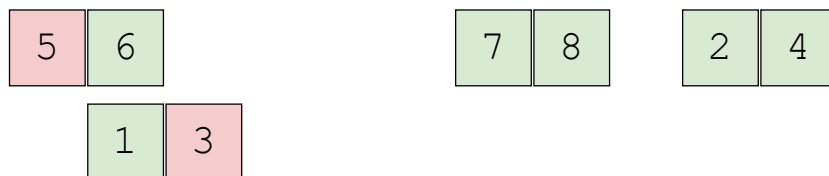
1<5

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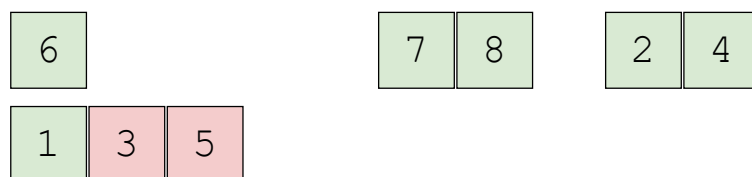
3<5

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3<5

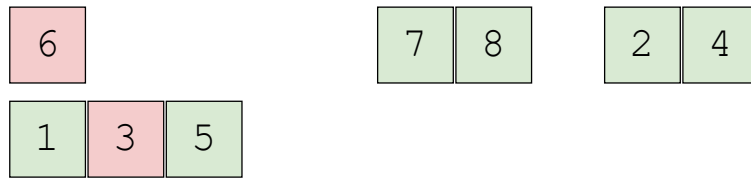
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3<5

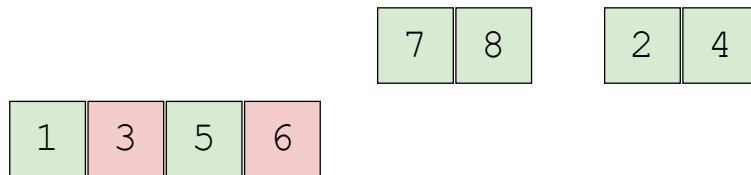
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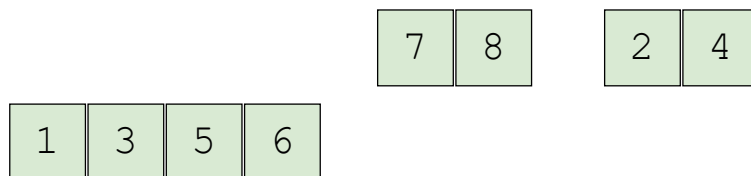
3<6

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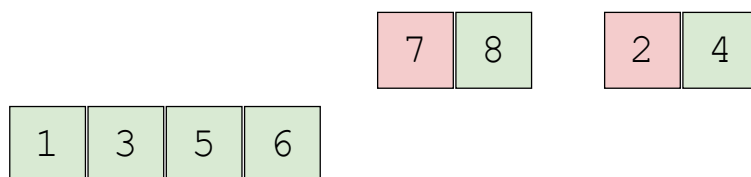
3<6

33 of 58



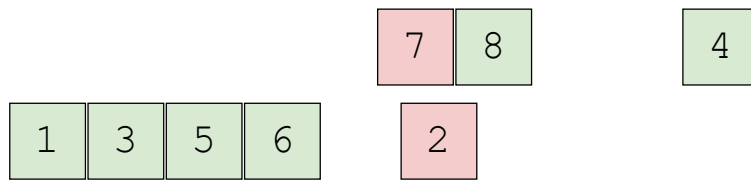
Left half of the array has been sorted.

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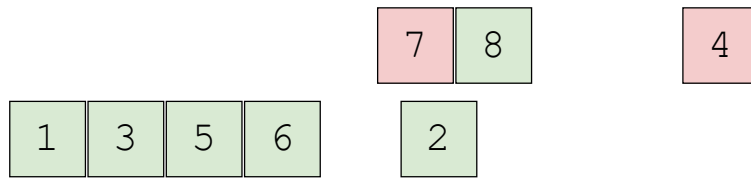
2<7

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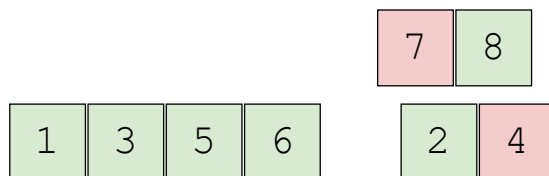
$$2 < 7$$

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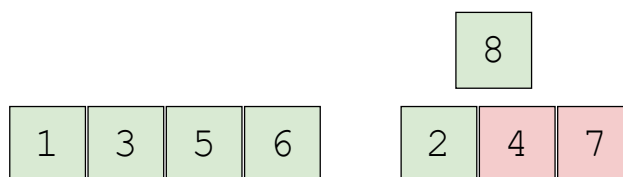
$$4 < 7$$

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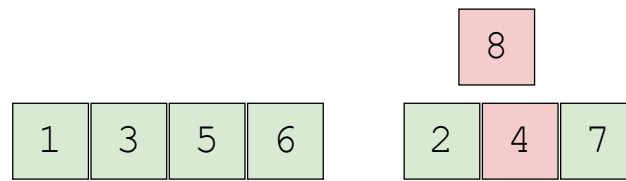
$$4 < 7$$

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$$4 < 7$$

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4<8

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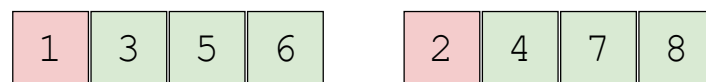
4<8

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Right half of the array has been sorted.

42 of 58



1<2

43 of 58

1

3 5 6

2 4 7 8

1<2

44 of 58

1

3 5 6

2 4 7 8

2<3

45 of 58

1 2

3 5 6

4 7 8

2<3

46 of 58

1 2

3 5 6

4 7 8

3<4

47 of 58

1 2 3

5 6

4 7 8

3<4

48 of 58

1 2 3

5 6

4 7 8

4<5

49 of 58

1 2 3 4

5 6

7 8

4<5

50 of 58

1 2 3 4

5 6

7 8

5<7

51 of 58

1 2 3 4 5

6

7 8

5<7

52 of 58

1 2 3 4 5

6

7 8

6<7

53 of 58

1 2 3 4 5 6

7 8

6<7

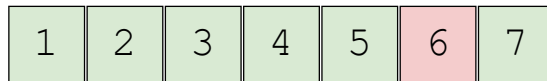
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1 2 3 4 5 6 7

8

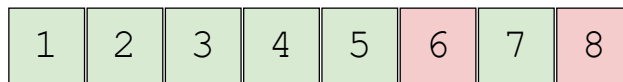
6<7

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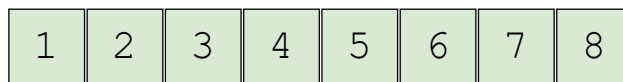
6<8

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6<8

57 of 58



Sorted Array!

58 of 58

—

[ ]

In the next lesson, I will discuss the working of this algorithm in a little more detail along with its code implementation.